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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

**Proposal for a Regulation of the European Parliament and of the Council
establishing a framework for setting ecodesign requirements for sustainable products
and repealing Directive 2009/125/EC**

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1. INTRODUCTION

This impact assessment considers the framework for improving the sustainability of products on the European market. It assesses the need for, and possible means of implementing, the sustainable product policy legislative initiative announced in last year's Circular Economy Action Plan¹ which, for the purpose of this impact assessment, will be referred to as the **Sustainable Products Initiative (SPI)**.

As the analysis explores, at this initiative's core is a possible revision of the Ecodesign Directive (ED)², which currently covers energy-related products only. This impact assessment considers the additional products to which the Ecodesign Directive could usefully be extended³, how its provisions should best be reinforced and how its application could be adapted to ensure effectiveness. It also examines ways in which sustainable product choices, by consumers and public authorities, could be incentivised. In its essence, this impact assessment seeks to identify a series of priorities and tools for improving the sustainability of products placed on the EU market, as well as for ensuring that the future legislative framework allows work to be efficiently undertaken. Given the range of products that could eventually be targeted, many of the more specific product rules will be laid down in a second stage, via SPI measures⁴ supported by impact assessments and stakeholder consultation, and underpinned by a prioritisation exercise that will identify the order in which to tackle the different products.

1.1. POLITICAL CONTEXT

Europe is facing the interlinked and cascading effects of climate change, biodiversity loss, and pollution – a triple planetary crisis. Developing a circular economy will contribute positively to the fight against all three. An essential objective of the circular economy is to drive Europe's internal market towards production and consumption of more sustainable products, reducing environmental and social pressures while retaining value.

This objective is reflected in the **European Green Deal**⁵, Europe's growth strategy to transform the EU into a fairer and more prosperous society, with a modern, competitive, climate neutral and circular economy. It recognises the advantages of investing in our competitive sustainability by building a fairer, greener and more digital Europe. This also entails engaging third countries and trading partners to ensure the sustainability of global value chains and ensuring that European emission reductions contribute to a global emissions decline, instead of pushing carbon-intensive production outside Europe. This will benefit citizens, providing them with high-quality products that are efficient and affordable, last longer and are better for the environment. The **European Industrial Strategy**⁶ also clearly recognizes that Europe's industry must play a leading role in this transformation, reduce its carbon and material footprint and embed circularity across the economy.

The **Circular Economy Action Plan**⁷ (CEAP) sets out what more needs to be done to speed up the transformation. It announces a sustainable product policy legislative initiative to make products fit for a climate neutral, resource efficient and circular economy, reduce waste and ensure that the performance of frontrunners in sustainability progressively becomes the norm – in particular via a

¹ COM/2020/98 final

² Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products

³ This assessment excludes food and feed as defined in the General Food Law (Regulation EC 178/2002), as well as raw materials as final products – all of which are to be considered outside the scope of the SPI impact assessment.

⁴ The impact assessment report uses the term "SPI measures" to describe the secondary legislation to be adopted on the basis of the SPI basic act. Such SPI measures could be either implementing or delegated acts. To be decided when finalising the legal proposal.

⁵ COM (2019) 640

⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593086905382&uri=CELEX%3A52020DC0102>

⁷ COM/2020/98 final

revision and extension of the current Ecodesign Directive⁸ to a wide range of products. The European Parliament and the Council strongly support these efforts to improve the sustainability of products in Europe^{9, 10}.

Eurobarometer surveys¹¹ show that the public supports action: they suggest the most effective ways of tackling environmental problems are to ‘change the way we consume’ as well as to ‘change the way we produce and trade’; with responsibility shared by businesses, governments and the EU, as well as citizens themselves.

At international level, the EU has also committed to the implementation of the **UN 2030 Agenda for Sustainable Development**, including its **17 Sustainable Development Goals (SDG)**. While a 2021 report¹² found that the EU has recently achieved moderate progress towards **SDG 12**, ‘*Ensure sustainable consumption and production patterns*’, it also highlighted that absolute decoupling of both energy and material use has not been achieved by the EU, that waste generation has been increasing, and that average CO₂ emissions from new cars are not falling fast enough to meet targets – all suggesting much work remains to be done.

The CEAP emphasises that the EU cannot deliver alone the ambition of the European Green Deal for a climate-neutral, resource-efficient and circular economy. Therefore, SPI will contribute to EU efforts to lead the way to a circular economy at the global level¹³. It should be seen as a **key instrument** for achieving EU climate goals: it will synergize with and complement instruments with more direct climate focus¹⁴ by going beyond the production of basic materials/basic material components to cover **final products** themselves. This will allow for taking action on negative impacts generated along the entire life-cycle and value chain of a product – not only e.g. direct emissions generated during a product’s use phase, but also embedded emissions of a product throughout its lifecycle, or other negative consequences (e.g. on resource depletion; land use; ozone depletion etc.). This will directly support Green Deal objectives, by fostering the environmental optimisation of value chain management through footprint reduction.

1.2. LEGAL CONTEXT

Article 3.3 of the Treaty on the European Union (TEU) states that “The Union shall [...] work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment.”.

The EU’s existing product policy framework¹⁵ only partially addresses the sustainability aspects of products. The Ecodesign Directive regulates energy efficiency, environmental impacts and some circularity features of energy-related products, with a focus on product design requirements. Whilst the Ecodesign Directive is recognised¹⁶ as having contributed to significant efficiency gains for energy-related products since it was first adopted, it is one of the only existing pieces of legislation

⁸ Directive 2009/125/EC establishing a framework for the setting of eco-design requirements for energy-related products

⁹ See for example https://www.europarl.europa.eu/doceo/document/TA-9-2020-0318_EN.html ; https://www.consilium.europa.eu/media/47583/st_13852_2020_init_en-1.pdf, as well as Annex 5.

¹⁰ It should also be noted that the new [EU Strategy on Adaptation to Climate Change](#) calls for improving water efficiency and reuse by raising the requirements for products subject to eco-design and energy labelling.

¹¹ <https://europa.eu/eurobarometer/surveys/detail/2257>

¹² [Monitoring report on progress towards the SDGs in an EU context, 2021 edition](#), <https://ec.europa.eu/eurostat/documents/3217494/12878705/KS-03-21-096-EN-N.pdf/8f9812e6-1aaa-7823-928f-03d8dd74df4f?t=1623741433852>

¹³ In line with the Commission Staff Working Document “Leading the way to a global circular economy: state of play and outlook”. [SWD\(2020\) 100](#)

¹⁴ Such as those included in the recently adopted [Fit for 55 package](#), in particular the EU Emissions Trading System (ETS) and the Carbon Border Adjustment Mechanism

¹⁵ For an overview of the EU product policy framework and its contribution to circular economy, see [SWD \(2019\) 91: Sustainable Products in a Circular Economy](#)

¹⁶ In particular with regard to energy efficiency. See, e.g. [Energy Efficiency Policies around the World: Review and Evaluation](#), p. 48, World Energy Council 2008.

focused on fostering the sustainability of a specific product group. As evidenced in the CEAP, the European Commission recognises that to deliver its Green Deal commitments, it should replicate the successful approach of the Ecodesign Directive for other product groups: the scope of the Ecodesign Directive thus needs to be widened, and its provisions reinforced to further emphasise the need for circular product design and a holistic, whole life-cycle approach to product regulation.

From an internal market point of view, as there is currently no legislation at EU level that addresses in full the sustainability aspects of products (as mentioned above), creating a regulatory framework to gradually introduce sustainability requirements for more products will help avoid potential regulatory barriers between Member States.

As for existing and emerging EU legislation covering products that would be in scope of SPI, the SPI regulatory framework will ensure consistency and complementarity with them, in a similar manner to how this takes place under the current Ecodesign framework. A number of sections throughout this impact assessment, including the following section and in particular Annex 14, provide further details on how SPI would interact with other related existing and emerging initiatives.

1.3. COHERENCE WITH OTHER RELATED INITIATIVES

Due to its wide scope, both in terms of product coverage and type of legal requirements, SPI is intended to work in synergy with other initiatives announced in the CEAP or implementing the European Green Deal. These include, but are not limited to:

- the initiative on Empowering Consumers for the Green Transition¹⁷ which, in particular, will improve information at the point of sale on the durability and reparability of products and provide better consumer protection against misleading practices in relation to sustainable purchases;
- the Green Claims Initiative¹⁸, on the substantiation of environmental claims, which aims at reducing the risk of greenwashing and at providing reliable, comparable and verifiable information that enables buyers to make more sustainable decisions, in particular by strengthening and harmonising the framework for establishing in a reliable and comparable manner the environmental performance of products;
- the revision of the Construction Products Regulation;
- the revision of the Packaging and Packaging Waste Directive;
- EU Strategy for Sustainable Textiles;
- the Sustainable Corporate Governance initiative, as regards the possibility of requirements of due diligence on value chains;
- Proposal for a Batteries Regulation;
- the Circular Electronics Initiative;
- the Chemicals Strategy for Sustainability;
- the Right to Repair Initiative;

¹⁷ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12467-Consumer-policy-strengthening-the-role-of-consumers-in-the-green-transition_en

¹⁸ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12511-Environmental-performance-of-products-&-businesses-substantiating-claims_en

- the revision of the Industrial Emissions Directive;
- Proposal to reduce the release of microplastics in the environment and to restrict the addition of microplastics to product.

Together, these initiatives will help to foster a key objective of the CEAP and European Green Deal – namely to ensure that all products placed on the EU market become increasingly sustainable (*see also section 7.9 and Annex 14 for further details*).

2. PROBLEM DEFINITION

The main problem is that **consumption and production are not sustainable and not adequately addressed by existing EU product and internal market rules, leading to increasingly divergent national rules on the sustainability of products.**

Sustainable production and consumption¹⁹ encompasses²⁰:

- minimal use of natural resources and toxic materials during production and use;
- minimal pollution, including GHGs emissions, and minimal generation of waste over the product’s life cycle;
- design allowing for products to be kept in use for as long as possible;
- not negatively impacting on quality of life and human dignity (i.e. impacts on health, deterioration of social conditions, violation of human rights, including labour rights);
- minimal compromise of a product’s functionality and safety as a result of the above.

The above criteria provide a broad, working-level concept of sustainability – encompassing **environmental, social and economic** dimensions – for the purposes of this impact assessment. It follows that all of these dimensions should to be considered and addressed in a proportionate way when addressing the sustainability levels of a given product.²¹

Box 1: Problem Context

(For further details on the below, please see Annex 7: Problem Definition, section *What is/are the main problem(s)?*)

While some products in the EU meet the criteria set out at the beginning of this section, many products do not. An examination of the wider context of this problem shows that:

- 1) resources are being used too inefficiently;**
- 2) some environmental impacts of the consumption of an average EU citizen are outside the safe operating space for humanity²²;**
- 3) the EU economy remains largely ‘linear’ by design²³;**

¹⁹ Consumption includes the use phase of products

²⁰ See for example: <https://sustainabledevelopment.un.org/topics/sustainableconsumptionandproduction>

²¹ This is without prejudice to the full set of criteria that will be used to select, prioritise and set requirements for the products to be regulated under the future SPI – which will nevertheless be required to take the environmental, social and economic dimensions firmly into account. Please see Annex 16 for further details.

²² Sala, S. and Sanye Mengual, E., Consumption Footprint: assessing the environmental impacts of EU consumption, European Commission, 2022, JRC126257, <https://publications.jrc.ec.europa.eu/repository/handle/JRC126257>.

4) and production is sometimes taking place in **poor social conditions**²⁴.

5) As a result of the above, attempts to improve the sustainability performance of products are being pursued individually by some Member States, leading to increasingly **divergent national approaches**.

1) Resources use: According to latest UN projections, the global population is expected to grow to around 9.7 billion in 2050, meaning the equivalent of almost three planets would be required to provide the natural resources needed to sustain current lifestyles²⁵. Partly as a result, annual global extraction of materials is growing²⁶, posing a major environmental risk at global level. Natural resource extraction and processing generate about half of the total greenhouse gas (GHG) emissions and more than 90% of water stress and biodiversity loss²⁷. European consumption trends in this respect are a cause for concern: if they persist, the European Green Deal goals of reaching zero net emissions of greenhouse gases by 2050 will be more difficult to meet. Europe is also relatively dependent on external sources of natural resources and energy, leading the Commission to develop policies to enhance “open strategic autonomy” when vulnerabilities were highlighted during the Covid pandemic.

One way to help tackle the above is to decouple economic growth from resource use. This occurs when resource use or pressures on the environment grow at a slower rate than the activity causing it (*relative* decoupling), or decline while the economic activity continues to grow (*absolute* decoupling). **The EU’s progress in this respect in recent years is mixed:** despite some periods of absolute decoupling since 2000, starting from 2013 the use of material resources in the EU has been increasing again (e.g. 4 % in 2013-2017). As a result, we have moved from absolute decoupling to re-enter a phase of relative decoupling²⁸. In addition Consumption Footprint²⁹ analysis shows that certain impact categories are showing a relevant impact *increase* (e.g. ozone depletion, mainly due to international cold chains transport; land use, due to increase of bio-based materials as input to different sectors, including textile, furniture etc.).

2) Planetary boundaries: The planetary boundaries (PBs) is a concept addressing Earth system processes which are affected by environmental boundaries in order to define a "safe operating space for humanity", as a precondition to achieve sustainable development. A recent JRC study³⁰ assessed the impacts of production and consumption in the EU and compared them with the PBs, finding that the impacts related to climate change³¹, particulate matter³², and fossil and mineral resources³³ were

²³ https://circulareconomy.europa.eu/platform/sites/default/files/circular_by_design_-_products_in_the_circular_economy.pdf

²⁴ In violation of Fundamental Conventions of the International Labour Organisation (ILO). The 8 Fundamental Conventions of the ILO are: Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87).

Right to Organise and Collective Bargaining Convention, 1949 (No. 98)

Forced Labour Convention, 1930 (No. 29) (and its 2014 Protocol)

Abolition of Forced Labour Convention, 1957 (No. 105)

Minimum Age Convention, 1973 (No. 138)

Worst Forms of Child Labour Convention, 1999 (No. 182)

Equal Remuneration Convention, 1951 (No. 100)

Discrimination (Employment and Occupation) Convention, 1958 (No. 111)

²⁵ <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/>

²⁶ OECD projects that global materials use will be more than double from 79 Gt in 2011 to 167 Gt in 2060. See <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf>

²⁷ Global Resources Outlook 2019: Natural Resources for the Future We Want: The International Resource Panel.

²⁸ EEA, Resource efficiency and the circular economy in Europe 2019 — even more from less.

²⁹ A life cycle assessment-based indicator that evaluates the environmental impacts of EU consumption by assessing five areas of consumption, namely food, mobility, housing, household goods and appliances

³⁰ Sala, S. and Sanye Mengual, E., Consumption Footprint: assessing the environmental impacts of EU consumption, European Commission, 2022, JRC126257, <https://publications.jrc.ec.europa.eu/repository/handle/JRC126257>.

³¹ Staying within a climate change planetary boundary (such as the Paris Agreement goal of limiting global warming to well below 2°C and pursuing efforts to limit the increase to 1.5°C) requires reducing CO2 emissions to net zero globally, and achieving declining net non-CO2 radiative forcing. In pursuit of this, the European Climate Law has set the objective of balancing greenhouse gas emissions and removals in the EU regulated in Union law at the latest by 2050.

close to or had already transgressed global boundaries, and that in all other impact categories a **negative environmental impact** was occurring. This means that, with less than 10% of the world's population, the EU was close to transgressing the global ecological limits for the impacts measures.

3) The EU's linear economy: While the shift toward the green transition has started, **the EU economy is still far from being circular and progress remains slow.** Linear systems involve a fast throughput of resources in the economy, with the value of those resources (in the form of products and assets) being lost rapidly. Resources exit the economy in the form of waste, pollution and emissions. The costs of dealing with waste, pollution and emissions do not fall on those putting products on the market. EU industry still accounts for 20% of the EU's greenhouse gas emissions³⁴. It also remains too dependent on a throughput of primary materials: though the circular material use rate³⁵ has been growing, progress remains very slow (8.2 in 2004 to 11.8 in 2019³⁶). Demand for recycled materials also remains low: only 9.5% (0.7 billion tonnes) of materials processed from 2010-2018 were from recycled materials³⁷. The share of market demand met by secondary materials also differs starkly: 50% or over for lead and copper³⁸, while for plastics it is only 6%³⁹ (of which only 2% is represented by single-use plastics⁴⁰), and for materials such as indium⁴¹, used in the touchscreens of smartphones, it is well under 10%.

4) Social conditions of production of products placed on EU market: Products, including those consumed in the European Union, can be produced under conditions that violate fundamental human rights⁴². These violations can take place within the EU or along the global chains supplying the products placed on its market. A 2021 report⁴³ of the ILO and Unicef warns that the number of children in child labour continues to rise. Some cases have been identified in sectors directly or indirectly linked to the products likely to fall within the scope of SPI, such as agriculture (i.e. farming of raw materials such cotton), mining and quarrying, and garments and textiles⁴⁴, while tens of thousands of children are reported to work in African open-pit mines, which supply niobium and tantalum to the global electronics industry⁴⁵. Contemporary forms of slavery have also been cited as occurring in global supply chains of international brands in the garment and footwear sector,⁴⁶ and forced labour in the manufacturing of electronic goods has been the subject of recent research.⁴⁷

³² This refers to adverse impacts on human health caused by emissions of Particulate Matter (PM) and its precursors (e.g. NO_x, SO₂). Usually, the smaller the particles, the more dangerous they are, as they can go deeper into the lungs. The potential impact of is measured as the change in mortality due to PM emissions, expressed as disease incidence per kg of PM_{2.5} emitted.

³³ The amount of fossil resources or mineral (e.g. metals) use for the production and the consumption of goods

³⁴ COM (2019), 640 final, p. 7.

³⁵ This measures the share of material recycled and fed back into the economy - thus saving extraction of primary raw materials - in overall material use. The circular material use rate, also known as circularity rate, is defined as the ratio of the circular use of materials to the overall material use.

³⁶ https://ec.europa.eu/eurostat/databrowser/view/cei_srm030/default/line?lang=en

³⁷ Eurostat Experimental Sankey Diagrams of material flows for the years 2010-2018; Eurostat (2018) Material Flow diagram for the EU-27 2018

³⁸ <https://copperalliance.eu/benefits-of-copper/recycling/>

³⁹ A European Strategy for Plastics in a Circular Economy, COM(2018) 28 final

⁴⁰ <https://www.minderoo.org/plastic-waste-makers-index/>

⁴¹ Foresight on Critical Raw Materials for European Industry, March 2020,

https://ec.europa.eu/info/sites/default/files/foresight_newsletters_collection_online_2020.pdf

⁴² In particular one or several of the 8 Fundamental Conventions of the International Labour Organisation (ILO). These are:

Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87); Right to Organise and Collective Bargaining: Convention, 1949 (No. 98); Forced Labour Convention, 1930 (No. 29) (and its 2014 Protocol); Abolition of Forced Labour: Convention, 1957 (No. 105); Minimum Age Convention, 1973 (No. 138); Worst Forms of Child Labour Convention, 1999 (No. 182); Equal Remuneration Convention, 1951 (No. 100); Discrimination (Employment and Occupation) Convention, 1958 (No. 111).

⁴³ International Labour Office and United Nations Children's Fund, Child Labour: Global estimates 2020, trends and the road forward, ILO and UNICEF, New York, 2021. <https://data.unicef.org/wp-content/uploads/2021/06/Child-Labour-Report.pdf>

⁴⁴ ILO, "Implementing the Roadmap for Achieving the Elimination of the Worst Forms of Child Labour by 2016: a training guide for policymakers" (2013), p. 9.

⁴⁵ B. Vivuya, Equal Times, 16 October 2020: "As incremental efforts to end child labour by 2025 persist, Congo's child miners – exhausted and exploited – ask the world to "pray for us"", available at: https://www.equaltimes.org/as-incremental-efforts-to-end#_YLTEOagzY2w

⁴⁶ See, for example, Centre for Research on Multinational Corporations and India Committee of the Netherlands, "Flawed Fabrics: the abuse of girls and women workers in the South Indian textile industry" (2014) (www.indianet.nl/FlawedFabrics.html); **Anti-Slavery International**, "Slavery on the high street: forced labour in the manufacture of garments for international brands" (2012) (www.antislavery.org/includes/documents/cm_docs/2012/s/1_slavery_on_the_high_street_june_2012_final.pdf).

⁴⁷ ILO referred to the response of a major United States electronics company to allegations of forced labour in factories in China in its publication *Combating Forced Labour: A Handbook for Employers & Business*, Good Practice Case Studies, Part 7 (2008), pp. 5–7. See

Within the EU itself, 610,000 are estimated to be victims of forced labour exploitation across a range of industries and economic sectors, including agriculture, manufacturing and construction (2012 figures⁴⁸), with migrant workers more likely to be found in such vulnerable situations⁴⁹.

5) Diverging national approaches: In the absence of overarching or harmonised rules at EU level, Member States (e.g. France, Germany, the Netherlands, and Finland) are pressing ahead with rules to foster the sustainability of the products placed on their markets and it is likely that the fragmentation of the internal market will continue to rise, as illustrated by the growing trend in the number of national environmental legislation entries that potentially have cross-border impact. Though Member State initiatives are a positive sign of their engagement with circular economy practices, they are leading to increasingly divergent national approaches, which is generating uncertainty for businesses. This in turn risks threatening their continued investment in innovation and sustainable product development (please see more information under sections on *Consequences* and *Drivers*, as well as in Annex 7).

Stakeholders agree to a large extent on topics closely related to the problem definition⁵⁰:

- *Most respondents to the Public Consultation agreed or strongly agreed that **products do not sufficiently cover the costs of the harm that their production and use cause to the environment**, particularly in the non-industry-related stakeholder categories⁵¹. While less industry representatives shared this view⁵², only a small minority of them disagreed or strongly disagreed⁵³.*
- *A clear majority of respondents to the Public Consultation, including SMEs⁵⁴, agreed or strongly agreed that there are **no harmonized requirements to foster the sustainable design of products**⁵⁵ and that **diverging national rules and lack of a harmonized set of EU rules discourage large businesses, which operate across various EU Member States, from offering more sustainable products**, compared to much lower numbers that disagree or strongly disagree⁵⁶.*

Three principle sub-problems can be identified as contributing to the main problem:

Sub-problem 1: Product design does not sufficiently take into account environmental impacts over the life cycle, including circularity aspects

Around 80% of a product's environmental impacts is determined at the design phase⁵⁷. Designing products in a more circular way⁵⁸ can offset the negative environmental impacts of products and

also China Labor Watch, "Is Samsung Infringing Upon Apple's Patent to Bully Workers?" (2012) (www.chinalaborwatch.org/upfile/2012_9_4/Samsung%20Report%200904-v3.pdf) and "Beyond Foxconn: Deplorable Working Conditions Characterize Apple's Entire Supply Chain" (2012) (www.chinalaborwatch.org/upfile/2012_8_13/2012627-5.pdf); and Verité, "Forced Labor in the Production of Electronic Goods in Malaysia: A Comprehensive Study of Scope and Characteristics" (2014) (www.verite.org/sites/default/files/images/VeriteForcedLaborMalaysianElectronics2014.pdf).

⁴⁸ ILO 2012 Global Estimate of Forced Labour – Regional Factsheet European Union. https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-brussels/documents/genericdocument/wcms_184975.pdf

⁴⁹ European Union Agency for Fundamental Rights, Protecting migrant workers from exploitation in the EU: workers' perspectives, 2019. https://fra.europa.eu/sites/default/files/fra_uploads/fra-2019-severe-labour-exploitation-workers-perspectives_en.pdf

⁵⁰ For more information, please see Annex 2

⁵¹ For example, 91% of EU citizens and consumer organisations (combined); 95% of environmental organisations and NGOs (combined); and 90% of EU public authorities.

⁵² Overall, 40% of business associations and companies (combined) agreed or strongly agreed; isolating SMEs as a category, 58% agreed or strongly agreed

⁵³ 20% of business associations and companies (combined) disagreed or strongly disagreed

⁵⁴ Companies/business organisations with less than 250 employees were considered as SMEs in the context of the OPC

⁵⁵ 65% of business associations and companies (combined) agree or strongly agree (while only 18% of them disagree or strongly disagree); 66% of SMEs agree or strongly agree; 92% of environmental organisation & NGOs (combined) agree or strongly agree; and over 95% of EU public authorities agree or strongly agree.

⁵⁶ Over 65% or over of all of the following categories agreed or strongly agreed: business associations and companies (combined); environmental organisation & NGOs (combined); EU public authorities. 53% SMEs agreed or strongly agreed. Figures disagreeing or strongly disagreeing were far lower, e.g. 17% of business associations and companies (combined).

⁵⁷ "How to do EcoDesign?", a guide for environmentally and economically sound design edited by the German federal Environmental Agency, Verlag form, 2000

‘close the loop’ for different materials and products. **We are not yet there, however:** the 2020 Circularity Gap report identified poor design of products as one of the chief contributory factors to continued linearity and reliance on virgin materials⁵⁹. In the EU, data on design-related dimensions such as *durability and reparability*, as well as *recyclability, reusability and re-manufacturability* appear to confirm this (please see Annex 7 for further details):

- *Durability and reparability*: reductions in the lifespan of some consumer products have been identified over recent years⁶⁰, in part due to the fact that design does not always take into account the need for products to be easily repaired. Aside from any reputational damage to the brand, the producer normally bears no costs or consequences for the post-sale performance, repair and end-of-life costs of its products. For example, the growing tendency to produce more integrated products has made disassembly of parts, and therefore repair, more difficult: batteries in the best-selling smart-phones of 2019 (48% of the European market) were all found to be fastened with adhesives (e.g. instead of joining mechanisms), meaning that removal is not possible without the intervention of experienced repairers⁶¹.
- *Recyclability, reusability and re-manufacturability*: increasingly complex product designs (including substances of concern and compound substances) are creating barriers to recycling. In the case of plastics in products for example, mixtures of different polymers and additives or differing materials mean that recyclers are increasingly unable to separate components effectively, and the production of high quality secondary materials is being hampered⁶². For textiles, chemicals chosen during production sometimes remain in the products throughout the use phase, with implications for recovery potential⁶³. In a market study⁶⁴ under the Horizon 2020 programme, one of the main barriers to wider roll-out of remanufacturing activities identified by the European Remanufacturing Network was “*poor design for remanufacturing: Particularly where remanufacturing is not embedded within the OEM culture, remanufacturing can sometimes be inhibited by poor design*”.

The net result is that products are being replaced more frequently than before, involving **significant energy and resource use** in order to produce and distribute new products and dispose of old ones⁶⁵. Significant jobs potential is also being lost in the repair, recycling, re-use and remanufacturing sectors⁶⁶. Evidence suggests that the environmental impacts from life cycle stages other than use are significant for many sectors⁶⁷.

⁵⁸ This would mean designing products in a way that facilitates the circular use of their materials (such as by ensuring recycling, reuse, refurbishment or remanufacturing can take place) and in a way that aims to reduce the generation of waste as well as our economy's dependence on extraction and imports of raw materials. See EEA, 2017, [Circular by design: Products in the circular economy](#)

⁵⁹ Circularity Gap Report 2020, p. 15, https://assets.website-files.com/5e185aa4d27bcf348400ed82/5e26ead616b6d1d157ff4293_20200120%20-%20CGR%20Global%20-%20Report%20web%20single%20page%20-%2020210x297mm%20-%20compressed.pdf

⁶⁰ See:

- Öko-Institut in Germany, Prakash S. e.a., 2016.

- EEB (2019) Coolproducts don't cost the earth -full report. www.eeb.org/coolproducts-report;

- Report by the NGO “*Halte à l'obsolescence programmée – HOP*”, “Lave-linge : une durabilité qui prend l'eau ?” (2019), <https://www.halteobsolescence.org/wp-content/uploads/2019/09/Rapport-lave-linge.pdf>

- Report for the Greens group in the German *Bundestag*, Geplante Obsoleszenz: Entstehungsursachen, Konkrete Beispiele, Schadensfolgen, Handlungsprogramm - Gutachten im Auftrag der Bundestagsfraktion Bündnis 90 / Die Grünen (2013), <https://www.schridde.org/download/Studie-Obsoleszenz-aktualisiert.pdf>

⁶¹ Cordella, M.; Alfieri, F.; Clemm, C.; Berwald, A.; 2020, Durability of smartphones: A technical analysis of reliability and reparability aspects, p.7.

⁶² Plastics Recyclers Europe, <https://www.plasticsrecyclers.eu/challenges-and-opportunities>

⁶³ Schmidt, A., Watson, D., Roos, S., Askham, C., Gaining benefits from discarded textiles: LCA of different treatment pathways, 2016

⁶⁴ Remanufacturing Market Study (Horizon 2020) European Remanufacturing Network et al (2015), <https://www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf>

⁶⁵ EEB, 2019, Cool Products Don't Cost The Earth, <https://mk0eeborgicuytuf7e.kinstacdn.com/wp-content/uploads/2019/09/Coolproducts-report.pdf>

⁶⁶ “How does the circular economy change jobs in Europe? Upskilling and reskilling for a just transition” SITRA, <https://www.sitra.fi/en/publications/how-does-the-circular-economy-change-jobs-in-europe/>

⁶⁷ E. Hertwich, and R. Wood, “The growing importance of scope 3 greenhouse gas emissions from Industry”, *Environ. Res. Lett.* 13 (2018) 104013

Stakeholders consulted in the context of this impact assessment agree to a large extent that the way products are currently designed can act as a barrier to increased sustainability⁶⁸:

- *Most respondents to the Public Consultation agreed or strongly agreed that **many products are not designed to be easily repaired or upgraded**⁶⁹. While **EU citizens & consumer organisations** showed overwhelming support for this view⁷⁰, it was shared somewhat less strongly by representatives of **industry**⁷¹.*
- *Most respondents also agreed or strongly agreed that **materials used in products are more and more complex and difficult to recycle**⁷². **EU citizens & consumers** showed strong support for this view⁷³, while representatives of **industry** did so to a lesser extent⁷⁴.*

Sub-problem 2: Too difficult for economic operators and citizens to make sustainable choices in relation to products

It is still too difficult for economic operators and citizens to make sustainable choices in relation to products given that relevant **information and affordable options** to do so are lacking. Information on product environmental characteristics is poor: 85% of people⁷⁵ are unsatisfied with the information available to them, yet most consumers want it so they can shift to buying more environmentally friendly products^{76,77}. In a **business-to-business** context, economic actors along the supply chain report considerable problems related to product design, and information gaps, such as between suppliers, producers, and waste recovery managers on composition, recyclability and toxicological characteristics of product materials^{78,79}. The magnitude of the problem is such that European industrial representatives have cited lack of available data as the main non-cost obstacle to higher demand and market competition for climate neutral basic materials and products⁸⁰. This lack of information leads to missed opportunities for sustainability and for value-retaining operations, and negatively affects the quality of and demand for secondary materials⁸¹, including inhibiting the adoption of Circular Business Models^{82,83} (CBM). The European Remanufacturing Network has identified “*lack of*

⁶⁸ For more information, please see Annex 2

⁶⁹ Overall, approximately 66% agreed or strongly agreed with this statement, while 8% disagreed or strongly disagreed.

⁷⁰ Approximately 92% of EU citizens & consumer organisations (combined) agreed or strongly agreed, while only 4% disagreed or strongly disagreed.

⁷¹ Approximately 47% of business associations and companies (combined) agreed or strongly agreed, while 12,5% disagreed or strongly disagreed.

⁷² Overall, approximately 60% agreed or strongly agreed with this statement, while 14% disagreed or strongly disagreed.

⁷³ Approximately 77% of EU citizens & consumer organisations (combined) agreed or strongly agreed, while only 6% disagreed or strongly disagreed.

⁷⁴ Approximately 46% of business associations and companies (combined) agreed or strongly agreed, while 18% disagreed or strongly disagreed.

⁷⁵ See SWD(2019) 92 final, p. 66

⁷⁶ This is in line with the findings from the consumer survey conducted in preparation of the Empowering the consumers for the Green Transition, with between 42% and 60% of respondents (depending on the products category) reporting that they would be willing to pay about 5% of the price of a product to receive information on the environmental characteristics of the product. European Commission, *IA supporting study*, forthcoming. Binninger, A.S., Robert, I., Ourahmoune, N., *Etiquettes environnementales et consommation durable: des relations ambiguës en construction*. Revue de l'organisation responsable 9, 2014, p. 5-24.

⁷⁷ Nicolli F, Johnstone N, So'nderholm P (2012) Resolving failures in recycling markets: the role of technological innovation. *Environ Econ Policy Stud* 14:261–288

⁷⁸ Circular Business Models: Overcoming Barriers, Unleashing Potentials (squarespace.com); [Circular Business Models: Overcoming Barriers, Unleashing Potentials \(squarespace.com\)](#)

⁷⁹ Nicolli F, Johnstone N, So'nderholm P (2012) Resolving failures in recycling markets: the role of technological innovation. *Environ Econ Policy Stud* 14:261–288

⁸⁰ Sartor, O. (Agora Energiewende), Whittington, E., Markkanen, S. (University of Cambridge Institute for Sustainability Leadership (CISL)): Tomorrow's market today: Scaling up demand for climate neutral basic materials and products, 2021, https://www.corporateleadersgroup.com/files/cisl-clg-agora_tomorrows_markets_today_report.pdf

⁸¹ Circular Business Models: Overcoming Barriers, Unleashing Potentials (squarespace.com); [Circular Business Models: Overcoming Barriers, Unleashing Potentials \(squarespace.com\)](#)

⁸² Adisorn, T.; Tholen, L.; Götz, T. Towards a Digital Product Passport Fit for Contributing to a Circular Economy. *Energies* 2021, 14, 2289. <https://www.mdpi.com/1996-1073/14/8/2289>

⁸³ Some companies have used data from product life cycle assessment to identify environmental focal areas or improve circularity along the supply chain (See [Philips](#) or [Levi Strauss](#)) while others report significant cost avoidance secured through comparative life cycle assessment (see [Unilever](#) reports over €700m of cumulative cost avoidance since 2008 through measures focussing on water, energy,

technical information on third party products...[where] the knowledge necessary to remanufacture products effectively is not readily available to non-OEMs” as one of the main barriers to wider roll-out of remanufacturing business models⁸⁴.

Stakeholders consulted in the context of this impact assessment agree to a large extent that lack of information is a barrier to more sustainable products and product choices in the EU⁸⁵:

- *Most respondents to the Public Consultation agreed or strongly agreed that products sold in the EU are less sustainable because **economic actors do not have adequate and reliable information on their sustainability**⁸⁶. This view was broadly shared amongst most **industry representatives**⁸⁷ as well as by **EU citizens & consumer organisations**⁸⁸.*
- *Most respondents agreed or strongly agreed that **requiring producers/importers to ensure information on reparability is provided on or with a product** would foster the overall sustainability of products⁸⁹. While **EU citizens & consumer organisations** showed strong support for this view⁹⁰, it was shared to a lesser extent by representatives of **industry**⁹¹.*

Another issue is the price gap vis-à-vis conventional, less sustainable products. Sustainable products are in some cases intrinsically more costly to purchase (in part because of market failures): whilst some consumers are willing to pay more for environmentally-friendly products and higher upfront costs can often be offset by extended product lifetime and/or lower usage costs, they need to be confident about the product’s credentials.

Consumers make choices about whether or not to purchase a product. If it is a replacement this is associated with decisions about not repairing or choosing to discard an existing product, unless it is not possible to effectively choose repair. Evidence shows that a significant proportion of appliances are replaced when there is no functional reason to do so⁹², for various reasons⁹³. A lack of information on e.g. product reparability or durability can be a factor in deciding whether to replace a product. Similarly, whether or not consumers can effectively repair a product and the rights they might have in this regard, can play an important role.⁹⁴ Many products are purchased by consumers, but used only intermittently. In such cases access to product as-a-service would be a less costly option, as well as being more optimal in resource-use. The provision of such servitised or sharing models is growing, but hindered through poor product design (intensive use leading to more frequent need for maintenance and repair) and poor information.

In addition, when choosing between products the consumer will make a decision based on multiple factors that are likely to include the functionality of a product and its price. An illustration of possible

waste and materials, and a media company reached over €30m cost avoidance through a comparative life cycle assessment of packaging focussing on greenhouse gas emissions only)

⁸⁴ Remanufacturing Market Study (Horizon 2020) European Remanufacturing Network et al (2015), <https://www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf>

⁸⁵ For more information, please see Annex 2

⁸⁶ Overall, approximately 58% agreed or strongly agreed with this statement, while 19% disagreed or strongly disagreed.

⁸⁷ 54% of business associations and companies (combined) agreed or strongly agreed; 22% disagreed or strongly disagreed. For SMEs, approximately 64% agreed or strongly agreed; 12.5% disagreed or strongly disagreed.

⁸⁸ 57% of EU citizens & consumer organisations (combined) agreed or strongly agreed, compared with 26% who disagreed or strongly disagreed.

⁸⁹ Overall, approximately 53% agreed or strongly agreed with this statement, while 12% disagreed or strongly disagreed.

⁹⁰ Approximately 74% of EU citizens & consumer organisations (combined) agreed or strongly agreed, while 11% disagreed or strongly disagreed.

⁹¹ Approximately 40% of business associations and companies (combined) agreed or strongly agreed, while 13% disagreed or strongly disagreed.

⁹² Premature Obsolescence Multi-Stakeholder Product Testing Programme: Product Lifecycle & Product Replacement reasons: replacement unrelated to reliability - 25% washing machines, 63% smartphones ; 63% TVs; 36% vacuum cleaners.

⁹³ <https://www.becomingminimalist.com/fooled/>

⁹⁴ The Commission is planning in 2022 an initiative to address consumers rights that promote a more sustainable use of products (‘right to repair’).

factors for the purchase of a washing machine are shown below⁹⁵. Energy use and other environmental factors may be important considerations, although this research shows that they were not the most important ones. It also must be noted that the importance of different characteristics changes with the product under consideration. Nevertheless since it is clear that these characteristics are taken into consideration by consumers, reliable and accessible information is needed to have efficient consumer purchase behaviour.

| Criteria | 1. Priority | 2. Priority | 3. Priority |
|--------------------|--------------|--------------|--------------|
| Price | 31.8% | 21.2% | 15.9% |
| Equipment | 19.2% | 7.3% | 8.6% |
| Energy Consumption | 11.9% | 25.2% | 17.2% |
| Brand | 9.3% | 8.6% | 8.6% |
| Water Consumption | 7.9% | 11.9% | 13.9% |
| Wash Load Capacity | 5.3% | 10.6% | 6.0% |
| Dimensions | 4.6% | 6.0% | 4.0% |
| Design | 1.3% | 1.3% | 3.3% |
| Short Wash Time | 0.7% | 3.3% | 9.3% |
| Low Noise | 0.7% | 2.0% | 7.3% |
| Dryer integrated | 0.0% | 0.7% | 0.7% |
| Other | 7.3% | 1.3% | 4.0% |
| Total | 100.0 | 99.3% | 98.7% |
| N | 151 | 150 | 149 |

Sub-problem 3: Sub-optimal application of the current Ecodesign legislation

Although the Ecodesign Directive is generally considered successful⁹⁶, its full potential is not systematically realised. This has been for instance recognised by the European Court of Auditors, which concluded that EU actions contributed effectively to reaching the objectives of the Ecodesign and Energy Labelling policy, but that effectiveness was reduced by significant delays in the regulatory process and non-compliance by manufacturers and retailers⁹⁷. Stakeholders have also raised concerns about the slow progress in reviewing Ecodesign product measures or addressing new products. A recent report⁹⁸ estimates the substantial potential benefits were product reviews not to have been delayed.

One of the reasons for this reduced effectiveness is the insufficient resources allocated within the Commission to manage the 29 product groups currently regulated. In addition, despite being identified as promising candidates, a number of energy related products are not yet regulated, largely because they have not yet been included in the Working Plan due to insufficient resources. For those regulated, a 2012 evaluation concluded that there may be additional “non-energy improvements” that have not been fully addressed as a result of the product scope, policy choices or the underlying technical analysis. These will not be addressed until the reviews can be carried out. There have also been significant delays in the adoption of new product regulations, leading to delays in achieving the increased energy savings and lower environmental impacts, in part due to the number and complexity of products that European Commission staff working on Ecodesign need to cover. Finally, lack of compliance is an issue, with some 10 to 25% of products estimated to be non-compliant, with around 10% of envisaged energy savings lost as a result⁹⁹.

⁹⁵https://www.alexandria.unisg.ch/4941/1/A07_Sammer_Wuestenhagen_BSE_2006.pdf#:~:text=H1%3A%20The%20energy%20label%20positively%20influences%20consumers%E2%80%99%20buying,products%20that%20are%20characterized%20by%20low-involvement%20buying%20decisions.

⁹⁶ See, e.g. ECOS “Ecodesign is one of the greatest success stories of the EU climate policies in the last decades” (https://ecostandard.org/news_events/2021-resolution-the-cu-must-advance-ecodesign-upgrades-to-reach-its-climate-objectives/) and Energy Efficiency Policies around the World: Review and Evaluation, p. 48, World Energy Council 2008. ECOS calls. More elements in Annex 6.

⁹⁷ ECA Special Report on EU action on Ecodesign and Energy Labelling (2020).

⁹⁸ Delays in eco-design implementation threaten 55% climate target and cost citizens billions; EEB & ECOS; September 2021

⁹⁹ Ecofys, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive: Background report I: Literature review, December 2013, p.9.

2.1. WHAT ARE THE CONSEQUENCES?

The problems identified give rise to inevitable negative consequences, for the **planet**, for **citizens** and for **markets**.

For the **planet**, this results in inefficient use of resources as levels of high quality recycling and uptake of secondary materials remain low. The per capita consumption footprint of products consumed in the EU internal market is outside the safe operating space for humanity for several categories of impacts, including climate change, pollution (e.g. particulate matter) and resource use (i.e. fossil fuels, minerals and metals)¹⁰⁰ and rose by 4% on average between 2010 and 2018¹⁰¹. These environmental impacts are also contributing significantly to biodiversity loss and impacting health. Waste levels generated in Europe have also been growing, and rose from 2.2 to 2.3 billion tons from 2010 to 2018¹⁰². Union-wide net greenhouse gas emissions, although 25% below their 1990 level¹⁰³, need to fall to zero by 2050 in order to meet the climate neutrality objective of the European Climate Law and contribute to halting global warming. Finally, significant pollution is being generated – in particular at the production stage of products and along the product supply chain¹⁰⁴ - with short product life leading to high replacement rates and therefore further pollution. The most polluting production processes are regulated by the Industrial Emissions Directive, but this concerns only the production processes located in the EU, not in third countries.

For **citizens**, there are costs from reduced lifespan of their products and the difficulty to choose products tailored to their needs, including over the use phase. Whilst not wishing to incur the costs of replacing a product with a new replacement, consumers face a lack of relevant information on how to repair a product, lack of availability of spare parts and high repair costs, which act as dissuasive barriers to product repair^{105,106}. On the whole, consumers are having to replace products sooner than expected, leading to indirect additional costs as well as to increased ‘hassle costs’¹⁰⁷. Resale value of used products is also reduced as poor residual values are reflected by markets. The difficulty to make informed choices (in particular due to lack of information on a product’s environmental characteristics¹⁰⁸) is also hindering them from fulfilling their growing levels of ‘green’ ambition^{109,110} - i.e. their willingness to engage in sustainable practices and product choices. The loss of value and functionality to individual consumers is collectively a loss of wellbeing for society.

Markets are resulting in a sub-optimal consumption of sustainable products (see also section 2.2 *What are the problem drivers?*): producers are not sufficiently taking into account environmental impacts, and it is difficult for economic operators and citizens to make sustainable choices. Taken together, this leads to a sub-optimal market result, which is inefficient. In part this stems from an under-internalisation of externalities at the product level. In addition, in the absence of overarching or harmonised rules at EU level, the Single Market is also being hindered by fragmentation, with a number of EU Member States already pressing ahead with rules to foster the sustainability of the products placed on their markets – something which is already a cause for concern for businesses operating in the EU (see *Table on responses from businesses/business associations* in *Consequences* section, Annex 7). If left unchecked, such diverging approaches are likely to create further difficulties

¹⁰⁰ Sala, Serenella, et al., Indicators and Assessment of the Environmental Impact of EU Consumption, Joint Research Center Science for Policy Report 2 (2019), figures 58 and 70b.

¹⁰¹ Sala, S. and Sanye Mengual, E., Consumption Footprint: assessing the environmental impacts of EU consumption, European Commission, 2022, JRC126257, <https://publications.jrc.ec.europa.eu/repository/handle/JRC126257>.

¹⁰² Eurostat. Generation of waste by waste category, hazardousness and NACE Rev. 2 activity [ENV_WASGEN]

¹⁰³ EU Climate Action Progress Report, November 2020 *Kick-starting the journey towards a climate-neutral Europe by 2050*.

¹⁰⁴ E.g. for electronic products, see

https://ec.europa.eu/environment/enveco/resource_efficiency/pdf/studies/issue_paper_digital_transformation_20191220_final.pdf

¹⁰⁵ European Commission, *Behavioural Study on Consumers’ engagement in the circular economy*, 2018, p. 86.

¹⁰⁶ LE Europe, VVA Europe, Ipsos, ConPolicy and Trinomics: “Behavioural Study on Consumers’ Engagement in the Circular Economy - Final Report” (2018), <https://op.europa.eu/en/publication-detail/-/publication/5de64de7-f9d3-11e8-a96d-01aa75ed71a1/language-en/format-PDF>.

¹⁰⁷ BEUC, 2015, Durable goods: More sustainable products, better consumer rights

¹⁰⁸ SWD(2019) 91 final, p. 66

¹⁰⁹ European Commission, *Behavioural Study on Consumers’ engagement in the circular economy*, 2018, p. 10.

¹¹⁰ <https://www.ingwb.com/media/3076131/ing-circular-economy-survey-2020-learning-from-consumers.pdf>

for businesses and hamper the level playing field. This is likely to increase the administrative burden for companies operating on the internal market, leading to sub-optimal outcomes in terms of innovation and sustainable production. Finally, significant valuable resources are being lost, given that the contribution of recycled materials to raw material inputs is low (e.g. for materials needed in renewable energy technologies or high-tech applications, secondary production makes only a marginal contribution to EU's consumption¹¹¹; for plastics it accounts only for 6%¹¹²); that many products are still being designed for single use¹¹³; that many products contain substances and compounds that are difficult to recycle and contaminate and hence lower the value of recyclates, and that in some cases consumer products that are not sold are being destroyed^{114,115}.

Low rates of recycling lead to many lost **job** opportunities in the waste management sector, but far more job potential is foregone through poor product design and information reducing the viability of value retention activities before the waste phase. A study of examples in 16 countries by Gaia¹¹⁶ revealed that the job intensity of re-use, repair and remanufacturing activities per 10,000 tonnes of waste is far higher than its disposal through landfill or incineration, with re-use generating more than 400 jobs, compared to 115 for recycling and 2 for incineration and landfill. A market study of remanufacturing in Europe estimated that in 9 sectors alone there is potential to generate between 450,000 and 600,000 jobs by 2030¹¹⁷. Looking at the production stage, a shift to higher resource efficiency implies a rebalancing of relative factor inputs, with more value being added to each unit of materials. This generally implies application of more labour input.

2.2. WHAT ARE THE PROBLEM DRIVERS?

Market failures

There is a **market distortion** in the shape of uncorrected externalities: environmental, health, social or other impacts generated by a product and not reflected in its price. This means that competitive market forces are not resulting in efficient prices, but instead are biased towards externality-generating products or activities. These externalities are only partially corrected through economic incentives, such as taxes, or fees, to "internalise" these products' externalities. For example, for air pollution, the degree of internalisation is estimated to be around 44% with unpriced externalities of around EUR 400 billion per annum¹¹⁸. The 'polluter pays' principle is not consistently applied across the EU, further aggravating the problem¹¹⁹.

Imperfect communication in the supply chain about a product's energy and environmental information leads to market failure in terms of purchasing decisions (see also section 2 *Sub-problem 2: Too difficult for economic operators and citizens to make sustainable choices in relation to products*). Although many consumers want to make more sustainable product choices, they often cannot do so. The market response to this issue has resulted in a proliferation of methods and initiatives and has boosted the number of environmental claims – in many cases based on different, inconsistent methods, with a varied level of reliability and coverage. This market failure has been identified in accompanying proposals on Empowering Consumers for the Green Transition and the Green Claims Initiative. The three initiatives complement each other to ensure that information on the

¹¹¹ Foresight on Critical Raw Materials for European Industry, March 2020, https://ec.europa.eu/info/sites/default/files/foresight_newsletters_collection_online_2020.pdf

¹¹² A European Strategy for Plastics in a Circular Economy, COM(2018) 28 final

¹¹³ Circle Economics, "Circularity Gap Report 2020", <https://www.circularity-gap.world/2020>

¹¹⁴ M6, "Capital" enquiry of January 2019 on Amazon: <https://www.rtl.fr/actu/debats-societe/video-capital-quand-les-salaries-d-amazon-detruisent-des-tonnes-d-invendus-7796192959>

¹¹⁵ ITV News Investigation "Amazon destroying millions of items of unsold stock in one of its UK warehouses every year", June 2021, <https://www.itv.com/news/2021-06-21/amazon-destroying-millions-of-items-of-unsold-stock-in-one-of-its-uk-warehouses-every-year-itv-news-investigation-finds>

¹¹⁶ Gaia "Zero Waste and Economic Recovery - The Job Creation Potential of Zero Waste Solutions" (2021)

¹¹⁷ European Remanufacturing Network (2015)

¹¹⁸ "Green Taxation and other economic instruments: Internalising environmental costs to make the polluter pay", IEEP et al, 2021 (forthcoming, will be published before the Summer)

¹¹⁹ ECA, Special report 12/2021: "The polluter pays principle: inconsistent application across EU environmental policies and actions".

sustainability performance of products is reliable, credible, and clear (see *Annex 14: Articulation with existing legislation and other initiatives* for more details).

Overall, given that the market appears not to properly reward sustainability, and there is no direct request to pay for pollution (see recent report of the European Court of Auditors¹²⁰), there is a **lack of incentive for producers to produce more sustainable products**.

As part of the latter two drivers, there is a **failure of markets and product design to properly enable the development of Circular Business Models (CBM)**. It is not easy acting as a circular business in linear markets, value chains, regulatory and financial frameworks. CBMs include notably product service systems (product-based services, use-oriented services and result-oriented services), value retention and product life-extension activities. These CBMs face significant barriers, the principle ones being, firstly, split incentives in value chains which mean that (for example) a producer has little or no interest in designing a product for future value retention (repair, servicing, component harvesting, remanufacturing, recycling) or for multiple users. Secondly, organisational challenges in the supply chain, in particular related to loss of upstream information, and loss of contact with stakeholders further down the value chain, is also hindering progress. Developing these activities therefore depends to a large extent on physical design attributes of products, and on access to relevant data. The result is that sectors such as furniture, high impact intermediary products (e.g. chemicals, steel) and electronics & ICT have particularly low CBM market penetration: 3%, 4% and 4% respectively¹²¹.

Regulatory and administrative failures

The EU regulatory framework for sustainable production and consumption is insufficiently developed. As outlined in previous section, there is currently no overarching, integrated EU policy instrument capable of covering the sustainable production and consumption of all products and/or the availability and reliability of sustainability information on these products. Rather, a ‘patchwork’ regulatory situation exists, which allows only certain aspects related to product sustainability and circularity to be addressed, and leaves certain highly relevant sectors (such as textiles and furniture) almost wholly unaddressed in this respect. This situation leaves room to national initiatives: as illustrated in Annex 7 (see in particular *Table on national level initiatives*), Member States have begun to press ahead with national-level rules to foster the sustainability of the products placed on their markets. While such initiatives are indicative of the growing momentum at national-level to engage with circular economy practices to foster sustainable products, they risk leading to growing uncertainty for businesses, increased administrative burden and potential barriers to the development of their economic activities (something businesses themselves have drawn attention to, see *Consequences*), thus exacerbating the main problem SPI intends to address.

Despite its successes, the Ecodesign regulatory framework could also benefit from a greater political focus and adjustments based on experience and evolutions of the wider legislative framework, from the Lisbon Treaty to reviewed Market Surveillance rules. Evaluations and stakeholders point to some **shortcomings of implementation and enforcement that lead to a sub-optimal application of the Ecodesign Directive**. Upstream, significant delays in the regulatory process, linked partly to its complexity and primarily due to the limited available staff resources, reduce the effectiveness of the policy, leading to delayed or missed opportunities as requirements become outdated or are applied too late. Downstream, there is a general agreement that the level of market surveillance and customs enforcement is too low and should be increased as it is economically beneficial for society (current investments in enforcement are estimated to be 0.05% of the value of lost energy savings¹²²). Apart from the level of resources allocated to market surveillance and customs authorities, timely access to

¹²⁰ ECA, Special report 12/2021: “The polluter pays principle: inconsistent application across EU environmental policies and actions”

¹²¹ Analysis of sectoral distribution of 2380 European companies with CBMs carried out in the context of the study to support this initiative.

¹²² Ecofys final technical report p.159 referring to P. Waide et al., Enforcement of energy efficiency regulations for energy consuming equipment: findings from a new European study, Proceedings of the 6th International Conference EEDAL'11 Energy Efficiency in Domestic Appliances and Lighting

product documentation and EU Market Surveillance Authorities (MSA) cooperation could be improved.

Behavioural biases

Behavioural biases – including cognitive biases – are also relevant for better understanding the main problem and need to be taken into account in possible solutions. Such biases include the fact that some consumers take consumption decisions based on short-term costs and disregard the long-term costs of their choices (myopic behaviour). In addition, for consumers, a transition to more environmentally sustainable choices often requires a behaviour change, which is difficult because of resistance to change and the status quo bias. The result can sometimes be consumer choices that appear irrational, both at the individual level and in consumer trends, due for instance to perceived obsolescence, where despite being functional, a product is no longer perceived to be stylish or appropriate, so it is rendered obsolete by perception, rather than by function. In Annex 7: Problem Definition, four types of behavioural biases have been identified as important drivers for the problems analysed above: social norms, bounded rationality, myopic behaviours, and linear production and consumption patterns as the default options. While increased availability of information on the sustainability characteristics of products cannot be expected to remedy such behavioural biases in full, it is expected to play a role in increasing awareness and nudging consumers towards more sustainable choices over time. This may be of relevance in particular for undecided consumers (i.e. those who do not usually buy environmentally-friendly products but intend to/are considering doing so), given that the ease with which a sustainable product can be differentiated from other products appears to play a role in encouraging sustainable product choice¹²³.

2.3. HOW WILL THE PROBLEM EVOLVE?

The underlying drivers of the problem will continue, and show signs of strengthening rather than abating. As a result, the problems would also worsen over time in the absence of new policies. There is however an ongoing evolution of the EU policy landscape with a number of product related regulatory instruments (beyond the Ecodesign Directive) expecting revisions by 2022 (e.g. construction products, packaging and packaging waste, vehicles, chemicals in electric and electronic products, batteries and industrial emissions). In addition, new EU initiatives e.g. on Empowering Consumers for the Green Transition, the Green Claims Initiative, the Circular Electronic Initiative, and the Strategy for Sustainable Textiles will promote a clean and circular economy approach for selected products and increase transparency around sustainability of various products. The development of taxonomy screening criteria relating to circularity and other sustainability objectives will also incentivise access to finance for more sustainable production and products. Furthermore, a set of EU voluntary instruments (e.g. EU Ecolabel, Green Public Procurement (GPP), Environmental Technology Verification (ETV)¹²⁴) and funding programmes for innovation, research, development and market uptake will continue to promote innovative products, solutions, and business models. The recently adopted Zero Pollution Action Plan¹²⁵ as well as the Chemicals Strategy for Sustainability¹²⁶ will also drive the development of cleaner, less polluting products or alternative services (e.g. through the ‘safe and sustainable by design’ approach).

Nevertheless, whilst these will all contribute positively to addressing the problem, and can be justified individually, they will not resolve the problem or its underlying drivers in full – actually the effectiveness of some of the above-mentioned initiatives (such as the initiative on Empowering Consumers for the Green Transition, the textiles strategy and the Right to Repair) will be enhanced

¹²³ *Flash Eurobarometer 367*, p. 6: “Respondents who do not buy environmentally-friendly products but intend to, are significantly less likely to believe that environmentally-friendly products are easily available compared with those who sometimes buy them (42% versus 54%). This suggests that environmentally friendly products should be more carefully presented so that they could be more easily differentiated from other products.”

¹²⁴ https://ec.europa.eu/environment/ecoap/etv_en

¹²⁵ COM(2021) 400 final

¹²⁶ COM(2021) 667

by the presence of a regulatory framework setting sustainability requirements on products or groups of products, including for non-energy related products.

Importantly, the absence of an overarching framework to ensure product sustainability in the EU will undoubtedly mean that fragmentation of the EU Internal Market gains further momentum, as individual Member States continue their attempts to tackle the problem at national level.

Sub-problem 3 on the sub-optimal application of the current Ecodesign Directive is also unlikely to evolve positively: with no increase in resources, its application will be mostly restricted to updating existing legislation, with limited opportunities to cover a significant number of new energy related products or increase delivery speed in Option 1 (the Business as Usual).

More elements and analysis are in Annex 7: Problem Definition.

3. WHY SHOULD THE EU ACT?

3.1. LEGAL BASIS

The legal basis is Article 114 of the Treaty on the Functioning of the European Union. On the basis of this provision, the Union can take action to ensure the functioning of the internal market.

Section 2 *Problem definition* of this impact assessment demonstrated that a number of problems hindering both the uptake of sustainable products and the functioning of the internal market currently exist. The absence of adequate and comprehensive internal market rules to regulate sustainable consumption and production, leaves room for solutions currently being developed by Member States or by industries and which contribute to the dysfunctionality of the internal market by generating potential barriers, fragmentation and incoherent approaches. Measures based on Article 114 TFEU aiming to build an internal market for sustainable products and ensuring that national initiatives do not hamper its functioning are therefore appropriate.

In addition to pursuing internal market objectives, the proposal will contribute to a high level of environmental protection (Article 3 TFEU), by unlocking opportunities for the circular and sustainable economy. However internal market objectives are predominant and environmental and social benefits are complementary.

Moving from the aims to the nature of the initiative, the main content of the future legal provisions is a mechanism for the setting of harmonised requirements for products to be placed on the internal market. The future legal instrument is therefore product-centred, built on a free movement clause and will contribute to the establishment and functioning of the internal market for sustainable products.¹²⁷

As a consequence, Article 114 is the appropriate and correct legal basis, even if other considerations (environmental and social) are decisive for the choices made within that measure.

3.2. SUBSIDIARITY: NECESSITY OF EU ACTION

The necessity test is the question of whether the objectives can be sufficiently achieved by action taken by Member States alone. In this case, they cannot. In order to ensure a level playing field for manufacturers, recyclers, importers and economic operators more broadly in terms of the requirements to be met when placing products on the EU market, it is essential to put in place a common set of rules, which include harmonised requirements to ensure product design sufficiently takes into account environmental impacts and the obligation to provide reliable information to end-users. For these reasons, EU-wide legislation is necessary. Without an EU-level initiative and its

¹²⁷ This is a continuation of the approach used by the current Ecodesign Directive 2009/125/EC (although wider in scope and richer in aspects addressed) which also has Article 114 as legal basis.

effective application, the problems assessed in this impact assessment could not be fully and consistently addressed across the EU. National initiatives, while bringing certain benefits at national level, would inevitably further fragment the internal market and render consumer choices more complicated. Member States have indeed already started to address the issue as shown *inter alia* by the steep increase of notifications for national products measures linked to environmental considerations, and by various already adopted national legislation setting product requirements.¹²⁸

This circumstance apart from substantiating the main condition, considered by the ECJ for the legitimate use of Article 114¹²⁹, justifies the necessity of the EU action: not only to prevent the likely emergence of such obstacles but also to address a fragmentation that is already visible and to eliminate the distortions of competition deriving from it.

3.3. SUBSIDIARITY: ADDED VALUE OF EU ACTION

There is clear added value in setting common requirements at EU level, as this will ensure a harmonised and well-functioning internal market across all Member States and, therefore, a level playing field for businesses. With harmonised minimum and information requirements set at EU level, sustainable products and circular practices and business models will be promoted in all Member States, creating a larger and more efficient market and hence greater incentives for the industry to develop them.

In addition, the internal market size provides a critical mass enabling the EU to promote product sustainability and to influence product design and value chain management worldwide. Supporting measures to actively promote the uptake of these standards globally should also be envisaged.

The proposed measures will not go beyond what is necessary to provide regulatory certainty while ensuring a high level of protection of health and of the environment. EU action is therefore justified and necessary.

4. OBJECTIVES: WHAT IS TO BE ACHIEVED?

The general objective is to **reduce the negative life-cycle environmental and social impacts of products and improve the functioning of the internal market.**

This general objective responds to the problems and their underlying drivers. In particular, it reflects the fact that the EU's internal market includes products that are associated with unnecessary environmental and social impacts. The general objective builds on experience gained under the current Ecodesign Directive, which has proven that product performance can be improved, whilst usually delivering overall benefits for citizens. SPI also addresses the objectives of industrial policy. The industry needs harmonised requirements applicable across the board and adequate enforcement and reinforced market surveillance and customs controls. SPI will enable the EU industry to deliver on sustainable production strengthening a level-playing field and the demand for sustainable goods.

Following from the general objective, **the specific objectives** are to:

- Improve products sustainability
- Better access to sustainability information along the supply chain
- Incentivise more sustainable products and business models to improve value retention
- Improve application of sustainable product legislative framework

¹²⁸ See Annex 7, under the problem drivers related to regulatory and administrative failures, the extracts from the TRIS Database and the Table on national level initiatives. See also the Table on excerpts from the business replies to the consultation on the Inception Impact Assessment that underline the relevance of the market fragmentation issue.

¹²⁹ The likely emergence of obstacles to trade, together with the need to eliminate the related distortions of competition (Case C-376/98 *Tobacco Advertising*, paras 84-88)

The specific objectives relate either to the problems directly or to their underlying drivers. For the behavioural drivers, it should be noted that these cannot be addressed directly but that their negative consequences can be tackled by the options (e.g. by restricting harmful choices). The progress to achieving the specific objectives can be measured through the monitoring indicators described in section 8 (and Annex 13). All specific objectives help to promote more sustainable consumption patterns in the EU. Operational objectives for specific product groups will be determined at a later stage and on the basis of impact assessments that accompany future SPI measures (see box 2 below).

4.1. THE INTERVENTION LOGIC

The intervention logic sets out the underlying reasoning of this Impact Assessment. The objectives are intended to channel the response to the problems within scope. Given the breadth of scope, problems and underlying drivers at hand, and their sometimes independent nature, **six options** for action (in addition to a 'Business As Usual' option) have been identified, with various sub-options considered under each. Based on an individual assessment of these sub-options, a preferred sub-option per main option is selected. The combination of the preferred sub-options for each of the main options forms the basis for the **overall preferred option**, which is then also assessed.

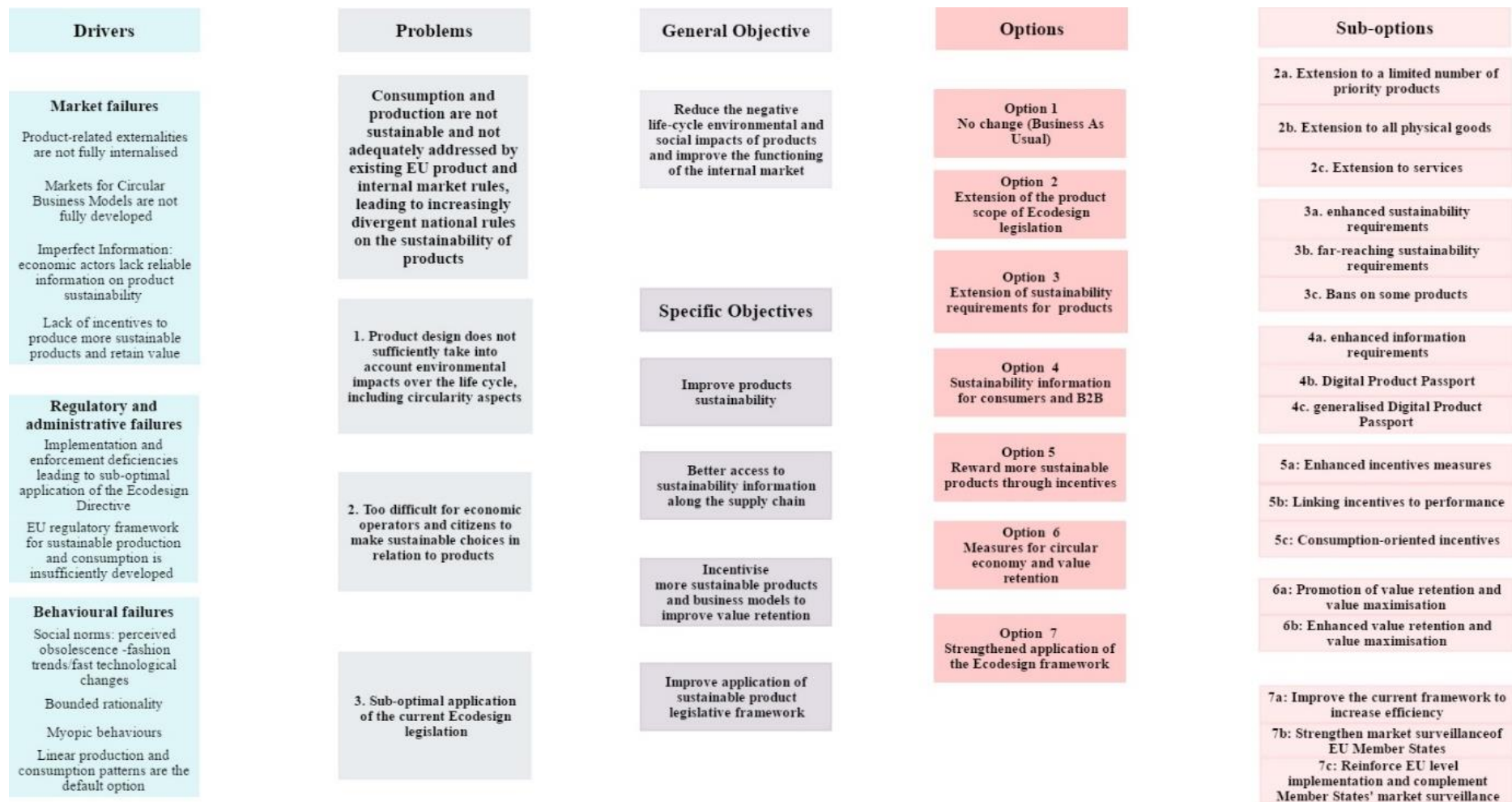


Figure 1 Intervention logic

The specific objectives aim either to address the identified problems directly or – where possible – to address the underlying problem drivers. As explained above for behavioural drivers, some of them can only be addressed indirectly. All retained options also aim to address the general objective.

5. WHAT ARE THE AVAILABLE POLICY OPTIONS?

Each option from Figure 1 (as further detailed in Table 1) responds to a Specific Objective, and through that to a problem or underlying driver. The options are not mutually exclusive but rather tackle separate issues. The content of each sub-option (i.e. the detailed measures that make them up) is the result of underlying analyses and/or stakeholder consultation. Sub-options group measures to keep the analysis manageable, but analysis of each individual measure is included in Annex 10. The groupings reflect step ups in ambition (i.e. effectiveness), and allow for coherent sets of measures.

Not considered explicitly as an option, but central to the delivery of the preferred option, is the question of the **administrative setup**. Essentially, ambitious choices can only be delivered if there are adequate resources in place to implement them (see section 7.10 and 7.11 below).

Box 2: Preamble to description of the policy options

Architecture of the future SPI instrument

Given the centrality of the extension of the Ecodesign Directive to this initiative, it is important to note that the design of the future SPI instrument is likely to closely resemble that of the existing Ecodesign Directive. In essence, this means that detailed product rules (*such as on the minimum durability of a washing machine; what fibres a T-shirt should be designed with to ensure it can undergo high-quality recycling; or what sustainability information should be made available when a product is placed on the market, etc.*) will not be set out in the main legal act, but rather laid down in a second stage, via **SPI measures** dedicated to a particular product or to groups of products.

This architecture is thus built on product-specific rules, which allows taking into account the specificities of a particular product or group of products with sufficient commonalities. A theoretical alternative would be to introduce general horizontal rules that would apply to all products. Yet, given the huge number of different types of products and the large variety of their characteristics (and possible trade-offs), a set of horizontal rules would create legal uncertainty regarding what this would mean in practice for a particular product and ultimately require guidance for each product or group. Moreover, the risk of market fragmentation would remain as general rules would likely be interpreted differently across Member States for particular products. In light of these considerations, general horizontal rules would be unlikely to solve the problems identified and are clearly inferior to product-specific rules, which can be tailored to the characteristics of the products and the sustainability issues pertaining to them.

The SPI measures will in all cases be preceded by a thorough preparatory process, including inclusive stakeholder consultation and impact assessment. This reflects how the current Ecodesign Directive operates today, and acknowledges that such steps are necessary before the adoption of effective, proportionate and product-appropriate rules can take place.

Taking this architecture into account, it should be pointed out that certain decisions regarding the parameters of the future SPI framework legal instrument (e.g. its future scope and the categories of sustainability and information requirements it will lay down; *see options 2, 3 and 4*) are not in themselves expected to have a direct impact on the product sectors concerned. Rather their effects will be felt following the adoption of the above-mentioned SPI measures, to be preceded by a thorough preparatory process as outlined above.

Table 1 Policy options, sub-options and related measures

| Sub-Problems | Specific Objectives | Option 1 - Business As Usual | | | |
|---|---|---|--|--|--|
| 1) Product design does not sufficiently take into account environmental impacts over the life cycle, including circularity aspects And | SO1: Improve products sustainability | Option 2: Extension of the product scope of Ecodesign legislation | 2a Extension to a limited number of priority products (not addressed through separate legislation). Energy Related products + Textiles, Furniture, High impact intermediary products, Chemicals | 2b Extension beyond sub-option 2a to all physical goods | 2c Extension beyond sub-option 2b to all services |
| | | Option 3: Extension of sustainability requirements for products | 3a Enhanced sustainability requirements (for specific products in SPI measures ¹³⁰): <ul style="list-style-type: none"> • minimum requirement on the durability or reliability of the product or its components • minimum requirements on reparability and upgradability • restricting the presence of substances hindering circularity • minimum requirements on recycled content on the product or its components • minimum requirements to reduce carbon and environmental footprints • Requirements enabling high-quality recycling | 3b Far-reaching sustainability requirements Sub-option 3a plus: <ul style="list-style-type: none"> • Adoption of SPI measures setting out requirements covering groups of products (e.g. reparability for electronics) • Minimum requirements on re-manufacturability • Requirements of due diligence on the supply chain of products | 3c Bans on some products Sub-option 3b plus: <ul style="list-style-type: none"> • Measures banning some products or some materials in specific products |
| 2) Too difficult for economic operators and consumers to make sustainable choices in relation to products | SO2: Better access to sustainability information along the supply chain | Option 4: Sustainability information for consumers and B2B | 4a Enhanced information requirements <ul style="list-style-type: none"> • information requirement on the durability or reliability of the product or its components • information requirements on reparability and upgradability, including a reparability scoring • informing on the presence of substances of concern and tracing them • information requirements on recycled content on the product or its components • Information requirements on the environmental impacts along the life-cycle of the product, for example in | 4b European Digital Product Passport Sub-option 4a plus: <ul style="list-style-type: none"> • Information requirements in the form of a European Digital Product Passport through SPI measures • Integrating the SCIP Database (implementing Article 9 (1) (i) of the Waste Framework Directive) with SPI information requirements | 4c Generalised European Digital Product Passport Sub-option 4b plus: <ul style="list-style-type: none"> • Direct implementation of “cross-sectoral” information requirements in a European Digital Product Passport applicable to all products in scope and based on horizontal requirements already included in the legislative act |

¹³⁰ Could be implementing or delegated acts. To be decided when finalising the legal proposal.

| | | | | | |
|---|---|---|--|--|--|
| | | | <p>the form of an Ecological profile</p> <ul style="list-style-type: none"> • Information requirements in the form of sustainability performance classes • Information requirements on a set of social indicators | | |
| | SO3: Incentivise more sustainable products and business models to improve value retention | Option 5: Reward more sustainable products through incentives | <p>Sub-option 5a: Enhanced incentive measures</p> <ul style="list-style-type: none"> • Member States encouraged to introduce reputational and economic incentives and supported by the provision of guidelines • Mandatory Green Public Procurement requirements in SPI product-specific rules | <p>Sub-option 5b: Linking incentives to performance</p> <p>Sub-option 5a plus:</p> <ul style="list-style-type: none"> • Member States obliged to use classes of performance to introduce reputational and economic incentives • Modulation of EPR fees to classes of performance | <p>Sub-option 5c: Consumption-oriented incentives</p> <p>Sub-option 5b plus:</p> <ul style="list-style-type: none"> • Bonus for EU citizen to reduce carbon footprint. • Introduction of an excise proportional to the life cycle environmental performance |
| | | Option 6: Measures for circular economy and value retention | <p>Sub-option 6a: Promotion of value retention and value maximization</p> <ul style="list-style-type: none"> • Provide guidelines on supporting circular business models • EU-wide hub supporting the uptake of circular business models | <p>Sub-option 6b: Enhanced value retention and value maximization</p> <p>Sub-option 6a plus:</p> <ul style="list-style-type: none"> • Introduce transparency obligation on the destruction of unsold consumer products, and a ban on destruction via SPI measures | |
| 3) Sub-optimal application of the current Ecodesign legislation | SO4: Improve application of sustainable product legislative framework | Option 7: Strengthened application of the Ecodesign framework | <p>Sub-option 7a: Improve the current framework to increase efficiency</p> <ul style="list-style-type: none"> • Streamline the procedures for the development and adoption of Ecodesign implementing regulations • Introduce possibility to collect data from manufacturers and retailers regarding regulated products sales and usage • Expand provisions related to third party conformity assessment | <p>Sub-option 7b: Strengthen market surveillance by EU Member States</p> <p>Sub-option 7a plus:</p> <ul style="list-style-type: none"> • Make product information digitally available to Market Surveillance Authorities (MSA) and to customs authorities • Structural technical support to improve cooperation between MSAs and ensure sufficient capacities • Organise common trainings for staff of notified bodies, notifying authorities and MSAs • Publish MSA penalties decisions • Benchmark and reporting obligation for MSs • Establish requirements for market surveillance checks | <p>Sub-option 7c: Reinforce EU level implementation and complement Member States' market surveillance</p> <p>Sub-option 7b plus :</p> <ul style="list-style-type: none"> • Complement national market surveillance where needed • Product monitoring and EU testing capacity • Assistance to implementation for suppliers and MSAs • Third party channel for market surveillance |

5.1. WHAT IS THE BASELINE FROM WHICH OPTIONS ARE ASSESSED?

Under the Business As Usual (Option 1), all relevant EU level and national policies and measures are envisaged to remain in force within the time horizon of 2030. The situation and problems would evolve as described in *Annex 9: Policy Options and Measures*, with a positive trend towards sustainable consumption recognisable, but progress remaining slow, as the rising trends of waste generation, consumption and environmental impacts detailed in Annex 7: Problem Definition indicate.

The Ecodesign Directive Work Plan for 2016-2019 added additional groups of energy related and ICT products¹³¹. However, because of the constraints explained in Sub-problem 3 (see section *Sub-problem 3: Sub-optimal application of the current Ecodesign legislation*), the number of new products that could effectively be regulated by 2030 will remain limited, with existing resources being rather focused on the necessary reviews of the most significant existing product regulations. It is likely that an increasing number of circularity and sustainability requirements will be covered for these product regulations.

Beyond that, the baseline also assumes that other EU and Member States' policies in preparation and relevant to sustainable products would be implemented. However, the impacts of those initiatives proposed in the context of the CEAP (in parallel to SPI) are described in a qualitative way only. Information on the baseline is provided in *Annex 9: Policy Options and Measures*, including further details each of the options.

5.2. WHAT ARE THE POLICY OPTIONS?

Option 1: Business As Usual (see section 5.1 above)

Option 2: Extension of the product scope of Ecodesign legislation

In order to achieve the objectives of this initiative, in particular specific objective 1 to 'Improve products sustainability', the first option relates to extending the product scope of the Ecodesign Directive beyond energy-related products, taking into account previous analysis indicating that significant sustainability benefits could be gained from such an approach, as well as general support from stakeholders¹³². The sub-options retained for analysis consider **2a**) an extension of the scope to a limited number of priority products; **2b**) a wide extension to all physical goods; and **2c**) an extension to all services.

Presented below are the three approaches to extending the scope of the Ecodesign Directive that have been retained for analysis. It should be noted from the outset that, given the architecture of the Ecodesign instrument (with detailed product rules laid down only in a second stage via implementing measures – please see Box 2 on *Architecture of the future SPI instrument*, section 7.3 and Annex 6), the decision to extend the scope is not in itself expected to have a direct impact on the sectors concerned. Rather the effects will be felt following the adoption of the SPI measures for particular products or groups of products, which in all cases will be preceded by thorough analysis, consultation with stakeholders and impact assessment.

In the case of all three sub-options, the order of product (or service) prioritisation will be decided based on specific criteria, similar to those already foreseen in Article 15 of the current Ecodesign Directive, such as their environmental, energy and social impacts and related potential for cost-

¹³¹ Building Automation and Control Systems; Electric kettles (*currently in the legislative process*); Hand dryers; Lifts; Solar panels and inverters; High-pressure cleaners; Gateways (home network equipment); Mobile/smart phones and tablets (*currently in the legislative process*); Base stations.

¹³² See for example (SWD(2019)91); see also additional details in Annex 9.

effective reduction of these impacts¹³³. The selection will follow a fully transparent process culminating in (multi-annual) work programmes outlining the priorities for the development of SPI measures. These SPI measures will set out product/service-specific requirements, or requirements for a wide group of products (if sub-option 3b is retained), following an analysis of the product/service group in question and an impact assessment of the proposed requirements.

Under sub-option 2a: Extension to a limited number of priority products, a targeted extension of the Ecodesign Directive, to a *limited* number of priority products¹³⁴, is envisaged. The products in question have been identified taking into account their **sustainability credentials** as well as their **general potential for improvement** from a sustainability point of view, including their circularity potential. This builds notably on the results of a series of studies detailed in the annexes.^{135,136}

Following analysis based on the above-referenced sources, a key final decision criterion for inclusion of a product in the priority list was the **extent to which their sustainability dimensions are already covered, or capable of being covered, by existing EU level instruments**. While e.g. *certain* environmental impacts of some of the products included in the priority list are covered through existing EU level legislation (see *Annex 9* as well as *Annex 14*), **those for which significant regulatory gaps vis-à-vis sustainability dimensions still exist have been included**.

Based on the above, this sub-option proposes to extend the scope of the current Ecodesign Directive to enable the adoption of SPI measures for the following product categories (*further justification for each of the below is set out in Annex 9*):

- Energy related products (including means of transport¹³⁷);
- Textiles;
- Furniture;
- High impact intermediary products;
- Chemicals¹³⁸.

As previously mentioned, detailed impact assessments will precede the adoption of any SPI measures for the above-mentioned products. SPI will only intervene for issues that no other instrument is addressing or addressing sufficiently.

Together, throughout their lifetime, the option 2a products are estimated to cover an additional 14% of GHG emissions, 38% of human toxicity impacts and 15% of primary energy consumption compared to the baseline as discussed in Annex 10. In total, including the baseline, the SPI would cover 63 % of

¹³³ Annex 16 sets out the criteria and process for prioritisation of products, building on the approach in Article 15 of the Ecodesign Directive. Application of this prioritisation would lead to an assessment of the value added for different product groups.

¹³⁴ This excludes food and feed as defined in the General Food Law (Regulation EC 178/2002) and raw materials, except as intermediary products for the production and use of goods that are placed on the market.

¹³⁵ See details on the findings and sources that have been used to identify these priority products in *Error! Reference source not found.* (section *Error! Reference source not found.*). Annex 10 illustrates that for most environmental impacts, the products theoretically covered under Ecodesign (BAU) make up a sizeable fraction of EU-wide environmental impacts, while the addition of the product groups in sub-option 2a would further increase the coverage considerably, indicating that they are highly relevant for a wide range of environmental impacts.

¹³⁶ This impact assessment excludes food and feed as defined in the General Food Law (Regulation EC 178/2002), which are addressed through the Farm to Fork Strategy and raw materials as final products, meaning that raw materials are included only when they are embedded in other intermediate or final goods in scope of SPI.

¹³⁷ This corresponds to the product coverage of the Ecodesign Directive, with the addition of means of transport, which are energy-related products but currently excluded from Ecodesign scope.

¹³⁸ Understood as intermediate products (e.g. industrial solvents) or final products e.g. such as detergents or cosmetics. Where chemicals are destined/used for food related purposes and are not considered as food or feed, they will be subject to the relevant sectoral legislation, including the future sustainable food systems framework legislation, as announced in the Farm to Fork Strategy

GHG emissions, and 66 % of primary energy use and 60 % of human toxicity impacts resulting from European consumption¹³⁹.

Sub-option 2b: Extension to all physical goods would allow for the possibility, in principle, of adopting SPI measures for any physical good placed on the EU market¹⁴⁰. As under sub-option 2a, such measures would only be adopted based on clear criteria, for instance where significant improvement potential from a sustainability point of view can be identified. As under sub-option 2a, this would only take place when EU sectoral legislation does not provide for requirements on similar product parameters or is not capable of achieving the objectives of sustainability pursued by SPI. The SPI multiannual working plan and preparatory studies for specific SPI measures would allow for this assessment, and for prioritising products based on their estimated environmental, economic and social impacts. In practice, the first priorities would likely be the products identified under 2a, based on an assessment of potential value-added¹⁴¹: but this sub-option leaves flexibility to also cover other products not included in 2a, including through horizontal measures. Articulation with other EU level legislation would follow the same principles as under 2a.

This sub-option was also developed taking into account the experience and limitations of the current Directive, and the likelihood that novel products will emerge in the future whose impacts are as yet unknown: sub-option 2b therefore provides for more future-proof legislation, capable of responding to the evolution of products and our understanding of them, and present the added value of not requiring a revision of the overarching legislative framework, should action need to be taken for new or future product categories. It would therefore lessen the likelihood of problematic regulatory gaps, such as those that currently exist, occurring in the future, by helping to prevent situations in which justified action at EU level is inhibited from taking place (as is currently the case). It was also developed with the internal market objective of this initiative in mind, given that a broader product scope would increase the potential of having harmonised rules where the need for regulatory action emerges, thus decreasing potential fragmentation.

Based on best current estimates, throughout their lifetime, the products considered under option 2b *could* cover an additional 16% of GHG emissions, 42% of human toxicity impacts and 18% of primary energy consumption compared to the baseline as discussed in Annex 10. In such a case, including the baseline, the SPI would cover 65 % of GHG emissions, and 69 % of primary energy use and 64 % of human toxicity impacts resulting from European consumption¹⁴². It should nevertheless be underlined that, given the wide scope of this sub-option, and the possible emergence of novel products with as yet unknown impacts, the full coverage potential of this sub-option cannot be calculated with accuracy and may be higher than the above-mentioned figures.

Under sub-option 2c: Extension to services, SPI would be extended to cover services (in addition to all physical goods), and their significant environmental impacts. Services have been considered under a separate sub-option due to their specificities compared to physical goods: the inclusion of services follows a different logic from goods as they do not necessarily imply the transfer of a physical article. Nonetheless, service provision often relies on infrastructure and on products which have their own environmental impacts. Services may either be provided in the context of goods so that sustainability features of that good could become relevant (e.g. “product as a service” or services incidental to manufacturing), or rather based on equipment and personal skills of the service provider (e.g. repair service, advisory service).

¹³⁹ As modelled in the SPI Impact Assessment Supporting Study.

¹⁴⁰ As mentioned, this would nevertheless exclude food and feed as defined in the General Food Law (Regulation EC 178/2002) and raw materials, except as intermediary products for the production and use of goods that are placed on the market. Where justified, a limited number of other product exemptions may also be required (e.g. military equipment). For a more detailed description of the potential product coverage and the interaction with existing product specific legislation, please see Annex 14.

¹⁴¹ Annex 16 sets out the criteria and process for prioritisation of products, building on the approach in Article 15 of the Ecodesign Directive. Application of this prioritisation would lead to an assessment of the value added for different product groups.

¹⁴² As modelled in the SPI Impact Assessment Supporting Study.

Option 3: Extension of sustainability requirements for products

The existing Ecodesign Directive provides for the setting of generic or specific requirements on the energy efficiency and other environmental aspects of energy-using products. In order to achieve the objectives of this initiative, in particular specific objective 1 to ‘Improve products sustainability’, these requirements will need to be complemented or reinforced.

The three sub-options retained to respond to this are: **3a)** enhanced sustainability requirements; **3b)** far-reaching sustainability requirements, and **3c)** bans on some products. The sub-options are cumulative: all measures included in sub-option 3a are also part of 3b and 3c; all measures included in sub-option 3b are also part of sub-option 3c.

The sub-options have been divided according to the following logic: sub-option 3a *reinforces requirements* of the existing Ecodesign Directive. Sub-option 3b *goes further beyond* the scope of the current Ecodesign Directive (e.g. by including measures enabling the remanufacturing of components and the setting of due diligence requirements in relation to specific human rights risks along the value chain of products). Sub-option 3c includes all measures presented in sub-option 3a and 3b, and *in addition* would include the possibility to introduce explicit prohibitions on some products.

Under sub-option 3a: Enhanced sustainability requirements, requirements to strengthen the environmental sustainability of products would be set, via SPI measures specific to individual product categories. Requirements would be set as appropriate to the product and would build on those possible under current Ecodesign rules.

The enhanced requirements would focus in particular on extending products’ *durability or reliability* (where e.g. a minimum life duration for a product’s use phase, or minimum reliability - e.g. expressed as Mean Time Between Failures - could be set), as well as ensuring their *reparability and upgradeability* (building on existing requirements under Ecodesign in relation to disassembly and spare parts and going further, e.g. requiring modular design, or a specific choice of materials to be used in a product). The requirements would also seek to *restrict substances in products that hinder circularity* (such as substances that inhibit recyclability, upgradability, durability etc.), *set minimum levels of recycled content in products* (or in their components), *reduce carbon and environmental footprint* (e.g. based on a full life cycle assessment of the product, possibly defined and calculated using the Environmental Footprint methods) and *enable high-quality recycling* (e.g. by restricting the variety of alloys in a product, so as to enable high-purity sorting).

The choice of which requirements to apply will be decided on a product by product basis, with no commitment to apply a type of requirement for all products. Through consideration in the preparatory studies (as discussed in Annex 16), they will be impact assessed in order to make sure that requirements are appropriate and proportionate.

Sub-option 3b: Far-reaching sustainability requirements would build on measures under sub-option 3a, and in addition introduce the possibility of setting *horizontal requirements, applicable to large groups of products sharing common characteristics* (e.g. minimum recycled content), in the same SPI measure, as well as requirements to further boost *re-manufacturability* (such as requiring availability of a Bill of Materials, mechanical drawings / 3D printing files, software code etc.).

This sub-option is also intended as a more complete response to the working concept of ‘sustainability’ used for the purposes of this impact assessment (and set out in section 2), given that it encompasses not only the environmental but also the *social* dimension of sustainability, via concrete product requirements. It would allow for the setting of *due diligence requirements in relation to specific social or human rights risks – where such risks are identified at the level of the product* (for example, linked to the specific materials, components or production processes *of the product itself*). This empowerment is intended to be used where an SPI preparatory study identifies such specific risks and finds that other instruments, in particular the Sustainable Corporate Governance initiative (SCGI), are not in a position to sufficiently address them alone. The aim is to progressively reduce the risk that products available on the EU market are linked to human rights violations - identified on a product-per-product basis as most relevant for products’ individual supply chains. Where specific risks exist for certain products that are not sufficiently addressed through existing instruments,

product-specific due diligence obligations will be able to ensure due diligence efforts are undertaken by the companies placing on the market a product linked to those risks. SPI due diligence requirements would be formulated with a view to ensure that companies already having due diligence systems in place are able to integrate compliance with SPI due diligence obligation into their overall system.

Sub-option 3c: Bans on some products would build on sub-option 3b, by also including the possibility to *prohibit the placing on the market of some products, or products containing certain materials*. This would build on what *de facto* happens with the current Ecodesign Directive¹⁴³, by explicitly allowing for such a possibility, in cases where a set of clear criteria (to be defined in legislation) are met (see *Annex 9: Policy Options and Measures*).

Option 4: Sustainability information for consumers and B2B

In order to achieve the objectives of this initiative, in particular specific objective 2 to enable ‘Better access to sustainability information along the supply chain’, the following three sub-options have been retained for assessment: **4a)** enhanced information requirements; **4b)** the establishment of a European digital product passport at product group level; and **4c)** generalised application of a European digital product passport for all products in scope. The sub-options are cumulative: measures considered in sub-option 4a are also part of sub-options 4b and 4c. Sub-option 4c builds on sub-option 4b by complementing Measure 4b.1.

Sub-option 4a: Enhanced information requirements would create an obligation for those responsible for placing products on the EU market to make available the information necessary for consumers and economic operators along the value chain. The information requirements would, to the extent possible, reflect the sustainability requirements to be set for products under sub-option 3a, and where needed go beyond this¹⁴⁴. Requirements, including the way the information should be made available, would be defined in SPI measures. This means that information requirements could be placed on the durability or reliability of the product or its components (e.g. taking the form of a requirement for a durability index, with classes of durability or reliability), on the product’s reparability and upgradability (e.g. taking the form of a requirement for a reparability score), on the presence of substances of concern in the product and their tracing, on the recycled content in the product or its components (e.g. setting an open requirement to communicate recycled content levels, where a minimum requirement in that respect is not feasible), as well as the product’s environmental impacts along the life-cycle (e.g. reflecting a requirement set in this respect, at process level or for the full life cycle, or setting an open requirement to communicate life-cycle environmental impacts, possibly in the form of a product’s ecological profile¹⁴⁵). Building on the latter, this sub-option would also allow for information requirements to be set in the form of classes of performance (i.e. the establishment of categories of product performance, to enable comparison of an individual product with other similar products on the basis of their environmental performance, in addition to functionality or price alone) and possibly displayed in the form of a label, in a manner similar to how the energy label allows for the setting of energy classes (for the articulation with the energy label and EU Ecolabel, please see Annex 14; for the articulation with Consumer Empowerment and Green Claims, please see section 7.9 and Annex 14).

In addition, this sub-option would enable the adoption of SPI measures to require information on a *set of social indicators*. These will be based on an assessment of social aspects in the value chain of products, with a view to identifying hotspots (i.e. points along the value-chain that may have

¹⁴³ The Ecodesign legislation does not lead to banning products as such (neither materials nor technologies): it sets requirements to be respected in order for the products to be placed on the market. Products not meeting these requirements are *de facto* excluded from the market, unless their design is revised and improved to meet the requirements.

¹⁴⁴ Some measures will be implemented in synergy with measures foreseen in the Impact Assessment of the “Empowering consumers for the green transition” initiative and the “Green Claims Initiative”. See *Error! Reference source not found.* for details.

¹⁴⁵ As provided in Annex I, Part 3 of the Ecodesign Directive. This has never been implemented so far: a review of the ecological profile definition and the use of e.g. the Product Environmental Footprint method could facilitate its implementation.

significant positive or negative social impacts). The specific set of social indicators would be established within the product specific SPI measures, in close coordination with relevant existing legislation (see Annex 14).

Sub-option 4b: European Digital Product Passport (EU DPP) goes further and would require that, in addition to any information to be provided in physical format under sub-option 4a, the information requested should be made available via a *European Digital Product Passport*. The EU DPP would not automatically replace the information provided to consumers on printed labels. This is particularly important for the digitally excluded. It will rather complement this information and be more permanently available than tags or packaging that are removed after purchase. Moreover, the EU DPP would include a limited number of information requirements, common to all products, allowing extended visibility along the value chain (tracking & tracing information). Therefore, the EU DPP would consist in a structured collection of product-related data (with clear data ownership and access rights), and would be linked to products via a unique identifier (unique to each individual product or set at batch/model level). When relevant and appropriate, the EU DPP would also include dynamic data, thus allowing the collection and storage of product-related data along the entire lifecycle of the product. The data in question should reflect the data required under sub-option 4a (i.e. including the classes of performance), and where justified go further, e.g. requiring information on the product's origin, status, and other specific attributes. In addition to better informing consumers¹⁴⁶ and supply chain actors, the EU DPP would also be intended to facilitate customs and market surveillance authorities in their enforcement duties. The EU DPP requirements would be set out through the SPI measures, which would also determine the products in scope (see Annex 18 for more details).

It should be underlined that, while it will be possible to lay down certain key elements governing the EU DPP in the main SPI legal instrument, it will be necessary to complement these with more targeted technical precisions and details – e.g. adjusted to the needs of a particular product group – when laying down SPI measures in a second stage. For example, certain high-level principles – such as the need to connect the product passport to a unique identifier via a data carrier; the need to ensure this data carrier is physically present on a product/its packaging; and the need to ensure that all data included in the passport is written in standard, open, interoperable format etc. – are generally agreed on, and their inclusion in the main legal text is therefore likely to bring added value and clarity. The more technical solutions related to IT infrastructure and how the DPP will operationally work should be developed through global open standards. Other dimensions – such as where exactly the data carrier should be present on a given product; the type of data that should be accessible, and to whom (taking into account the data that may be particularly relevant, or sensitive, for a given product category) – are likely to require detailed examination, on a product-specific basis. These would be more appropriately laid down in a second stage, via SPI measures. The exact content of the information to be included in each product passport also merits consideration in a second stage, so that product-specificities can be adequately taken into account: while information content requirements may therefore vary across product groups – depending on the information deemed most relevant for a given product – products belonging to the same product group will have the same DPP information requirements, to be calculated and reported in the same way. For example, while DPP information requirements for washing machines and sofas will vary (given their different functionalities), requirements set for washing machines will be common to all of these products, and the same is true for sofas.

Also under this sub-option, synergies with existing chemicals and waste legislation would be built on, by *linking to the extent possible information requirements, where they relate to substances of concern, and the Substances of Concern In Products (SCIP) Database* (which implements Article 9 (1) (i) of the Waste Framework Directive), to ensure complementarity and reduce administrative burden for stakeholders. In particular, the EU DPP could include links to SCIP data and this would

¹⁴⁶ The provision of information to consumers under this option would be done in synergy with the measures foreseen in the Impact Assessment of the “Empowering consumers for the green transition” initiative. See Annex 9 for details.

reinforce the availability of information relevant to the management of chemicals and recycled materials, and be especially relevant for waste managers.

Sub-option 4c: Generalised European Digital Product Passport includes measures of sub-options 4a and 4b. The difference is that, under option 4c, there would already be in the main legal act, specific provisions identifying horizontal requirements (such as on governance, stakeholder obligations, technical features etc.) and a list of cross-sectoral attributes that each product in scope shall include in its EU DPP at the time of being placed on the market. The legislation could if needed provide for a differentiated schedule of EU DPP application, to take account of the various levels of complexity of its implementation for different products.

Option 5: Reward more sustainable products through incentives

In order to achieve the objectives of this initiative, in particular specific objective 3 to ‘Incentivise more sustainable products and business models to improve value retention’, this Option looks to reward more sustainable products. The sub-options retained for analysis are **5a)** enhanced incentive measures; **5b)** linking incentives to performance; and **5c)** consumption-oriented incentives. The sub-options are cumulative¹⁴⁷ and each correspond to an increasing level of ambition as well as complexity, while building on the information requirements and classes of performance developed under Option 4. Sub-option 5a and 5b build on already-existing national and EU-level mechanisms (e.g. Member States incentives; Green Public Procurement; Extended Producer Responsibility schemes), while sub-option 5c proposes a set of innovative instruments, which have not been implemented to date. All incentives considered under Option 5 need to be implemented in a way to avoid discrimination between the goods produced in the EU and imported goods.

Sub-option 5a: Enhanced incentive measures focuses on enhancing existing reputational and economic incentives, encouraging Members States to reward products based on their sustainability performance, **making use of the classes of performance developed under sub-option 4a**. This would be supported by the provision of *guidelines* including exchange of best practices and training between/for public authorities.

To boost demand for sustainable products, this sub-option would also include **mandatory Green Public Procurement (GPP)** requirements, to be set out in product-specific SPI measures that would go beyond the minimum requirements for placing products on the market. This would mean that, when contracting authorities and contracting entities are procuring products covered by an SPI measure, they would be obliged to follow a set of mandatory criteria (award criteria or technical specifications) in their procurement procedures in order to ensure the environmental and social impacts over the life-cycle of the product(s) in question are considered, with a view to ensuring that those finally selected have minimal negative impacts.

Sub-option 5b: Linking incentives to performance requires Member States - if they provide incentives for products covered by an SPI measure - to **target those incentives at the highest performance classes** in the same way that incentives for products with an energy label should target the products at the highest two significantly populated classes of energy efficiency. This has precedents, for example national taxes on vehicles where the vehicles are incentivised (or disincentivised) according to their emission class¹⁴⁸. This sub-option would also include the possibility to require Member States – through product specific SPI measures – to **modulate fees** paid by producers in the context of existing or new extended producer responsibility schemes **according to the performance class of the relevant products**.

¹⁴⁷ Except for measure 5b.1, which is alternative to 5a.1 – please see Annex 9

¹⁴⁸ There is also the case of the EU Energy labelling framework regulation that states that “where Member States provide incentives for a product specified in a delegated act, those incentives shall aim at the highest two significantly populated classes of energy efficiency, or at higher classes as laid down in that delegated act.”

Sub-option 5c: Consumption-oriented incentives would involve a *bonus for EU citizens who reduce their carbon footprint*. For each product covered, the environmental profile of a ‘representative product’ would be made available. Each product in scope would be assigned a carbon footprint score according to the methodology that will be selected and in full compatibility with other legislative instruments, and included in the European digital product passport (EU DPP). When the product is purchased, the bill would give the difference between the carbon footprint of the ‘representative product’ and the product bought. At the end of each fiscal year, each household could calculate the amount of carbon “saved” and Member States would then be allowed to compensate each of them proportionate to the amount of carbon saved (e.g. through eco-cheques or other financial incentives).

In addition, this sub-option would introduce *an excise proportional to the life cycle environmental performance of the products placed on the EU market*. The EU-level excise - calculated on the basis of the environmental performance of products- would be levied on the products placed on the EU market, irrespective of where they are produced. It would need to be first implemented at the pilot level for a few strategic products.

Option 6: Measures for circularity and value retention

In order to achieve the objectives of this initiative, in particular specific objective 3 to ‘Incentivise more sustainable products and business models to improve value retention’, this Option looks at measures for circular business models and value retention, in addition to those measures in Options 3, 4 and 5 which contribute already to circularity and value retention (for example requirements on reparability or product passport). The sub-options retained for analysis are **6a)** Promotion of value retention and value maximisation; **6b)** Enhanced value retention and value maximisation. All measures included in sub-option 6a are also part of 6b.

Sub-option 6a: Promotion of value retention and value maximisation would include the provision of *guidelines on supporting Circular Business Models* (CBM): such as product-as-a-service, maintenance, repair, re-furbishing, re-manufacturing, reverse logistics upgrading, and collaborative and/or sharing economy. The guidelines would present existing EU-level instruments and share best practices from national programmes, such as financial and technical support, reduced VAT rates for repair services, material brokerage services, public procurement, identification of circular opportunities and target setting. The guidelines could be used in combination with venture capital funding of the European Innovation Council (EIC) fund in projects eligible for the EIC accelerator supporting specific types of CBMs.

The Guidelines would be supported by an *EU-wide hub supporting the uptake of circular business models*, channelling information and services including awareness raising, cooperation, provision of training, exchange of best practices, etc. This could follow the model of a one-stop shop that gathers existing information and services hosted / managed by other programmes and agencies at the EU and Member States level.

Sub-option 6b: Enhanced value retention and value maximisation would go further and introduce an obligation for economic operators to disclose information on the destruction of unsold consumer products as a dis-incentive for this practice, and would introduce a *ban on the destruction of unsold consumer products*, via secondary legislation (SPI measures). This would include the prohibition of the destruction of returned/unsold products (making them instead available for donation, (re)sale or remanufacturing). The SPI measures would also determine possible exemptions to the ban on the destruction of unsold products (e.g. if justified for health, safety, quality or other reasons). In order to facilitate enforcement and dis-incentivize circumvention of such measures, they will be accompanied by ‘light’ transparency obligations, obliging economic operators to disclose - in a manner appropriate to their business environment - information on the fate of unsold products, in cases where they are

destroyed under applicable exemptions. Similar measures are already implemented in some Member States, for instance France and Germany¹⁴⁹.

Option 7: Strengthened application of the Ecodesign framework

In order to achieve the objectives of this initiative, in particular specific objective 4 to ‘Improve application of sustainable product legislative framework’, this Option considers sub-options to strengthen the application of the Ecodesign framework: **7a)** Improve the current framework to increase efficiency; **7b)** Strengthen market surveillance of EU Member States; and **7c)** Reinforce EU level implementation and complement Member States' market surveillance. The sub-options are cumulative: all measures included in sub-option 7a are also part of 7b and 7c; all measures included in sub-option 7b are also part of 7c.

The three sub-options progressively extend the number of actors directly involved: the first (7a) focuses on improving the processes leading to the adoption of SPI measures; the second (7b) focuses on better enforcement, with measures that focus on market surveillance; and the third (7c) proposes a model under which the European Commission is provided with executive capacities, to prepare SPI measures and to support and complement Member States in fulfilling their role.

Sub-option 7a: Improve the current framework to increase efficiency would focus on improving processes leading to the adoption of SPI measures. It would include measures such as *streamlining of the procedures* for the development and adoption of implementing regulations (changes in sequencing; ensuring information is collected efficiently; etc.). It would also introduce the possibility to *collect data from manufacturers and retailers* regarding regulated products sales and usage. The collection of sales data is part of the preparatory studies. Collecting them directly from manufacturers or retailers would allow for better estimation of market penetration of product types linked to sustainability characteristics at EU level, better informing the studies for the revision of product specific regulations. Trade secrets and other confidential information would be treated in a confidential manner. The sub-option would also expand provisions related to *third parties in conformity assessment* procedures to provide an extra safeguard for the correct application of those requirements to which they are applied, thereby increasing compliance and ensuring the availability of complete and verified documentation.

Sub-option 7b: Strengthen market surveillance of EU Member States would focus on better enforcement, with measures concentrating on market surveillance to ensure the effectiveness of all rules SPI, will set and ensure a level playing field for economic operators. The measures foreseen aim to take account of the specific challenges associated with enforcing sustainability requirements on products (rather than the challenges associated with enforcing product legislation as a whole). Specific measures would include: *making relevant product information digitally available to market surveillance authorities* (MSAs) and possibly to Customs authorities; providing *structural technical support to improve cooperation between MSAs and ensure they have sufficient capacities*; organising *common trainings for staff of notified bodies, notifying authorities and MSAs*; *publishing MSA penalties decisions*; creating a *benchmark and a reporting obligation for Member States* and establishing *requirements for market surveillance checks*.

While sub-options 7a and 7b would rely on the strengthening and reinforcement of existing capacities, **sub-option 7c: Reinforce EU level implementation and complement Member States' market surveillance** would allow the European Commission, where needed and appropriate while respecting the principle of subsidiarity, to organise and carry out *complementary market surveillance*. This

¹⁴⁹ « Loi anti-gaspillage », <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759?r=C3q8dVQuQS>. The German Federal Government has agreed on a draft bill amending the Circular Economy Act (Kreislaufwirtschaftsgesetz, “KrWG”). Germany intends to introduce a so-called “duty of care” (Obhutspflicht) which will require distributors in case of distance sales to ensure that the goods remain usable if returned by the customer and do not become waste.

could be supported by reinforced **product monitoring and testing capacity** at European level¹⁵⁰, to assist with both upstream definition of product requirements and downstream market surveillance. There would also be a **third party channel for market surveillance** so citizens can report suspected cases of non-compliance. Finally, there would be **assistance to implementation for suppliers and MSAs** provided by a central EU level service (going beyond the current assistance that can be provided by the services of the European Commission in charge of Ecodesign), answering specific queries through non-binding advice, but also in the form of trainings and presentations for stakeholders, to facilitate the correct understanding and implementation of rules.

Discarded measures

Three measures are discarded and not analysed further in the main report. See also *Annex 9: Policy Options and Measures*.

Firstly, to have far reaching value retention and value maximisation in the form of **an obligation for companies to take back, or donate for use, unsold products** and to introduce detailed reporting requirements on the fate of unsold goods to foster greater transparency (this would have been a measure under Option 6). This would require creating dedicated registries in Member States for specific product groups to monitor the quantities of unsold products, leading to administrative burdens that are significantly higher than what results from the transparency obligation proposed under option 6b. It would also set obligations on relevant actors in the value chain (e.g. producers, importers, retailers) of all consumer products to take back or donate for use unsold products and to monitor and report their quantities to national relevant authorities. As a measure that is generally applicable to all products covered by the SPI scope, it would lead to considerable administrative burden, including for economic operators in supply chains for which destruction of unsold consumer products might not be prevalent. Overall, this measure seems to largely duplicate the ban on destruction, but in an inefficient manner.

The sub-option has been discarded at an early stage due to the costs and the administrative burden associated with it, which are not proportionate to the environmental and social benefits it could generate.

Secondly, to put in place a **Sustainable Products Framework**: this would have been a measure of Option 3 (building on sub-options 3a, 3b and 3c). This would take a longer-term view by establishing an overarching *framework legislation*, including a legally-binding set of *sustainability principles*¹⁵¹ (intended to guide product design and foster sustainability and circularity of supply chains) and *long-term targets* for EU and Member States product policies, as well as requiring national implementation plans.

This sub-option has been discarded as it was concluded that the SPI instrument would not be best placed to ensure its effective implementation. For example, in order to fix and effectively implement the overarching *targets* foreseen, multi-layered policy intervention – including a combination of instruments active not only on the production but also on the consumption side – was deemed to be necessary. Even if it is expected that SPI rules will contribute to fostering more sustainable consumption choices in relation to products, it will remain a product-oriented policy tool, primarily capable of laying down rules at product level. It will therefore be unable to take the purely consumption-oriented measures that would be required for the success of this sub-option, such as to limit total amount of products produced/consumed in the EU. In addition, in order to be applicable to all products in scope of SPI, analysis indicated that legally-binding *sustainability principles* would need to remain relatively general in nature, leading to an increased risk from an enforcement perspective, including increased difficulty to verify product compliance and increased risk of non-

¹⁵⁰ E.g. relying, where necessary, on external laboratories, and acting in a coordinated manner with national market surveillance actors.

¹⁵¹ Such as the principle that all materials should be sustainably sourced, or that information on the environmental characteristics of products should always be made available (see *Error! Reference source not found.* for more details)

compliance. In addition, a substantial risk of diverging approaches being adopted across Member States – due to potentially different interpretations of the sustainability principles – was identified, raising concerns that the general objective of this initiative would be jeopardised. All in all, while it is envisaged that SPI will contribute to long-term current or future sustainability targets at national or EU level (such as EU climate targets), the scope and nature of the envisaged instrument are deemed unsuitable for implementation of the above-mentioned sub-option.

6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

6.1. INTRODUCTION

This section presents the analysis of the policy options described in the preceding section, and assesses how they contribute to reaching the specific objectives. Each policy option has three sub-options, except for Option 6. Overall, approximately 50 specific measures are analysed individually in Section 10 and 11, but are presented here in sub-options to keep the analysis manageable. More details are provided in *Annex 10: Impacts of the policy options* and *Annex 11: Comparison of the options*.

For each of these policy options this section includes a proportionate analysis of:

- economic impacts (positive and negative) including opportunity costs, compliance costs and administrative burden (for businesses and for public authorities)
- environmental impacts,
- social impacts,
- stakeholder views.

The analysis considers the sub-options in a given policy option in isolation (i.e. 2a compared to 2b, and to 2c) and does not at this stage consider the interaction between sub-options across options. This is considered reasonable as the options have been constructed to be largely independent, but an analysis of the synergies between them and hence of the **overall preferred option** is presented later.

6.2. ANALYSIS OF POLICY OPTION 2

Economic impacts

As outlined in the previous section, taking into account the expected architecture of the future SPI instrument, the decision to extend the scope of the Ecodesign Directive is not in itself expected to have a direct impact on the sectors concerned. Rather, the concrete impacts of the chosen sub-option will be felt at a second stage, as SPI measures are laid down for the products concerned. In general terms, however:

For **businesses** the extension of Ecodesign to the products identified for **sub-option 2a** is likely to entail price increases due to product improvements and would likely lead to a reduction in the demand for primary materials and new products. At the same time the demand for spare parts and repair services – and related business opportunities – may increase, following the provisions for recycled content and extended product lifetimes. Where the scope extension affects products placed on the market by SMEs, it is likely to entail an additional burden on these companies due to limited resources. Other SMEs, in particular the many active in value-retaining sectors such as repair, servicing and maintenance are expected to benefit from the widened scope (and associated requirements) foreseen under this sub-option. In all cases, however, the administrative burden on economic actors will depend on the stringency of products requirements (see Option 3).

Contrary to the products currently in scope of Ecodesign, **consumers** of non energy-related products would not experience savings through energy demand reductions, but rather in the form of fewer purchases of new products (because products can be kept longer in use). At the same time the expenditure for spare parts and repair services will likely increase.

For **public authorities**, administrative burden will increase under this sub-option, e.g. as the European Commission will have to develop the relevant SPI measures. The scope extension under option 2a would imply a doubling of the number of products effectively regulated as of July 2021: the additional administrative costs would equal about EUR 5.8 million per year for the European Commission. For Member States, the new requirements may entail additional administrative burden and costs relating to market surveillance and controls performed by customs. However, compared to sub-option 2a, this sub-option would present the added value of not having to revise the overarching legislative framework should action need to be taken for new or future product categories.

The market share is expected to increase by about 13% as a result of the addition of the remaining physical products in **sub-option 2b**. However, the remaining product groups would add 3% of European domestic final demand (compared to sub-option 2a, increasing it to 26% overall) and 2% of employment (again compared to sub-option 2a, increasing it to 24%)¹⁵². In practice, whilst the first priorities would likely be the products identified under 2a, this sub-option leaves flexibility to also cover other products including through horizontal measures. As such sub-option 2b could be implemented in a more proportionate manner. It is this increased potential for flexibility to respond to new opportunities and new information which allows sub-option 2b to score higher for efficiency than sub-option 2a.

Both sub-options 2a and 2b would apply criteria for prioritisation that include (see annex 16 for more detail):

- Contribution to meeting environmental, climate and energy targets and political priority, including EU international commitments;
- the environmental impact of the product along its life cycle (including resource use)
- energy consumption;
- whether there are significant differences in environmental impacts within the product group;
- the potential for improvement in terms of its environmental impact, energy efficiency and circularity aspects without entailing excessive costs (notion of affordability);
- social impacts along its value chain;
- economic benefits expected from the product improvement;
- EU added value, by producing results beyond what would have been achieved by Member States acting alone.

The economic assessment for **sub-option 2c**, which adds to the scope services on top of all products in sub-option 2b, is challenging. Adding services would extend the scope of Ecodesign dramatically, with an additional 52% of European domestic final demand (compared to sub-option 2b, increasing it to 78% overall) and 53% of employment covered (compared to sub-option 2b, increasing it to 77% overall)¹⁵³. The administrative burden is difficult to estimate for such a new measure (as for services so far only voluntary schemes exist). The impact would have to be assessed when looking at service-specific SPI measures.

In terms of impacts on the internal market, the broader the scope of the options, the bigger the potential to have harmonised rules that can avoid fragmentation. It should be borne in mind that the product scope of the Ecodesign Directive was therefore not restricted to specific categories of products but to all energy-related products. For this reason, sub-option 2b would have the potential to prevent fragmentation better than sub-option 2a and have the added value of not having to revise the

¹⁵² See Annex 10 for more details

¹⁵³ See Annex 10 for more details

overarching legislative framework should action need to be taken to address the environmental impacts of new or future product categories. Sub-option 2c would have an even higher potential (as it would cover services).

Environmental impacts

As shown in Figure 2, all sub-options would improve coverage of all the analysed environmental impact categories. The improvement in **sub-option 2a** would range between 4 and 16%. The largest increase in absolute coverage, and hence largest scope for environmental improvements would be emissions affecting human toxicity, airborne particulate matter concentrations and ecotoxicity. The increase in coverage of GHG emissions is around 7%. Nevertheless, for this and the other sub-options, until further assessment has been done it is uncertain how large the actual improvement potential is for each specific product. This means that it is undesirable to artificially restrict the product scope.

Due to the additional product groups included in the scope, **sub-option 2b** displays a slight improvement in terms of environmental impacts compared to sub-option 2a in all categories, ranging from 5 to 18%. However, the wide scope of sub-option 2b – which may in the future include novel products whose impacts remain as yet unknown – makes it impossible to accurately calculate its full coverage potential, which could be far higher than the above-mentioned figures. In terms of readying the EU to address possible future (as yet unknown) product sustainability challenges, and lessening the likelihood of problematic regulatory gaps occurring (as is now the case), this sub-option scores better in terms of efficiency and it is more suitable than sub-option 2a due to being more future proof. There would also be additional positive impacts from developing horizontal measures applying to the products groups not covered in 2a. In practice, under this sub-option, following a prioritisation exercise, the first product groups tackled would likely be those identified under sub-option 2a (as not all products will be tackled at once, rather turned into a workplan over a number of years).

The marginal environmental improvement potential of **sub-option 2c** appears higher again, ranging from 7 to 22%.

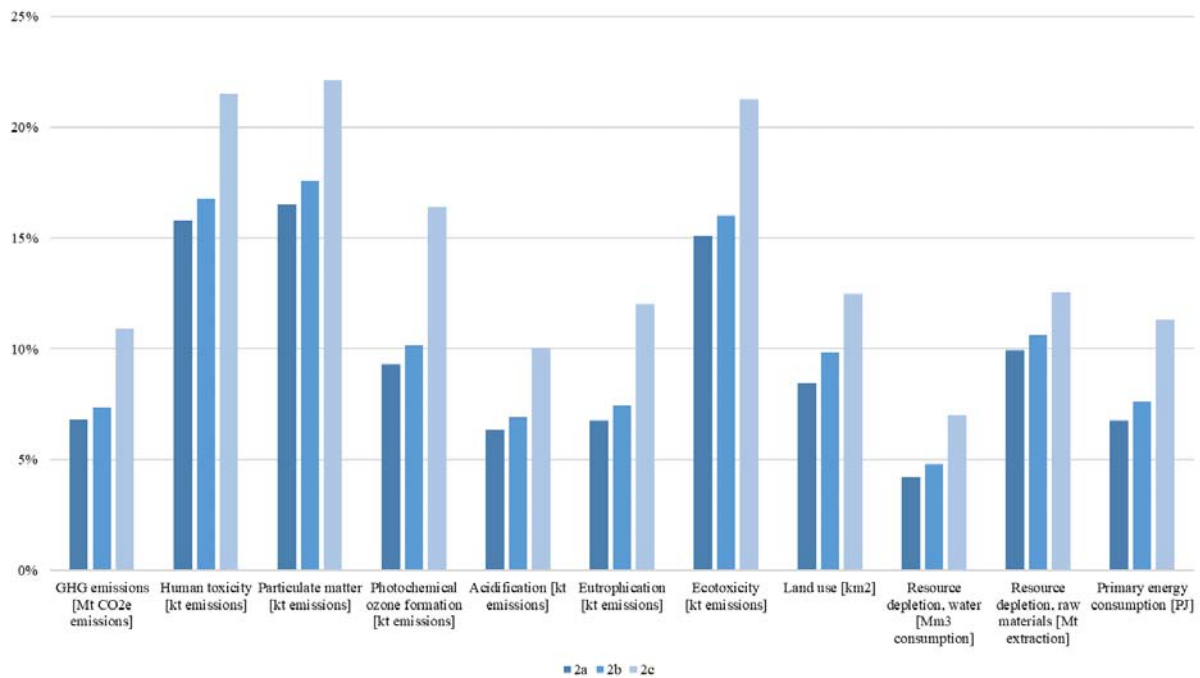


Figure 2 Yearly environmental reduction potential of the policy sub-options relative to baseline as percentages of EU totals; own calculations based on EXIOBASE v.3.8.1

Social impacts

Additional labour demand in the EU is likely to occur from the application of circular economy measures, e.g. in the recycling and repair sectors, but other job profiles could be affected (e.g. around extraction/import/management of raw materials). The impact would have to be assessed based on the exact requirements to be laid down under the product specific SPI measures.

Stakeholder views

Stakeholders showed some different views: while quite broad support for extension of the ecodesign instrument emerged from a number of stakeholder categories, some asked for the (initial) focus of SPI to be on the priority sectors of the CEAP, while others called for a broad extension to all products and for the future framework to retain flexibility so that updates to rules remain possible where needed. No particular support for extension to services emerged.

Industry representatives tended to cautiously support the extension of Ecodesign Directive in general, but many underlined the need to retain a product-specific approach if the needs and complexities of different sectors are to be taken into account. They called for individual assessments to be carried out before laying down concrete rules for each new product added to the scope.

In a dedicated workshop, **Member State** representatives expressed support for a wide SPI scope, while generally agreeing with the list of products suggested for priority action. They also felt the inclusion of services at this point in time would be premature. Other national level representatives – in particular Ecodesign practitioners from the public authorities – tended to be more conservative regarding the scope of Ecodesign: they considered that energy-related products have different features deserving different legislative tools to others products.

Stakeholders across the categories underlined the need to ensure synergies with existing EU legislation and avoid overlap on sustainability or design aspects, so as to avoid extra administrative burden. Enforcement within the single market and at the EU external borders and market surveillance activities (e.g. inspections or audits) are also viewed by all as necessary to accompany the implementation of the SPI: their robustness has an impact on how far to go to extend the scope.

In general, a majority of respondents to the Public Consultation, including **SMEs**, considered that products sold in the EU are not sustainable because there is no harmonised set of requirements to foster sustainable design of products – suggesting that a wider scope for the future regulatory instrument may bring added value.

Overall comparison

Table 2 Comparison of sub-options under PO2¹⁵⁴

| Overall comparison | Sub-option 2a | Sub-option 2b | Sub-option 2c |
|--|----------------------|----------------------|----------------------|
| Effectiveness in delivering specific objectives | ++ | ++ | +++ |
| Efficiency | ++ | +++ | + |
| Coherence | ++ | ++ | ++ |
| Overall economic impacts (including benefits) | +/- | +/- | +/- |
| Administrative costs for Commission and MSs | - | - | -- |
| Compliance costs for businesses | - | - | -- |
| Costs / Savings for consumers | +/- | +/- | +/- |
| Overall environmental impacts | ++ | ++ | +++ |
| Overall Social Impacts | +/- | +/- | +/- |

6.3. ANALYSIS OF POLICY OPTION 3

Economic impacts

For **businesses**, **sub-option 3a** will likely entail some increased *compliance costs*. These could be offset in part for businesses by costs passed to consumers (though these in turn are likely to be reduced in other ways – see below), and via a potential reduction in the overall number of products manufactured per year (due to more durable and reliable products). Importantly, the requirements under this sub-option are likely to support and encourage businesses in developing new revenue streams and avenues of business such as in repair, refurbishing and remanufacturing. Additional administrative burden can be expected, for example for provision of information for market surveillance. For public authorities, administrative burden will likely increase under this sub-option, e.g. as the European Commission will have to develop the relevant SPI measures. For Member States, the new requirements may entail additional administrative burden and costs relating market surveillance and controls performed by customs. For SMEs, there are indications that some of the product sustainability requirements foreseen under 3a could give rise to medium to high administrative or compliance costs, but that these may be offset overtime due to material savings, reputation benefits etc. (see ‘stakeholder views’). In addition, as the requirements under 3a are expected to increase the opportunities to further develop and harness the market for repair and refurbishment, this sub-option is likely to bring clear benefits for SMEs, as these are already predominant in these sectors. Consumers are expected to benefit positively from increased ease of reparability. Though the initial cost of new products could become higher, these additional costs are expected to be offset by extended product lifetime and/or lower usage costs in general. The impact assessments preceding adoption of detailed product rules will need to establish what costs are reasonable and proportionate from a consumer perspective, also taking into account the expected time

¹⁵⁴ See annex 10 for a more detailed breakdown of the scores

horizon for expected savings (e.g. from increased durability etc.) to take effect. While experience under the current Ecodesign Directive – where the cost increase in 2020 for Ecodesign products (21bn Euro) was about 5% of the total acquisition costs of these products (395bn Euro)¹⁵⁵ – is of interest, it cannot be said to be fully indicative of what may arise as a result of SPI rules, given its primary focus on energy savings. In addition, the time horizon for such a “break-even” point is product-specific and so are affordability aspects. Therefore the time horizon cannot be generalised and needs to be looked at in future impact assessments for detailed product rules.

Sub-option 3b would include all impacts listed above for sub-option 3a, though businesses have indicated (see *Annex 2: Stakeholder consultation*) that increased costs are likely to be incurred in particular for the measures relating to remanufacturing and due diligence. In relation to the latter, it should again be underlined that SPI will only take action where specific risks, at the *level of the product*, have been identified during preparatory studies, and where it is judged that these risks cannot be adequately addressed by other instruments – in particular the Sustainable Corporate Governance Initiative (SCGI). In essence this means that SPI will act as *lex specialis* to SCGI’s more horizontal rules (see Annex 14). As such, given the close alignment between the two initiatives that will need to be ensured, certain opportunities for alleviating unnecessary burden for companies can be foreseen – for example, via provision of sectoral guidance to ensure coherence, and by formulating SPI due diligence requirements with a view to ensuring that companies already having due diligence systems in place under SCGI are able to integrate compliance with SPI due diligence obligation into these. For **SMEs** (who will not be subject to SCGI due diligence requirements, but who may be subject to future SPI due diligence requirements, depending on the products they place on the market), separate dedicated analysis of appropriate and proportionate measures will be foreseen in the context of the impact assessments that will precede adoption of all SPI rules. When deciding on these rules, the Commission will take account of the size of the companies the rules will apply to and the proportionality of the compliance costs they entail. Whether such requirements are feasible and whether the envisaged benefits (e.g. for the environment, but also for competitiveness including for SMEs) weigh up against the costs will be decided on a case-by-case basis, based on product-specific information and analysis. These decisions will be made also with input from industry (including SMEs and their representatives). *Where justified* based on this, certain mitigation measures could be considered: for example, SPI due diligence obligations could exclude specific steps for SMEs, or adjust those steps to decrease the associated administrative burden, e.g. by simplifying the reporting step or adjusting the required deadlines or timelines (see annex 14 for more details). **Sub-option 3c** would include all impacts listed above for 3a and 3b, plus costs associated with explicit bans on some products or materials in products. Where this takes place, it could lead to costs for businesses and consumers, and restrict the choices available on the market. As such, these bans would need careful justification.

In terms of impacts on the internal market, sub-option 3a would have a positive impact by establishing clear requirements. Sub-option 3b would extend this to additional aspects and thus further reduce the risk of fragmentation through national rules. Finally sub-option 3c would ban certain products or materials, thus restricting their access to the internal market, which could be justified for instance if these products compete on unfair terms with more sustainable ones.

All the sub-options under 3, are designed to be flexible as a means to ensuring proportionality. For this reason, no minimum requirement or bans will be applied unless they are justified on the basis of analysis. The alternative would be, for example, to committing to setting minimum environmental or carbon footprints under all SPI measures, which could lead to disproportionate requirements.

Environmental impacts

Sub-option 3a would effectively reduce environmental impacts compared to the baseline scenario. Products will be less frequently replaced, and their inherent value would be better made use of. The

¹⁵⁵ [Ecodesign impact accounting annual report 2020](#)

possibility for consumers to choose unsustainable products would also gradually reduce. In addition, the option is expected to increase the demand of secondary raw material (thus reducing primary resource use and waste generation), and the measure on high-quality recycling also included in this sub-option will help to feed the supply required for this. Overall the environmental benefits of option 3a are expected to be significant.

Sub-option 3b include all environmental impacts mentioned above but goes further because of more ambitious sustainability requirements and greater efficiency in their application. Minimum requirements on remanufacturing¹⁵⁶ would contribute to further reducing life cycle impacts and will bring benefit in third countries as well as in the EU.

Under **sub-option 3c**, the possibility to prohibit certain products/materials with significant environmental impacts would have immediate impact, but clear criteria would need to be met to make use of this possibility.

Social impacts

Sub-option 3a could trigger a shift in employment from manufacturing sectors to repair and refurbishing sectors, and an increase in employment in the second-hand sector (repair, refurbishment, remanufacturing), likely requiring new workforce skills. It is possible that this could provide increased job opportunities, including for people from vulnerable social groups. It is also possible that vulnerable sections of society with limited purchasing power could face difficulties in purchasing more expensive new products, though it is expected that better durability and increased repair opportunities will compensate for this over time, and more second-hand products of better quality should also be available. As mentioned, the impact assessments preceding adoption of detailed product rules will need to investigate what is reasonable and proportionate in terms of price increases for consumers, taking expected savings over time into account.

For **sub-option 3b**, the additional social impacts compared to 3a are due to the introduction of requirements on due diligence (3b) and are expected to result in improvement of working conditions across the value chains, both within and outside the EU, in particular if relevant SPI measures synergise well with other related requirements (e.g. under related initiatives) and are well enforced. The minimum requirements on re-manufacturability will create additional jobs.

Sub-option 3c: The social impacts for this sub-option are similar in nature in some respects to 3a and 3b but of higher magnitude. The possibility of introducing prohibitions on certain products could affect certain citizen groups more than others (see Annex 10, case of incandescent lamps), even if the necessary preparatory procedures (including consultation process and assessment of impacts) would help to ensure that any action taken in this respect is justified and proportionate.

Stakeholder views

As outlined under sub-problem 1, most respondents to the Public Consultation agree or strongly agree that many products are not designed to be easily repaired or upgraded, though agreement levels vary across stakeholders, being much stronger amongst **EU citizens** and **environmental organisations** than **industry** representatives, for example. Building on this, there appears to be **overall support for establishing binding rules on actions to be taken by producers to improve durability, re-usability, upgradability and reparability**: 59% of all respondents support or strongly support this action, but once again support is far higher amongst EU citizens and environmental organisations (87% and 91% respectively) than industry representatives¹⁵⁷ (36% only). For SMEs, just over a half (56%) would support or strongly support it. Other measures with strongest overall support from stakeholders include prioritising design to facilitate easy repair, upgrade, remanufacture etc.; and restricting substances inhibiting circularity - even if levels of support for these measures varied across to stakeholder categories along the same lines as described above.

¹⁵⁶ Reuse and remanufacturing, while less meaningful than delayed replacement, may still deliver significant environmental benefits (-1.36% GWP; -1.40% RME; -0.33% LU; -2.33% (source donate et al.)

¹⁵⁷ Business associations and companies

The targeted stakeholder consultation exercise found that introducing minimum sustainability requirements on products (e.g. via a revision and extension of current ecodesign rules) is considered by some – in particular **NGOs** and **consumer associations** – as the most effective means of reducing products’ environmental impact, because not enough consumers are ready to pay more for sustainability. Some **industry** representatives expressed concerns about potential costs involved in testing such requirements (e.g., product lifespan or product environmental footprint requirements) and potential increases in the administrative burden (e.g. because of due diligence requirements). In general, however, corporate interviewees supported a product-specific approach to the requirements to be placed by the SPI and expressed readiness to comply with additional requirements, provided these are grounded in a robust prior assessment.

In a dedicated workshop, **Member State** representatives expressed general support for requirements under 3a, and were cautiously supportive of including the due diligence requirements foreseen under 3b, underlining the need to ensure coherence with other initiatives.

For **SMEs**, responses from a targeted survey of SME representative organisations suggest that while product sustainability requirements (such as those foreseen under 3a) may give rise to some negative impacts (such as medium to high administrative or compliance costs), these are likely to be offset over time due to factors such as reduced material use and expenditure, increased customer loyalty and increased reputational benefits etc. Compared to 3a, replies suggest that the impact of sub-option 3b on SMEs may be higher, due to the due diligence requirements it entails: while a fifth of survey respondents envisage that negative impacts of this measure could be offset over time with possible added value ensuing, just under a fifth point to the possibly high negative impact of this option for SMEs.

Further details on the above are set out in *Annex 2 and 10*.

Overall comparison

Table 3 Comparison of options under PO3¹⁵⁸

| Overall comparison | Sub-option 3a | Sub-option 3b | Sub-option 3c |
|--|----------------------|----------------------|----------------------|
| Effectiveness in delivering specific objectives | ++ | +++ | +++ |
| Efficiency | ++ | +++ | ++ |
| Coherence | +++ | +++ | +++ |
| Overall economic impacts (including benefits) | +/- | +/- | +/- |
| Administrative costs for Commission and MSs | - | - | -- |
| Compliance costs for businesses | -- | -- | --- |
| Costs / Savings for consumers | +/- | +/- | +/- |
| Overall environmental impacts | ++ | +++ | +++ |
| Overall Social Impacts | +/- | +/- | +/- |

¹⁵⁸ See annex 10 for a more detailed breakdown of the scores

6.4. ANALYSIS OF POLICY OPTION 4

Economic impacts

Sub-option 4a will require product manufacturers, suppliers, and importers to collect, store, and make available information. While some information required is expected to already be available to manufacturers and suppliers, it is possible that new information necessary to comply with SPI requirements will have to be generated. A digital product passport (as included in 4b and 4c) would streamline information sharing compared to the situation in 4a which does not include a harmonised digital infrastructure. Measure 4b.2 improves the provision of information requirements included in measure 4a.3, and ensures that tracing substances of concern is not duplicated between chemical and Ecodesign legislations. This should therefore result in higher efficiency for companies, limiting the risk of double reporting, and reducing their administrative burden.

An increase of costs for economic actors, compared to the baseline, can be expected for each of the three sub-options (see **Annex 11: Comparison of the options** for more details). SMEs, like other businesses, will have to face the cost of new information collection and reporting: for example, the respondents to the second targeted SME survey suggested that administrative and compliance costs associated with the requirement to provide information on the ecological profile of products could be medium to high for SMEs, even if there is a chance that these could be absorbed and offset over time. Option 4a would lead to a relatively higher administrative burden for **Member States** compared to the other two options, due to the lower level of harmonisation requirements related to which information to display and how to communicate it. The opposite would be true for **economic operators**, for which option 4b and 4c would lead to higher costs compared to 4a, as some of them¹⁵⁹ would need to set up an internal IT system to store the data to be made available through the EU DPP. However, this must be put in perspective with the overwhelming support, across all stakeholders (including SMEs) for a digital product passport and the potential reduction of administrative burden thanks to simplified compliance processes through the DPP. 42% of SME respondents expect higher economic return for EU businesses. In order to keep administrative costs for business and administrations to the minimum necessary, the DPP will have to rely as much as possible on already existing and used standards related to data format and transfer. Moreover, by linking the information included in already existing centralised database (e.g. EPREL or SCIP), the duplication of information provision and control would be avoided. The costs for the European Commission would be higher under sub-options 4b (and to a lesser extent 4c) due to the cost of deploying the necessary infrastructure to support the decentralised digital product passport, its supervision and ensuring the integration or coordination with existing EU databases. However, the EU DPP is expected to reduce the costs for market surveillance, also through possible synergies with the EU Single Window Environment for customs.

Under all sub-options, citizens will have access to a wider set of information than they currently enjoy when purchasing products. While the cost of providing information incurred by companies is likely to be transferred to the customer, they will be capable of choosing items that increasingly offer better value for money (longer lasting, easily repairable). Depending on their willingness to pay more for more durable products, consumers will see more or less benefit in the measure. According to a recent study, which measured willingness-to-pay based on information on reparability and durability, consumers will see the greatest benefits in large and expensive items. For other products such as clothing, the benefit is lower, but still positive.

In terms of impacts on the internal market, all sub-options create additional transparency facilitating well-informed choices, yet sub-option 4b would be more beneficial than 4a as it would allow market players to easily build on the information received digitally from others in the value chain and would follow more harmonised requirements. Sub-option 4b would also be more beneficial than 4c due to the importance of providing information that is specific and relevant to the products for which the EU DPP will be introduced.

¹⁵⁹ Many medium-large companies already have such systems in place.

Environmental impacts

The estimation of environmental gains that could be achieved through option 4, independently from the sub-option chosen, is as follows:

- Facilitation of more sustainable choices by consumers, thus reducing the overall impact of consumption
- Facilitation of the work of all players that intervene in the product lifecycle (maintenance, repair, recycling) due to:
 - 5% cost reduction of maintenance and repair¹⁶⁰
 - 4-25% increase in the maintenance and repair rates¹⁶¹
 - reduction in the number of durable goods being sold per year by 0.1 to 0.2%, and hence a proportional reduction of their environmental impacts upon production¹⁶²
 - increase in the quantity of high-purity recycled materials, leading to a potentially significant increase of the contribution rate of recycled materials to raw materials demand from 6% to 78% for plastics, from 13% to 84% for aluminium and from 24% to 81% for steel ¹⁶³.

For sub-option 4a, the generation, storage and display of information will require the use of material and energy, which will generate some negative environmental impact, especially in the case of digitalisation of information (which is expected to happen, even in the absence of a digital product passport). In addition to the environmental impact estimated in sub-option 4a, further impacts would be added to account for the infrastructure needed to operate the decentralised system needed to implement sub-options 4b or 4c. Several technologies are available, with variable impacts. Nonetheless, benefit may also outweigh the costs, especially for sub-option 4b.

Social impacts

As purchasing practices and production processes change towards more sustainability, there will be a shift in the workforce from declining sectors and jobs towards growing sectors. For example, repair services are expected to be boosted by the proposed initiative. This results in an increased need to re-skill the workforce and mitigate the territorial aspects of the economic transition.

The introduction of information requirements on social indicators are expected to help improving working conditions across the value chains, both in and outside the EU.

Stakeholder views

There is **overall support for the introduction of information requirements** to improve the situation compared to the baseline: approximately 58% of respondents to the public consultation (PC) agree or strongly agree that economic actors do not have adequate and reliable information on the sustainability of products – a view broadly shared amongst most **industry** representatives as well as by **EU citizens & consumer organisations**. On the producers' side lack of awareness of sustainable production practices and methods was mentioned. On the consumers' side, the lack of education among citizens on issues related to sustainability was mentioned as a barrier to making products sustainable. Further, lack of adequate information for example, on the embedded carbon footprint in materials was considered a challenge.

There is **overall support for the introduction of a digital product passport** (therefore going beyond 4a): when asked which information should be included in a digital product passport, each of the 17 propositions received a positive answer of between 46 to 90% of respondents to the PC.

In the PC, stakeholders were also invited to choose which were **the biggest challenges to a successful establishment and implementation of a digital product passport**. The results provide an

¹⁶⁰ Deloitte Environment et al. (2016) "Study on socioeconomic impacts of increased reparability"

¹⁶¹ SPI Impact Assessment supporting study

¹⁶² Deloitte Environment et al. (2016) "Study on socioeconomic impacts of increased reparability"

¹⁶³ SPI Impact Assessment supporting study. Based on end-of-life recycling input rates (EOL-RIR), Eurostat

insight into what they consider to be of critical importance. Interestingly, the cost and the (negative) environmental impact of a digital product passport came last (with 147 respondents choosing it). The two biggest challenges identified were: “managing the complexity of products and value chains and the quantity of data that is required to make such a passport effective” (count: 469) and “Ensuring the relevance and reliability of the information included in the passport” (count: 440)

Member State representatives who attended the different stakeholder workshops related to this topic expressed a general view that increased product information will be key for advancing the objectives of SPI, and that consumers should also be a key target here. The idea of a European Digital Product Passport (EU DPP) was well received by participants, but some cautioned that such a passport should not be overloaded with too much information, and that it should remain simple to understand, also for consumers. General support was expressed for the possibility of setting classes of performance for products, and attempting to reduce administrative burden for economic operators by exploring if certain obligations (e.g. in relation to chemicals tracing) could be reduced via integration with the EU DPP/SPI requirements.

SMEs expressed cautiously optimistic to mixed views on certain measures foreseen under 4a: in the survey of SME representative organisations, for example, more than half foresaw that the potentially negative impacts stemming from the requirement to provide information on the ecological profile of products would likely be absorbed over time and bring added value from a business point of view. Approximately one fifth, however, signalled risk of potentially high negative impact from this measure. SMEs expressed quite high levels of support for introduction of a digital product passport (sub-options 4b and 4c) across consultations, even if the potential for some additional burden was recognised: in the first SME survey, for example, approximately three times more SME respondents agreed or strongly agreed that introduction of a DPP ‘could contribute to higher economic returns for EU companies’ than those that disagreed or strongly disagreed with this statement. According to respondents to the second targeted SME survey, the four most likely impacts of its introduction were identified, in the following order, as: promotion of greater transparency along the supply chain; better knowledge of own supply chain; encouragement to consumers to opt for more sustainable products; and possible additional IT costs/administrative costs to access the market.

Overall comparison

Table 4 Comparison of options under PO4¹⁶⁴

| Overall comparison | Sub-option 4a | Sub-option 4b | Sub-option 4c |
|--|----------------------|----------------------|----------------------|
| Effectiveness in delivering specific objectives | ++ | +++ | ++ |
| Efficiency | + | ++ | + |
| Coherence | + | ++ | ++ |
| Overall economic impacts (including benefits) | +/- | + | + |
| Administrative costs for Commission and MSs | - | - | - |
| Compliance costs for businesses | - | +/- | +/- |
| Costs / Savings for consumers | +/- | +/- | +/- |
| Overall environmental impacts | ++ | +++ | +++ |
| Overall Social Impacts | +/- | +/- | +/- |

¹⁶⁴ See annex 10 for a more detailed breakdown of the scores

6.5. ANALYSIS OF POLICY OPTION 5

Economic impacts

Sub-option 5a may result in additional administrative burdens for economic operators as GPP and other pricing mechanisms typically require manufacturers to produce the information necessary to certify that their products meet the necessary requirements, as well as all operators along the value chain to keep the associated records and documents. In parallel, it will generate administrative burden for public authorities, in particular because of the need to monitor and enforce compliance with the new incentives and GPP requirements. The costs and the administrative burden for the European Commission to draft the legislative measure, the guidelines and supporting tools for the implementation of GPP in Member States are expected to remain limited. The direct economic impact for the more sustainable businesses and on contracting public authorities is expected to be positive. By sustaining demand for “greener” products, public procurement creates markets for environmentally friendly products and services. It also provides incentives for companies to develop innovative solutions with lower environmental impacts, creating markets and jobs, notably for SMEs. Depending on the product group, green public procurement can provide competitive advantage to environmentally-aware suppliers.

Sub-option 5b would reinforce the positive economic impacts identified for sub-option 5a, especially the increase of companies’ turnover offering sustainable products, but would also entail further costs for companies (e.g. setting up information collection process, including access to testing facilities and training) and administrative burden. The gains would exceed the expenditure, as numerous companies have established that qualifying for reputational incentives is beneficial despite its cost. The increase in administrative burden for Member States is higher compared to sub-option 5a due to the mandatory nature of measure 5b.1 (e.g. costs will also be incurred with monitoring uptake for the different products groups), however such costs are expected to remain limited in comparison to current product and waste statistics.

Similarly to sub-options 5a and 5b, **sub-option 5c** would imply an increased burden for companies, Member States and the European Commission. The administrative burden will increase significantly to manage, deploy and verify the three measures proposed, although a part of it could be offset for Member States with revenues from the excise duty under measures 5c.2. However, such measures have the potential to generate the largest negative impacts on companies, as the additional tax burden would unlikely be fully passed on to consumers.

In terms of internal market impacts, all sub-options would have a positive (and increasing from 5a to 5c) impact as they would lay down increasingly harmonised rules on how Member States would be able to incentivise the purchase of more sustainable products, thereby reducing the scope for national rules to fragment the internal market.

A more detail analysis of impacts on trading partners, citizens and SMEs for the three sub-options is provided in **Annex 10: Impacts of the policy options**.

Environmental impacts

Sub-option 5a is expected to have positive environmental effects compared to the baseline, in particular thanks to measure 5a.2: GPP is often identified as a tool that can address environmental problems such as deforestation, greenhouse gas emissions, water use, energy efficiency, waste, etc. As shown in Annex 10, for almost ten product groups frequently procured by public institutions in the European Union, the use of GPP produced a reduction of GHG emissions.

Sub-option 5b builds on sub-option 5a and is expected to generate larger positive environmental effects compared to 5a, due to the mandatory nature of measures 5b.2 compared to 5a.1. Moreover, Measure 5b.2 is expected to have additional positive environmental impacts: the literature reckons the effectiveness of Extended Producer Responsibility (EPR) schemes to address environmental goals and influence product design (e.g. reduced waste, increased recycling).

Sub-option 5c is expected to enhance the reduction of the environmental impacts more than under sub-option 5a and 5b. For instance, the excise duty, by encouraging companies to improve their product's environmental performance over its life cycle, is expected to generate effects similar to carbon taxation. When comparing Member States that have implemented a carbon tax with those that did not, it has been found that this mechanism has a positive and significant impact on stimulating the reduction of carbon emissions. A more detailed analysis is provided in **Annex 10: Impacts of the policy options**.

Social impacts

Sub-options 5a is expected to have positive effects in terms of job creation. Furthermore, economic and reputational incentives and GPP aim at influencing consumption habits and can assist consumers in drawing attention towards environmental impacts of products and services. However, the introduction of incentives may lead to price increases in the short term (if supply is inelastic), which are expected to decrease over time. Therefore, the issue of affordability of more sustainable products should be only temporary.

Sub-option 5b will significantly enhance the social effects identified for measure 5a.1. Incentives and eco-modulation in EPR schemes will be introduced at a faster pace, thus enhancing the job creation potential on the EU market in related fields, such as recycling or eco-design.

Sub-option 5c is expected to have a positive social impact as it would encourage a behavioural change leading to the selection of products of greater sustainability (measure 5c.1), while measure 5c.2, if accompanied by a shift of taxation on labour, has the potential to support the uptake of more labour-intensive and less resource-intensive activities, which would trigger job creation.

Stakeholder views

Overall, stakeholders express quite high levels of support for measures foreseen under **sub-option 5a**: in the Public Consultation, approximately 67% believed introducing mandatory Green Public Procurement criteria is either important or very important, with approximately 55% of **industry** representatives, 81% of **EU citizens & consumer organisations** and 58% of **SMEs** believing so. The second targeted SME survey appeared to confirm the results for this latter category, with 40% of respondents foreseeing a positive impact for SMEs from mandatory GPP criteria (6% foresaw either no or neutral impact and 9% potentially negative impact). In a dedicated workshop, **Member State** representatives also expressed cautious support for this measure, while underlining that mandatory criteria should be clear and easily applicable for procurements bodies, and should still facilitate innovation. They were supportive of the guidelines foreseen under this sub-option, indicating that additional information on successful economic instruments already in place in some EU countries would be useful.

Stakeholders also appear to have a positive view of measures linked to those under **sub-option 5b**: overall approximately 62% of Public Consultation respondents believed increasing transparency by identifying performance classes was important or very important, with this figure approximately 50% for **industry**, 74% for **EU citizens & consumer organisations**, and 59% for **SMEs**. Related to the latter, a majority of respondents to the second targeted SME survey indicated that linking incentives to classes of product performance may bring positive benefits for SMEs (with lower figures foreseeing either no or neutral impact - 11% - or potentially negative impact - 9%). **Member State** representatives also expressed support for this measure, even if the need to ensure smooth interaction with existing incentives was also underlined. High support for modulation of Extended Producer Responsibility schemes was also evident amongst stakeholders: overall approximately 66% of Public Consultation respondents supported or strongly supported it – around 58% from industry, 76% of EU citizens and consumer organizations and 64% of SMEs.

On sub-option 5c, though stakeholders tend to agree that the low cost of many products is a barrier to more sustainable product choices, some stakeholders (in particular Member State representatives) cautioned against extending the SPI instrument in this direction, given the risk of increasing complexity and questions surrounding legal base.

Overall comparison

Table 5 Comparison of options under PO5¹⁶⁵

| Overall comparison | Sub-option 5a | Sub-option 5b | Sub-option 5c |
|--|---------------|---------------|---------------|
| Effectiveness in delivering specific objectives | ++ | +++ | +++ |
| Efficiency | ++ | +++ | ++ |
| Coherence | + | ++ | ++ |
| Overall economic impacts (including benefits) | + | ++ | +++ |
| Administrative costs for Commission and MSs | - | -- | --- |
| Compliance costs for businesses | + | - | --- |
| Costs / Savings for consumers | + | ++ | ++ |
| Overall environmental impacts | + | ++ | ++ |
| Overall Social Impacts | ++ | ++ | ++ |

6.6. ANALYSIS OF POLICY OPTION 6

Economic impacts

Sub-option 6a is expected to generate positive -though limited- economic impacts, as the market for circular business is expected to grow. According to the analysis in **Annex 10: Impacts of the policy options**, the adoption of explicit policies to promote the circular economy will contribute to higher growth and employment levels in Europe by 2030. The provision of guidelines and the creation of an EU wide hub would incur limited administrative burden for economic operators, Member States and the European Commission. Economic operators as well as citizens would benefit from sub-option 6a measures to increase their knowledge on circular business models and they are expected to use them more frequently for their economic interactions.

Sub-option 6b, being cumulative to 6a, is expected to generate an additional increase in economic impacts as companies incur some costs relating to value chain management and stock management due to the ban on the destruction of unsold products and the transparency obligation. The measure may incentivize innovations to further prevent product surpluses by matching supply and demand, which could generate positive economic impacts. Compliance with the ban on the destruction of unsold products and the transparency obligation will lead to an increase in administrative burden (negligible in sub-option 6a) for economic operators. Limited impacts due to the transparency obligation are expected due to the flexibility provided to disclose required information by economic operators in a manner appropriate to their business environment, and because economic operators are likely to already keep an account of the number of unsold products they discard. Estimations (see **Annex 10: Impacts of the policy options**), by consulted industry associations, quantified a cost increase of less than 1% (estimated by 57% of industry associations) or between 1% and 5% (estimated by 43% of industry associations). The Member States are expected to incur administrative burden in terms of enforcement and compliance checks. The actual economic impacts of a ban on destruction will depend on the product scope of SPI measures that introduce a ban on the destruction of unsold products in practice and applicable exemptions. This shall be considered in the context of the impact assessment of these SPI measures.

In terms of internal market impacts, sub-options 6a would be neutral, while sub-option 6b would have a positive impact in terms of level playing field.

¹⁶⁵ See annex 10 for a more detailed breakdown of the scores

Environmental impacts

Sub-option 6a is expected to have positive environmental impacts, however the exact magnitude of such positive environmental improvements attributable directly to the policy sub-option and for all product groups within the scope of SPI may vary, as explained with several examples cited in the literature. The environmental potential of circular business models is found to be broadly positive (see **Annex 10: Impacts of the policy options**) as value retention activities extend product lifetimes, hence reducing material and energy requirements (and related impacts) from production of replacement products, whereas product-as-a-service and sharing models increase the optimisation and intensity of product use.

Sub-option 6b, being cumulative to 6a, is expected to have the same environmental impacts, plus some additional positive effect due to the ban on the destruction of unsold products and the transparency obligation. For instance, it is expected to reduce GHG emissions, by reducing resource consumption, limiting production as well as the end-of-life treatment. While no fully conclusive estimations on the total amount of unsold products being destroyed in the EU are available, the impact assessment accompanying the recent ban introduced in France estimated that the measure could avoid the destruction of 10,000 to 20,000 tonnes of textile a year (see **Annex 10: Impacts of the policy options**).

Social impacts

Sub-options 6a is expected to have largely positive social impacts. Value retention circular business models (CBMs) prevent waste, and are far more job intensive than waste management, with analysis of evidence from 16 countries suggesting more than 400 jobs generated through re-use and repair activities per 10,000 tonnes of waste, compared to 2 jobs in landfill and incineration activities and 115 in recycling¹⁶⁶. Repair and servicing activities enable low-income families to continue to benefit from the functionality of products without the need to purchase replacements, whilst reuse activities provide access to pre-owned products at prices based on their residual value. Servitisation CBMs increase the affordability of more durable high-quality products as an alternative to low-cost, but less durable and less efficient products. Many circular economy enterprises are also engaging the socially excluded or vulnerable. This is true particularly in collection, sorting, repair, resale and upcycling operations, for example in textiles and food. Providing support for training in circular business models can open varied employment opportunities in the market, particularly as some sectors lack skills and staff (please see Annex 10 for more details and examples).

Sub-option 6b, being cumulative to 6a, is expected to have the same largely positive social impacts. They can be larger if companies increase their donations or sales at reduced prices as a result of the the ban on the destruction of unsold consumer products. Such donations and price reductions could have a positive social effect, making products more accessible for a segment of the population.

Stakeholder views

Based on Public Consultation results and discussions at a dedicated workshop, it appears that stakeholders would in general be relatively supportive of measures such as those foreseen under **sub-option 6a** to promote circular business models. **Member State** representatives also indicated that the idea of additional EU-level guidance on how to foster circular business models would be useful for them, as would the establishment of an information service (EU hub) on the subject.

There also appears to be solid level of support from some categories of stakeholders for the ban on destruction of unsold consumer products foreseen under **sub-option 6b**: Member State representatives, for example, saw merit in this measure. Most respondents to the second SME survey indicated that it would either have a positive overall impact on some SME business models, or have

¹⁶⁶ Gaia (2021)

neutral or no overall affect. Approximately one fifth nevertheless suggested such a measure could entail some additional burden for SMEs, while 6% indicated that destruction may be the only viable option for some SMEs in order to deal with these goods. Respondents to the first SME survey, however, indicated that incinerating or landfilling (i.e. destruction) were among the least likely options to be pursued by SMEs for dealing with unsold products.

Overall comparison

Table 6 Comparison of options under PO6¹⁶⁷

| Overall comparison | Sub-option 6a | Sub-option 6b |
|--|----------------------|----------------------|
| Effectiveness in delivering specific objectives | + | ++ |
| Efficiency | + | + |
| Coherence | + | ++ |
| Overall economic impacts (including benefits) | + | - |
| Administrative costs for Commission and MSs | +/- | - |
| Compliance costs for businesses | +/- | -- |
| Costs / Savings for consumers | + | + |
| Overall environmental impacts | + | ++ |
| Overall Social Impacts | + | ++ |

6.7. ANALYSIS OF POLICY OPTION 7

Economic impacts

Sub-option 7a is expected to decrease the administrative cost of preparing regulations for the European Commission. Member State market surveillance might be somewhat easier if third-party conformity assessment is used to a larger extent. This conformity assessment would however lead to additional cost for economic operators. This option should lead to more and better regulations and ultimately more economic benefits for consumers (estimated at a minimum of around EUR 3 billion annually, increasing depending on the number and kind of products additionally regulated)¹⁶⁸.

Sub-option 7b will increase administrative costs for the European Commission and the Member States, even if some efficiency gains might be achieved from better coordination of market surveillance at European level. This will however be largely compensated by the economic benefits stemming from reduced non-compliance in the internal market and from imported products, which will also benefit compliant businesses which will have to face less distortion from non-compliant products, while benefiting from increased support. For energy related products, the Ecodesign Impact Accounting Status Report of 2019 estimates the economic benefit for consumers from avoiding non-compliance to be in the order of EUR 12 billion in 2020¹⁶⁹. Achieving 50% of these benefits from sub-option 7b would lead to additional savings compared to 7a of around EUR 6 billion annually (EUR 9 billion in total compared to baseline)¹⁷⁰.

Depending on the administrative setup used, **sub-option 7c** might lead to a significant increase in administrative costs for the European Commission related to setting up the necessary capacities for the wide range of products in scope. Businesses and consumers will benefit from a decreased market penetration of non-compliant products. As with sub-option 7b, the economic benefits from reduced non-compliance would be significant and probably higher with more involvement at a European level

¹⁶⁷ See annex 10 for a more detailed breakdown of the scores

¹⁶⁸ Estimation based on the 2015 Ecodesign and Energy labelling Impact Assessment.

¹⁶⁹ Ecodesign Impact Accounting Status Report 2020

¹⁷⁰ Estimation based on the 2015 Ecodesign and Energy labelling Impact Assessment.

(at an assumed level of reduction of non-compliance of 70%, benefits would amount to around EUR 2.5 billion in addition to 7b (EUR 11.5 billion in total compared to baseline).

As regards impacts on the internal market, the increasing stringency of the sub-options regarding market surveillance is expected to lead to increasing levels of compliance, thereby levelling the playing field in the internal market.

Environmental impacts

Better regulation from streamlining the Ecodesign process (**sub-option 7a**), will lead to regulations that are adopted earlier and are better suited to the current market situation, for example in terms of available technology. For energy related products, the current delays in the ecodesign process, which is on average 24 months, theoretically neglects 2.6% of regulation-driven energy demand reductions. Addressing these savings would allow a reduction of up to 1.3% of GHG emissions compared to EU totals.

By lowering non-compliance, **sub-option 7b and 7c** will have a direct positive impact on the environment. For energy related products, reducing non-compliance by 50% would lead to an overall decrease in GHG emissions of up to 1.6%, as well as other environmental benefits, such as a reduction of particulate matter emissions by 0.8% and of primary energy consumption by 1.7%. Assuming a reduction of non-compliance by 70% would bring a 1.8% reduction in GHG emissions, 0.9% for particulate matter emissions and 1.8% for primary energy consumption. It should be noted that these impacts are cumulative to the ones highlighted under sub-option 7a. Overall, the reduction of non-compliance could reduce GHG emissions by around 22 Mt CO₂e in 2030, 8% of the GHG emission reduction from energy savings in that year.

Social impacts

As better regulation and market surveillance are a consequence of **sub-options 7a to 7c**, the market share of compliant enterprises could increase, as well as employment. For sub-options 7b and 7c, if it is assumed that companies complying with product regulations are also more likely to comply with labour laws, the overall social impact could be positive, promoting a level playing field.

Stakeholders' views

Stakeholders are generally supportive of the improvement of the ecodesign process, the reduction of delays and better market surveillance¹⁷¹.

Overall comparison

Table 7 Comparison of options under PO7¹⁷²

| Overall comparison | Sub-option 7a | Sub-option 7b | Sub-option 7c |
|--|----------------------|----------------------|----------------------|
| Effectiveness in delivering specific objectives | + | ++ | + |
| Efficiency | + | ++ | ++ |
| Coherence | ++ | ++ | ++ |
| Overall economic impacts (including benefits) | + | ++ | ++ |
| Administrative costs for Commission and MSs | - | -- | --- |
| Compliance costs for businesses | +/- | +/- | +/- |

¹⁷¹ See for example statement from ECOS https://ecostandard.org/news_events/industry-associations-challenge-ecodesign-package-measures-before-eu-court/, Applia <https://www.applia-europe.eu/topics/121-joint-industry-letter-on-ecodesign>.

¹⁷² See annex 10 for a more detailed breakdown of the scores

| | | | |
|--------------------------------------|---|----|----|
| Costs / Savings for consumers | + | ++ | ++ |
| Overall environmental impacts | + | ++ | ++ |
| Overall Social Impacts | + | + | + |

7. PREFERRED OPTION

7.1. THE PREFERRED COMBINATION OF POLICY OPTIONS

Based on the assessment and comparison of sub-options and their impacts, the overall preferred option package is a combination of sub-options **2b, 3b, 4b, 5b, and 6b**. For Option 7, **sub-option 7b** is considered preferred for the purposes of the impact assessment. This package of measures is the best performing (including in terms of effectiveness and proportionality), with all of the different sub-options being coherent together: the different sub-options are all either independent of each other, or strengthen each other. Please see Annex 12 for more details, including two case studies describing how SPI would work in practice.

The sub-option retained for **Option 2** – extension of the scope of Ecodesign Directive – is **sub-option 2b**: Extension to all physical products. This will allow for the potential coverage of any products placed on the EU market, on the basis of clear criteria and a working plan, thus enabling prioritization of the most important categories and making the framework flexible and futureproof at the same time. In terms of the prioritisation, the products identified under sub-option 2a are likely to offer most value-added and so be tackled first. For construction products, the CEAP and SPI goals shall be mainly realised by means of the Construction Products Regulation (CPR). The CPR shall be able to mirror all obligations and requirements able to be set through the SPI, but for construction products – the same is explained in the Impact Assessment (IA) on the CPR revision.

For **Option 3** – extension of sustainability requirements for products – **sub-option 3b is preferred**. This means that the product scope extension will be complemented by **new and strengthened provisions on minimum requirements for sustainability and circularity** to be adopted through product-specific SPI measures. In addition, it will include the possibility to adopt **horizontal requirements, applicable to a group of products sharing common characteristics**, for example setting reparability and upgradeability requirements for all electronic devices or minimum information requirements for all products containing substances of concern. Sub-option 3b will also allow the European Commission to spearhead work on **social requirements**, a dimension of sustainability so far not directly tackled through Ecodesign. This new dimension and the use of environmental profiles will build on the reinforcement of the provisions related to third party conformity assessment under Option 7 and build on synergies with the improved consumer and business information provisions under Option 4. To ensure proportionality, each individual requirement will need to be justified for any product group before being applied.

For **Option 4** – sustainability information for consumers and B2B – **sub-option 4b is preferred**. The extension of the scope of Ecodesign to products that are not energy-using products will make the **provision of information related to the environmental impacts and circularity of products increasingly relevant**, so businesses can demonstrate that they meet relevant sustainability requirements and select sustainable inputs in their production processes, and so consumers can make sustainable choices more easily. This sub-option would also allow for information requirements to be set in the form of classes of environmental performance and will create links with existing databases, like EPREL or the SCIP Database on substances of concern in products. The revised horizontal framework legislation will introduce a **European Digital Product Passport**, and likely lay down some key objectives and principles governing this. As set out in previous sections, the operational details and IT infrastructure design will be developed through secondary legislation (and associated impact assessments), in close collaboration with stakeholders and also building on the results of a

number pilot projects currently funded under the Digital Europe and Horizon Europe programmes. These projects will represent a “proof of concept”, applied to at least three product groups (batteries, ICT and a third group to be proposed by the participating consortia). The content of each EU DPP will be decided when developing product-specific SPI measures, with the objective of only requiring the most relevant information, additional to what is already requested through existing legislations. The quantity and typology of information could be minimal at the beginning and increase progressively with time, depending on product groups and the experience gathered when deploying the EU DPP concept. The EU DPP will be used for sustainability aspects of products where relevant and, when relevant and technically feasible, also as a tracking & tracing tool to bring transparency along the value chains and facilitate the role of enforcement authorities. Annex 18 presents some possibilities currently available in terms of “design options” of the EU DPP. This is not meant to prejudice the future decision, but only to provide some examples to allow better understanding of the concept.

For **Option 5** – Reward more sustainable products through incentives – **sub-option 5b is preferred**. This means that Member States, whenever they aim at boosting the demand for sustainable products through incentives, they will be required (as is the case for Energy Labelling) to link their product incentives to classes of performance (developed under Option 4). Public authorities will also be required to align their procurement with specific Green Public Procurement criteria or targets, to be set out in measures adopted under SPI, thereby leveraging the weight of public spending to support more systematically a sustainable and circular economy. They will also be invited to expand their existing Extended Producers Responsibility (EPR) schemes to products covered by the framework and to ensure that fees are modulated as a function of the environmental performance of products, with rules in this respect also to be set out in product-specific measures adopted under SPI.

For **Option 6, sub-option 6b is preferred**, which includes measures under sub-option 6a to support circular business models as well as the introduction of a transparency obligation and bans on the destruction of unsold consumer products through SPI measures.

For **Option 7** – Strengthened application of the Ecodesign framework – **sub-option 7b** is considered preferred for the purposes of the impact assessment. The extended scope of the Ecodesign framework with even higher sustainability ambitions can only be successful if resources of both the European Commission and Member States are strengthened to a level commensurate with the ambitions. The European Commission (directly or through an executive agency, see section 7.10 *European Commission Administrative setup* below), can play a stronger role to support the design and enforcement of Ecodesign for sustainable product measures.

7.2. IMPACTS OF THE PREFERRED POLICY PACKAGE

The different sub-options chosen all combine well: none of the preferred sub-options needs to be changed as a result of another one. In more detail, building on the extension of scope (2b):

- The addition of sustainability requirements (sub-option 3b) will increase costs for producers, but this should be more than offset by the environmental benefits and financial savings for citizens. The impact assessments preceding adoption of detailed product rules will need to establish what cost increases are reasonable and proportionate from a consumer perspective, also taking into account the expected time horizon for expected savings (e.g. from increased durability etc.) to take effect. Additional administrative burden can be expected, for example for provision of information for market surveillance, though the possible introduction of a EU DPP (4b) is expected to help reduce this burden
- The wider scope of products and sustainability requirements means there is further benefit to the enhanced information requirements and the European Digital Product Passport (sub-option 4b). For example, minimum requirements to reduce environmental footprints (under 3b) combines well with provision of information on this footprint through an Ecological profile or EU DPP (4b): the sub-options chosen are mutually reinforcing.

- Similarly, the enhanced incentive measures in 5b will allow for more efficient and effective delivery of the objectives for the product groups in scope, and the wider sustainability requirements.
- Sub-option 6 will assist with delivery of the environmental benefits, and support the effectiveness of the other measures. For instance by supporting the uptake of circular business models, for instance in the second-hand market, the actual effects of requirements on reparability and durability (sub-option 3b) could be enhanced by keeping products in use longer.
- Sub-option 7b is similarly consistent with the other sub-options. The extended scope of the Ecodesign framework can deliver benefits commensurate to resources dedicated to its implementation.

Box 3: The SPI business case

Concerning impacts on businesses and SMEs, in general SPI is expected to generate some additional costs, which would be likely to be absorbed over time, and to bring several benefits from a business perspective, especially for SMEs, including:

- **Reduced material use and expenditure.** EU manufacturing firms spend on average 40% on materials¹⁷³. The reduction of material use that close loops (Option 3) and circular business models (Option 6) are expected to increase their profitability. This is confirmed by the targeted SME survey where 43% of the respondents (for sustainability requirements) and 53% (for requirements on minimum recycled content) indicated reduced material use as one of the factors that will offset the costs linked to those requirements being introduced by SPI.
- **Better functioning of the Internal Market and level playing field.** Harmonised sustainability performance and information requirements at EU level would replace several existing national requirements or prevent planned ones; this would result in easier compliance and in reduction of compliance costs for firms that are selling across the EU that would not have to face different and/or diverging requirements for their products. Manufacturers would benefit from an improvement of the level playing field through classes of environmental performance and harmonised requirements.
- **New business opportunities.** It is expected that in all manufacturing sectors there would be an expansion of business opportunities from production towards maintenance. Growth in the sector of repair services, refurbishment, and remanufacturing and thus jobs in these sectors to be expected as well. This would specifically favour SMEs as they are strongly represented in those sectors. Economic operators would benefit from the information made available by SPI measures¹⁷⁴ to increase efficiency (and hence lower costs and higher quality) of value retention activities.
- **Reputational benefits.** Less material dependency and sustainable circular business models, would increase manufacturers' reputation and their market share. For SMEs, responses from the targeted survey suggest that costs linked to sustainability requirements are likely to be offset over time also due to factors such as increased customer loyalty and increased reputational benefits. In addition, a better image of the manufacturing sector as contributing to the resolution of major environmental challenges would also attract young, qualified talent having a positive impact on innovation and would create opportunities for attracting significant long-term investments.

Thanks to this preferred approach, the Ecodesign scope will be extended to cover 65% of total GHG emission from products consumption in the EU, 64% of particulate matter emissions and 70% of resource depletion. Looking at GHG emissions only, assuming an improvement of 15% of

¹⁷³ 2020 Circular Economy Action Plan

¹⁷⁴ See for instance the "Business Case" section in Annex 18 dedicated to the EU DPP.

environmental impacts over the entire scope from SPI measures, would lead to globally reducing GHG emissions by around 471 Mt CO₂e, the equivalent of the annual emissions of Italy and Belgium.

The impact assessments of the SPI measures for the various product groups will examine the best combination of measures for that particular product group. The impact assessments of the implementing measures will also analyse in a proportionate way to what extent third countries are affected by the EU measures. Deeper knowledge of these impacts will allow the EU to better assist partner countries in reaching higher sustainability standards.

7.3. RELATIONSHIP BETWEEN LEGAL ACT AND SUBSEQUENT SPI MEASURES

Considering the chosen combination of sub-options, and without prejudice to the Commission's decision on the legal proposal and to the legislators' decision on the final legislative text, the future SPI legislation should be implemented in a similar way as the current Ecodesign directive, with

- a legal act defining the framework for the application of sustainability requirements to products in the scope of the legislation, allowing their placing on the EU internal market,
- SPI measures, adopted by the Commission on the basis of the objectives and criteria defined in the legal act, and adopted in accordance with the procedure set out in the legal act, for specific products or groups of products sharing common characteristics.

The actual impact of SPI should therefore materialise when SPI measures enter into force, after dedicated impact assessments, consultations and adoption procedures. The preparation and implementation of SPI measures typically include the following actions:

- the prioritisation of product groups to be covered by SPI measures, so as to maximise the impact of the legislation and address policy priorities; this prioritisation will take the form of a (multi-annual) work programme to organise the Commission's work and inform stakeholders for their own anticipation;
- the assessment of product groups in specific studies, gathering all the information and data needed on the technical and market characteristics, environmental and social impacts over their life cycle, technologies and improvement potential, costs and benefits to be expected from regulation, opinions of stakeholders, so as to define potential sustainability requirements and impact assess different options implementing sets of requirements; The assessment of products will also investigate the existence of **potential policy trade-offs** (for example, if a potential SPI restriction on the presence of chemicals in a given product would limit the possibility of extending that product's lifetime, or of reducing its other negative environmental impacts). Should such trade-offs be identified, these should be presented transparently, and the most appropriate solution pointed out, while providing clear information on the pros and cons of alternatives. The assessment phase – in particular given that it will include targeted consultation with relevant stakeholders – will be key for identifying optimum ways forward in these cases. During that phase, the several “design options” for that product and their impacts will be evaluated. This analysis and evaluation will yield the most beneficial option, including trade-offs within the environmental field and between fields (such as social and environmental), and will be reflected in the Impact Assessment reports of the product specific rules. The final decision on requirements and the right balance between objectives is to be taken at the level of the Commission based on the conclusions of the full assessment including stakeholder consultations;

It should be noted that, given the need to ensure consistency of approach and avoid unduly delays to SPI rules for the products already regulated, or soon to be regulated¹⁷⁵, under the existing Ecodesign Directive, the methodology to be adopted under SPI will enable certain distinctions to be made, in particular between *energy-related products for which energy consumption in the use*

¹⁷⁵ E.g. in the 2019 Ecodesign and Energy Labelling Working Plan, and 2022-2024 Ecodesign and Energy Labelling Working Plan

stage is dominant, and other products. Lifecycle assessment is likely to be the predominant methodological approach underpinning the assessment and regulation. For energy-related products for which energy consumption in the use stage is dominant, a dedicated life cycle assessment, in accordance with the MEERP methodology (and its ongoing revision¹⁷⁶) currently used under the Ecodesign Directive, should be used ensuring a focus on energy without neglecting other product aspects or SPI objectives (for example reparability, durability or reuse). The different assessment methods will be jointly evolving to address all the SPI objectives considering the nature of the product groups in question as new rules are rolled out. Due to the variety of products in the scope of the proposed legislation and their different nature, not all requirements can be envisaged for every product group¹⁷⁷. **Nevertheless, the clear objective will be to maintain a similarly high level of environmental ambition across all product groups regulated.** This will be achieved, amongst other factors, by placing clear emphasis on whole lifecycle analysis and fostering circularity for all products. The ongoing revision of the MEERP methodology will help further integrate such approaches for relevant energy-related products, and the proposed overall approach, presented in detail in **Annex 16**, seeks to ensure this.

- the implementation will follow the provisions of the legal act, in terms of obligations for relevant economic actors, verification and enforcement by Market Surveillance Authorities and Customs authorities, use of standardisation or self-regulation tools where appropriate; these provisions may be further detailed or complemented by provisions in the SPI measures as provided in the legal act;
- implementation of the legislation, as a whole and through each SPI measure, is monitored and evaluated so as to report on the results and review the legislation.

Annex 16 outlines the methodological considerations for enabling these actions, for instance the set of criteria to decide the order of priority for the development of SPI measures for products.

The measures identified in the chosen sub-options will materialise as follows:

- The product scope, as defined in sub-option 2b, should lead to the definition of the scope in the legal act and, at the same time, the assessment of impacts per product category undertaken in this IA should feed into the prioritisation exercise and work programme;
- Sustainability requirements, as defined in sub-option 3b, should be detailed as possible requirements in the legal act, and selected or not as actual requirements in SPI measures after the detailed assessment and consultation; sub-option 3b includes the possibility of SPI measures covering a large number of products having common characteristics;
- Information requirements, as defined in sub-option 4b, should follow a similar route as sustainability requirements of sub-option 3b. For the European Digital Product Passport, certain key principles and infrastructure rules should be defined in the legal act (e.g. the principle that all data should be written in standard, open, interoperable format) while the content specific to product groups (e.g. where exactly the data carrier should be located) should also be defined in product-related SPI measures;
- Measures on incentives, as defined in sub-option 5b, should be integrated into the legal act where such provisions are necessary for their implementation, and into SPI measures where incentives are linked to specific requirements such as performance classes. Policy measures such as guidance to stakeholders do not require a specific legal provision;
- Measures on the promotion of value retention and value maximisation, as defined in sub-option 6b, should follow a similar route as the measures on incentives; in particular, the ban

¹⁷⁶ <https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/521/home>

¹⁷⁷ For example, a limit on the energy efficiency during use is appropriate for a boiler, it is probably not for a mattress

on the destruction of unsold consumer products should be introduced through SPI measures, while the guidelines and hub supporting circular business models will not need a specific legal provision in order to be implemented (but they could be called for in the SPI basic act);

- Measures to improve the efficiency of EU implementation and strengthen market surveillance, as defined in sub-option 7b, should be integrated into the legal act -where necessary- and implemented using empowerments granted in the legal act. Measures on market surveillance should also be reflected in the relevant provisions of SPI measures. Additionally, some measures foreseen in Option 7 will not need to be integrated in the SPI legal act.

7.4. FEASIBILITY AND PROPORTIONATE IMPLEMENTATION

Whilst the changes made through Option 7 and the improved administrative set-up including capacity will improve implementation, it will still be a challenge to respond to the expanded scope of the Ecodesign Directive. The longer list of product groups and environmental impacts to be tackled will require prioritisation: the SPI will use clear, transparent and effective methodological criteria for the selection of the product groups for which the SPI measures will be developed, based on those already foreseen in Article 15 of the current Ecodesign Directive and set out in Annex 16 to this IA (e.g. environmental, energy and social impacts and related potential for cost-effective reduction of such impacts). The selection will follow a fully transparent process, involving stakeholders, culminating in working plans outlining the priorities to give predictability to economic actors.

Importantly, the existing Ecodesign Directive approach of implementing measures being based on impact assessments carried out in line with the European Commission's Better Regulation Guidelines will continue. As such, there will be an analysis of the economic, social and environmental impacts of different options for each set of product requirements. This will allow for proportionality to be maintained in future actions: for example, the analysis will examine the use of different design measures, the EU digital product passport product-specific requirements, minimum requirements or defining performance scales etc. This means that the assessment and identification of improvement options will be done on a product by product basis or for a group of products sharing common characteristics, underpinned by a sound analysis, and that this will largely determine the ultimate impacts for producers and citizens.

The various consultation activities carried out in the context of this impact assessment have provided useful indications of the expected impact of future SPI requirements on **SMEs**, as well as the type of support most likely to help alleviate any potentially negative impact on these businesses (see Annex 2 and 19). Taking these findings into account, each impact assessment for an SPI measure will examine whether the impacts for SMEs are proportionate, and the possibility of accompanying the SPI measure with mitigating measures. As a result, impacts are expected to remain proportionate for SMEs, with any impacts offset over time by benefits.

This analysis is supported in particular by the findings of the second targeted SME survey¹⁷⁸ which, though pointing to possible negative impacts for SMEs notably linked to implementation of some of the product and information measures outlined under preferred sub-options 3b and 4b respectively, suggested that certain benefits could also accrue, both from these measures as well as those under other sub-options, such as 5b. This survey also suggested that appropriate support, such as assistance with environmental and carbon footprint calculation/life cycle assessment methods¹⁷⁹, dedicated SME provisions in the legal text (e.g. longer transitional periods or exhaustion of stock provisions), as well as simplified procedures for SMEs (e.g. for reporting), could be effective in offsetting negative effects and assisting SMEs, allowing the 'Think small first' principle to be applied. These aspects will be

¹⁷⁸ See Annex 2 for more details

¹⁷⁹ The Commission is considering possible measures to facilitate the preparation of PEF studies by SMEs, including free IT calculation tools to reduce the costs for carbon footprint calculation.

further analysed in the preparation of SPI measures and where appropriate, relevant mitigating measures foreseen. See Annex 2, 12 and 19 for more detail.

7.5. REGULATORY BURDEN AND SIMPLIFICATION

In terms of the overall **regulatory burden**, the financial costs and benefits of the overall package will depend on the SPI measures that follow. The experience from the Ecodesign Directive until now though is relatively positive, with win-win measures being identified. Overall, there are higher costs for business from applying the requirements and these translate into upfront costs for citizens that are more than offset over time. The cumulative costs for business (and citizens) are unlikely to be significant, being spread over a large market, and with the issue of cumulative costs revisited for the different product groups.

The preferred option includes **simplification measures**, in the context of policy option 7. This will allow for example for streamlining of the procedures for the development and adoption of Ecodesign implementing regulations (changes in sequencing; ensuring information is collected efficiently; etc). Policy option 7 ensures that the structures put in place allow for efficient implementation, market surveillance and enforcement.

This preferred option makes maximum use of the potential of **digitalisation** to ensure efficient application. In particular, the use of a digital product passport will allow for efficient delivery of its objectives by ensuring that information failures are corrected by passing the right information downstream in a way that can be understood and accessed. Digital measures are also explored to facilitate efficient implementation and enforcement with policy option 7, for example, including making relevant product information digitally available to market surveillance authorities (MSAs) and possibly Customs authorities.

Table 8 European Commission's regulatory fitness and performance programme (REFIT) Cost savings

| <i>REFIT Cost Savings – Preferred Option(s)</i> | | |
|---|---------------|---|
| <i>Description</i> | <i>Amount</i> | <i>Comments</i> |
| Streamlining of the procedures for the development and adoption of Ecodesign implementing regulations | | Savings will depend on the number of products covered |
| Collecting data from manufacturers and retailers regarding regulated products sales and usage | | Savings will depend on the number of products covered |

The approach of implementing measures being based on impact assessments carried out in line with the European Commission's Better Regulation Guidelines means that there will be a systematic analysis of administrative costs generated for businesses, citizens and administrations. Administrative costs for businesses and citizens will be considered as part of the Commission's 'one in, one out' programme along with the possibility of their offsetting. Clearly, administrative costs will vary across sectors and businesses, but will be minimised and allowed only if proportionate (for example if necessary to generate significant benefits). Examples of possible administrative costs will include calculation of environmental footprints and provision of information by business through a Digital Product Passport, and labelling. Consideration will also be given to the reduction of administrative costs when one EU rule replaces diverging rules across the 27 Member States, which can lead to net benefits as the internal market is strengthened.

The Fit for Future Platform's opinion on Ecodesign¹⁸⁰ recognised the need to improve sustainability of products, and the necessity to introduce new obligations whilst keeping the burden on business to the minimum. The Platform made nine suggestions to ensure value added and proportionality: on scope; need to concentrate on key aspects of the environmental performance; that information requirements should be clear, comprehensible and comparable for consumers; need to consider implementability of the legislation and the roles of all the different actors; access to information and standardisation as a tool to reduce burden; planned obsolescence; transition periods; support for SMEs. These suggestions fed into the impact assessment process and were reflected where appropriate in the preferred policy option.

7.6. OVERVIEW OF COSTS AND BENEFITS

The overall impacts of the preferred policy option are assessed in Annexes 10 and 12. They include, **firstly**, the setting up of the overall framework, for which the main costs will be associated with setting up the European Digital Product Passport and strengthening of enforcement.

Strengthening of enforcement will take place through market surveillance and customs controls. It is assumed to require 210 FTEs of staff in the EU 27, with an administrative cost of around EUR 10.5 million per annum. In the Commission, there will be an additional 8 FTEs associated with market surveillance, customs controls and support to EU testing capacity.

With regards to the European Digital Product Passport, it is important to understand that the current proposal is a radically new approach and does not have precedents that would provide a good proxy for cost estimates. The costs for the Commission to set up the European Digital Product Passport are estimated at around EUR 8 million as one-off investment and at least EUR 1 million as annual maintenance cost. However, this is a preliminary estimate based on the information collected and the extrapolation of the costs for other decentralised systems currently under development. The costs for business will depend on the SPI measures and the lessons from first experiences (which will act as a

¹⁸⁰ https://ec.europa.eu/info/sites/default/files/final_opinion_2021_sbgr2_10_ecodesign.pdf

form of piloting). Additional costs will be incurred to support enabling measures needed for SMEs to adapt to new standards to be able to interact with the EU DPP. The European Digital Product Passport will though help saving money in terms of administrative burden for companies and of enforcement for public authorities, and improve the efficiency of information flows.

Under Option 7c, consumer savings through shorter lead times and through reduction of non-compliance could be EUR 11.5 billion per annum and would reduce GHG emissions by around 22 Mt CO₂e in 2030.

Secondly, the administrative process for preparing SPI measures (not the implementation) for an additional 30 product groups (or horizontal issues) will trigger additional costs of around EUR 25 million per annum. These costs will be largely for manufacturers and Member States, and are a doubling from current levels. The timing of the costs will depend on the timing for the delivery of the 30 additional SPI measures they relate to.

Most significantly, **thirdly**, the impacts that result from those SPI measures for the Member States, EU businesses, EU consumers and the environment as well as impacts outside the EU on businesses, citizens and the environment. It is challenging to identify the overall costs and benefits before the analysis to underpin them is undertaken, but tentatively the additional costs of another 30 SPI measures (to deliver sub-option 2b) could be in a range of 30 to 60 billion Euros per annum when fully incurred. The Ecodesign Directive experience has been that costs of production are more than offset by financial savings for consumers. Under SPI, there is also clear potential for benefits from life extension and improvements in the production process. Furthermore, production cost increases could also be offset by savings along the value chain for other businesses.

There is likely to be net economic benefits overall at a global level; and any SPI measure with net economic costs will only go ahead if justified on the basis of its environmental impacts. Overall, a reduction of 15% of environmental impacts over the increased (i.e. just the additional) scope due to implementation of SPI measures would lead to reduced GHG emissions of around 117 Mt CO₂e, with a monetary value of around EUR 12 billion per annum. Adding on the improvements from option 7, these figures increase to around 139 Mt CO₂e, with a monetary value of around EUR 14 billion per annum.

It is not possible to place an illustrative monetary value on the wider environmental impacts, but assuming a 15% efficiency it would reduce 6% of EU particulate matter and 3% of EU resource depletion¹⁸¹. If the new initiative delivered environmental improvement over the whole scope, by improving sustainability for energy related products, these figures could of course be higher.

7.7. INTERNATIONAL COMPETITIVENESS

An assessment of the economic impact demonstrates that the proposed initiative would not affect production costs in a significant manner in the long term. As seen in the problem definition, more sustainable products in general imply more production costs compared to less sustainable alternatives. It is expected that the companies selling products in the EU will have to face a cost increase in the short term due to the compliance to the revised Ecodesign legislation. However, the SPI would generate a level playing field in the EU. Furthermore, in the medium/long term the requirements introduced by the SPI measures could become an international benchmark for the product groups concerned, as it is currently happening for products falling under the current Ecodesign Directive^{182, 183}.

¹⁸¹ SPI Impact Assessment Study, based on EXIOBASE

¹⁸² “[...] Many developing countries could model their regulations on existing ones (those of the European Union, for instance) [...]”, IEA (2020), Appliances and Equipment, IEA, Paris <https://www.iea.org/reports/appliances-and-equipment>

¹⁸³ “At least 45 countries outside the European Union have adopted minimum energy efficiency requirements for products, some of them in fact implementing ecodesign regulations in the context of association agreements or EU membership negotiations.”, SWD(2015) 139 final

Requirements would not be more trade restrictive than necessary, and apply in a non-discriminatory manner to EU and non-EU companies, thus ensuring a level playing field for sustainable products in the EU market. Likewise, European producers would not be disadvantaged in their ability to function inside or outside Europe. In line with current EU international cooperation, the EU will provide continuous support to developing and least developed countries for the green transition. In particular, efforts will be made to mitigate possible adverse effects (via technology transfer and capacity building). Moreover, the SPI measures of the revised legislation will be developed in a transparent manner and third countries will be fully informed in the process. The preparation of the implementing measures will analyse in a proportionate way the potential impact of the measures in producing countries, including the possible effects on trade and investment flows.

The SPI measures would strike a proper balance between predictability and legal certainty and allowing for technological progress. This is important for products in fast changing markets, where there is a need to facilitate adaptability and regulatory responsiveness in line with technological and market developments.

7.8. IMPACT ON CONSUMER BEHAVIOUR

Consumer behaviour refers to the study of how consumers¹⁸⁴ make decisions about what they need, want, and desire and how they buy, use, and dispose of goods. The Sustainable Product Initiative will change consumer behaviour. It will respond to the problem (see 2.2) that it is still too difficult for economic operators and citizens to make sustainable choices given that relevant information and affordable options to do so are lacking. It will also nudge consumers towards more environmentally friendly purchases, by correcting market failures (see 2.5.1).

The legislation will restrict consumer choices through Option 3 by introducing minimum requirements for specific products on for instance the carbon and environmental footprints or minimum requirements on the aspects that affect the lifetime of a product such as reparability. These minimum requirements respond to cognitive biases such as myopic behaviour and bounded rationality (see 2.5.3) by excluding the least sustainable products from the market (therefore simplifying consumers' choices).

The legislation will aim to change how consumers actively behave. Price and quality are the most important decision factors for consumers when **buying products**. The majority of EU consumers consider themselves "occasional" consumers of environmentally-friendly products (56%) and more than a quarter pay attention to the environmental impact of all or most goods and services (23%). 67% EU citizens buy products that are better for the environment even if they cost more¹⁸⁵. 43% of EU consumers declared that they would be willing to pay for environmental information¹⁸⁶, and 56% of consumers would use the information to buy more environmentally friendly products¹⁸⁷. Providing more information on the environmental characteristics of products that is perceived to be robust may help to turn this willingness into actual sustainable choices. Moreover, this information would complement future measures¹⁸⁸ developed to incentivise sustainable consumer's behaviour when using products, by encouraging for example repairs or the purchase of second hand goods. Option 4 will respond and facilitate greener consumer behaviour by clearer and more accessible information, including for some products their classes of performance and possibly related labels.

The Digital Product Passport (*see annex 18*) would further enable and shift green consumer behaviour by changing the information available. In addition, digital product information, for example QR

¹⁸⁴ Consumer here is used as general term and includes economic actors along the value chain (including B2B).

¹⁸⁵ *Consumer conditions survey*, European Commission, 2021.

¹⁸⁶ Data extrapolated from the consumer survey for the impact assessment on Consumer Empowerment [*add reference when published*].

¹⁸⁷ Impact assessment on Consumer Empowerment [*add reference when published*].

¹⁸⁸ New Legislative Initiative on the Right to Repair as announced in the Commission Working Programme for 2022 (https://eur-lex.europa.eu/resource.html?uri=cellar%3A9fb5131e-30e9-11ec-bd8e-01aa75ed71a1.0001.02/DOC_2&format=PDF)

codes, would allow private providers to develop apps and services that greatly improve the ability of consumers to assess products and compare them.

Option 5 will be a further ‘nudge’ policy, working for example through reputational and economic incentives to shift consumer behaviour and respond to the underlying market failures.

The greening of consumer behaviour could be limited if there is an issue with the affordability of the more sustainable products on the market. The mechanisms affecting prices will be complex, and work in different directions. The economic measures proposed under sub-option 5b (mandatory GPP and Member States incentives assigned to best performing products) are meant to sustain the demand for more sustainable products. Moreover, increased reliability, reparability, and durability will extend the potential lifetimes over which purchase costs can be spread, including for some by facilitating repair, resale and second lives. Increased sustainability will often come at an increase in up-front costs. The current Ecodesign Directive has removed the poorest performing energy related products and led to significant savings for customers over the lifetime of energy related products, but with some upfront costs (around a half to a third of their energy savings)¹⁸⁹. However, these upfront costs do not appear to have led to social impacts related to affordability, perhaps because the pay off period in terms of savings can be short for energy related products. However, affordability issues will differ between product groups and so the impact assessments accompanying implementation measures will examine this on a product-by-product basis. These issues will need to be looked at on a case by case basis in the impact assessments accompanying future measures, considering changes in upfront costs, quality, and lifetimes (taking into account the different impacts over the time horizon).

7.9. COHERENCE OF THE PREFERRED COMBINATION OF OPTIONS WITH OTHER INITIATIVES

Even if the success of SPI does not depend on the implementation of other related initiatives in preparation, the assessment of the preferred combination of policy options has confirmed the positive synergies that exist between them.

Indeed, in addition to playing a central role in achieving the objectives set in the European Green Deal, **SPI will contribute to ensuring overall coherence between these initiatives**: it will act as a key link between many of them and help to maximise their overall coverage. This will be achieved in number of ways:

- **It will fill key regulatory gaps**: SPI will be in a position to cover products whose sustainability aspects are currently unaddressed, or under-addressed, at EU level (e.g. textiles; furniture). This will remedy the existing ‘patchwork’ situation¹⁹⁰, which is resulting in certain products falling through the regulatory cracks¹⁹¹. In addition, with the wide scope preferred for SPI (sub-option 2b), it will be in a position to respond to novel products and future product trends, thereby avoiding the occurrence of problematic regulatory gaps in the future. This will also allow it to intervene with specific, complementary requirements, even for products whose sustainability dimensions are primarily regulated by other instruments. One example could be to define digital product passport requirements for products, in cases where the primary legislation that regulates them is not appropriate for doing so.
- **It will act as a bridge between horizontal and product-level rules** (see figure 3 below): SPI will be in a position to take targeted action, tailored to specific product/product value chain needs or problems. It will therefore be ideally suited to complement and concretely reinforce

¹⁸⁹ Under the current Ecodesign Directive there has been a EUR 60 billion (5% of the baseline) saving in 2020 on consumer expenditure (EUR 76 billion energy cost saving, EUR 7 billion consumables saved, EUR 23 billion extra acquisition costs). This is a direct savings per household of EUR 210 in user expenditure in 2020, expected to increase to EUR 350 per year per household in 2030 (See Annex 6)

¹⁹⁰ See SWD(2019) 92 final

¹⁹¹ Conversely, products already covered or proposed to be covered by a comprehensive set of sustainability requirements (e.g. batteries) are unlikely to be priorities under SPI

horizontal initiatives (such as the initiative on Empowering Consumers for the Green Transition; the Sustainable Corporate Governance initiative; the Packaging and Packaging Waste Directive¹⁹²), by acting as *lex-specialis* to their more general rules. In cases where product-specific sustainability problems are identified (e.g. related to the packaging of a *specific* product category, or the human rights risks of a *specific* product's value chain), or where more detailed rules on the provision of durability or reparability information to consumers for a *specific* product are possible, SPI will be able to elaborate on and further complement the general obligations set on these aspects in other instruments, at the level of the product itself.

- It will **synergise with and foster the objectives of other CEAP initiatives**: While the Green Claims Initiative will cover environmental claims made voluntarily on products and SPI's requirements will be mandatory, the two will nevertheless work in synergy to ensure reliable information on the sustainability and environmental performance of products is always provided to consumers and supply chain operators. SPI will also be the main instrument to develop the ecodesign measures that are central to achieving the EU Textile Strategy's objectives as well as the objectives of the Circular Electronics Initiative.

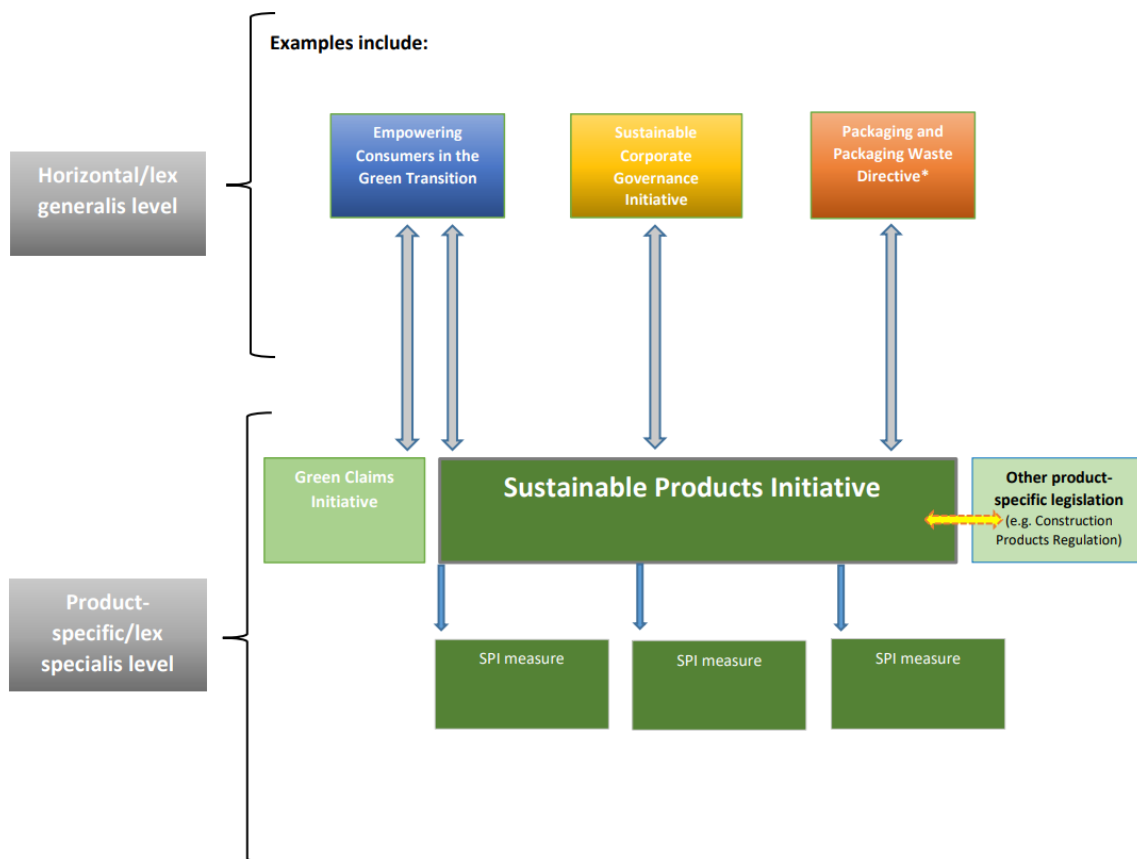


Figure 3 Illustration of horizontal and product level interaction with SPI as key bridge

* While the Packaging and Packaging Waste Directive will lay down both horizontal rules and rules for **packaging as a final product in itself**, SPI will take action on packaging associated with *specific* products.

¹⁹² It should be noted that while the Packaging and Packaging Waste Directive will be in a position to lay down rules for packaging as a final product in itself, SPI is intended to take action on packaging associated with *specific* products

Ensuring coherence

While the envisaged future interaction between SPI and other initiatives (including those mentioned above) has been set out in detail in Annex 14, it is clear that careful and continuous coordination will be needed, as well as legal and procedural clarity.

Such coordination has already begun internally within the Commission and will continue to be developed and expanded as the various initiatives come forward, with appropriate coordination structures to be set in place and formalised, for example through creation of a “sustainable product centre” (see also section 7.10 and 7.11 on future administrative set-up). Also, as the JRC will have a technical support role in SPI, the Green Claims Initiative, the EU Ecolabel¹⁹³, the IED revision and developments relating to Green Public Procurement and Environmental Footprint methods, this will be a source of coherence between these initiatives. Finally, preparation of the SPI measures – which will include targeted stakeholder consultation and dedicated impact assessments – will allow any remaining coherence issues to come to the fore and be addressed in good time and in advance of laying down product-specific rules. While concrete details of these future interactions are set out in Annex 14, some examples of the clearest synergies are set out below:

Table 9 Synergies between other initiatives and SPI preferred policy option

| Other initiatives forming or supporting the SPPF | Their synergies with SPI preferred policy option |
|---|--|
| Initiative on Empowering Consumers for the Green Transition | <ul style="list-style-type: none"> • Gradual, product-specific reinforcement of the initiative on Empowering Consumers for the Green Transition’s horizontal information requirements on durability and reparability (via SPI sub-options 3b and 4b) and reinforcement of its general aim of enhancing availability of product sustainability information (via SPI sub-option 4b’s additional information requirements, e.g. on substances of concern; recycled content etc.); synergies between the SPI’s DPP, which will require sustainability information to be available to consumers in digital format connected to the product, and the initiative on Empowering Consumers for the Green Transition, which will require certain information on durability and reparability to be provided to the consumer in a clear and comprehensible way before purchasing the product (via SPI sub-option 4b) • The initiative on Empowering Consumers for the Green Transition reinforces (enforcement of) possible SPI requirements on product’s durability, reparability and availability of software updates, for example by defining as an unfair commercial practice the marketing of products that do not allow repair in accordance with product legal requirements established under the future SPI. Confirmed cases of such unfair commercial practices could allow the harmed consumers to have access to proportionate and effective consumer remedies. |
| Green Claims Initiative | <ul style="list-style-type: none"> • While SPI will set mandatory information requirements and prescribe the method to calculate the relevant information only for the products for which there will be SPI measures, GCI will set requirements for voluntarily-made claims on all types of products. • Both contribute to the overall objective of providing reliable, comparable and verifiable information to stakeholders on the sustainability and environmental performance of products, SPI through mandatory product information requirements (via SPI sub-option 4b) and GCI through |

¹⁹³ Please see further details in Annex 14 and here: <https://ec.europa.eu/environment/ecolabel/>

| | |
|---|--|
| | <p>substantiation, verification and communication requirements on voluntary claims.</p> <ul style="list-style-type: none"> • Methodological synergies expected, with PEF method used by GCI to substantiate green claims on specific impacts, life cycle or environmental performance, and likely to be used to underpin relevant SPI requirements. The development of the methods based on which GCI would establish further requirements in future (for example on reparability) will be done in synergy with the development of SPI requirements. The aim is to ensure coherence of methodological approach, without overlap or contradiction of actual measures. |
| Sustainable Corporate Governance Initiative | <ul style="list-style-type: none"> • Gradual, product-specific reinforcement of SCGI's horizontal due diligence rules, where specific social or human rights risks linked to a particular product (or its value-chain) and not sufficiently addressed through SCGI are identified in SPI preparatory studies (via SPI sub-options 3b) • Where SCGI is not sufficient to address specific risks SPI product-specific due diligence obligations are able to ensure targeted due diligence efforts on the part of the companies placing on the market a product linked to specific social or human rights risks. • SPI product-specific due diligence obligations will be tailored to the relevant risk and product to increase effectiveness and will be set in line with SCG's main definitions and procedures to allow for integrated compliance where relevant |

Example regarding coffee machines: illustration of possible interaction between initiatives

Assuming there is an SPI measure on **coffee machines**, the interaction of that measure with the Green Claims Initiative (GCI) and the initiative on Empowering Consumers for the Green Transition (ECGT) could be described as follows (for an example related to the SCGI please refer to *Annex 14.1*):

1. In so far as related to the sustainability information on products:

An SPI measure could require that to be placed on the market, coffee machines must have a Digital Product Passport indicating, amongst other possible aspects, their (i) reparability score and (ii) carbon footprint¹⁹⁴.

Should the manufacturer of a coffee machine wish to voluntarily make claims on its environmental impacts in addition to these elements, the GCI would require them to observe certain requirements regarding substantiation and communication of the claim. E.g., if a coffee machine is advertised with a claim showcasing the reduced human toxicity impacts achieved during its production, such a claim needs to be underpinned by a PEF study quantifying a coffee machine's life-cycle environmental impacts and showing the relevance of human toxicity impacts.

The ECGT would lay down a general obligation on sellers to provide consumers, at the point of sale, with a coffee machine's reparability score, or where there is no such score established by EU law, other relevant repair information where available. The ECGT would also oblige the seller to provide the consumer with information on the existence (or absence) and length of a commercial guarantee of the coffee machine's durability if longer than two years.

2. In so far as related to the sustainability characteristics and performance of products:

An SPI measure (in addition to minimum requirements on e.g. energy efficiency and recycled content) could, for example:

¹⁹⁴ Using PEF as the baseline method to be used in compliance with Recommendation 179/2013 and its updates.

- exclude a specific technical solution found to be detrimental to the durability of coffee machines;
- require the availability of a list of spare parts;
- require that a coffee machine can be disassembled with a list of commonly available tools.

To reinforce this, the ECGT would define as an unfair commercial practice prohibited under Directive 2005/29/EC, amongst other things, the marketing of coffee machines without informing the consumer about the existence of a feature of the coffee machine introduced to limit its durability, or of the fact that the coffee machine does not allow repair in accordance with legal requirements. As a consequence, marketing coffee machines not complying with the listed SPI requirements can be confirmed as an unfair commercial practice, when the consumer is not informed thereof. Confirmed cases of such unfair commercial practices would allow the harmed consumers to have access to proportionate and effective consumer remedies.

7.10. EUROPEAN COMMISSION ADMINISTRATIVE SETUP

The preferred option, which enlarges the scope of the current Ecodesign framework, requires resources to prepare, adopt, implement, monitor and review product specific or horizontal product regulations. The key issue is to determine what level of resources is necessary for the level of ambition desired. The actual managerial arrangements is a matter for the Commission's internal decision-making.

Resource needs in the European Commission

Human and financial resources needed to prepare and follow-up on SPI rules depend on, in particular, the complexity of the product and requirements set and the exact definition of products subject to a measure¹⁹⁵. The planning exercise that takes place when looking at the multiannual Working Plan is a key step to define product groups that make sense from a functional and regulatory point of view.

Between 2022 and 2026, the Commission needs to review 33 Ecodesign Regulations and the adoption of 5 new Regulations is planned under the current Ecodesign Directive. A reasonable estimate based on experiences is that around 0.5 FTE policy officers, on average, to cover one product, including work on standardisation. With around 11,5 Full-Time Equivalents (FTE) currently allocated to all aspects of Ecodesign¹⁹⁶, delays are experienced in the management of existing energy related product groups, and no new product can currently be tackled. Additional resources needed to deliver this properly would be around 24 FTEs, plus costs for studies.

The number of additional non-energy related product groups that can be regulated – and the speed at which they can be regulated - is a direct function of the resources available to deliver the preferred option of the additional around 30 SPI measures. The table assumes around 0.9 FTE per non-energy related product and envisages preparatory work to allow for 4 new SPI measures in 2024, 6 in 2025 and then starting work on 4 new SPI measures every subsequent year. The following table gives an indication of how human resource needs could evolve. This leads to an estimated need of 16 FTEs in 2023 and increasing progressively up to 28,5 FTEs in 2027, in addition to the redeployment of 8,5 FTEs currently allocated to the preparation of SPI or other tasks in the 3 lead DGs. Overall, the human resources available in the Commission would then need to increase considerably, phasing in with the adoption through co-decision of the SPI expected by 2023: eventually up to 54 FTEs would be required in addition to existing resources to deliver this level of ambition.

¹⁹⁵ The MEErP methodology provides an introduction to the issue under its task 1 section. <https://ec.europa.eu/docsroom/documents/26525/attachments/1/translations/en/renditions/pdf>. See also infra, under Annex 6, Methodology.

¹⁹⁶ Some of these resources are allocated to EPREL, support to Member State market surveillance, international cooperation and court cases

Table 10: Additional Human Resource requirements over time, European Commission

| | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <i>SPI Eco-design legacy products</i> | 13 | 24 | 23 | 21 | 20 | 19 | 18 | 17 | 17 |
| <i>SPI new products</i> | 0 | 16 | 21.5 | 23.5 | 25.5 | 28.5 | 29 | 29 | 29 |
| <i>Digital Product Passport</i> | 0.5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| <i>Circular business model hub</i> | | | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| <i>Support to market surveillance</i> | 0.5 | 0.5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| <i>TAXUD customs control</i> | | 1.5 | 2 | 2 | 2 | 2 | 1.5 | 1.5 | 1.5 |
| TOTAL | 14 | 44 | 51 | 51 | 52 | 54 | 53 | 52 | 52 |

7.11. ADMINISTRATIVE SETUP OPTIONS

Within the European Commission, different administrative setups can be envisaged to implement the new legislative framework. A key element underpinning all options is an increase in staff resources commensurate with the objectives. As detailed above, in any case, **each additional product specific regulation, contributing to the objectives, requires human resources allocations, but provides a high return on investment.**

A **first option** would be to build upon the current situation, with competences spread among 3 DGs, and mobilising additional staff and financial resources in line with the increase of product groups and individual products and the activities which will need to be performed related to the adoption of SPI measures, their revision; preparation of guidelines; preparatory studies etc. While this option would enable to continue the current work, it would likely miss out on streamlining opportunities, knowledge sharing and synergies that could be brought from the other options.

A **second option** is to delegate some of the activities to an external agency. Under this option, the European Commission would delegate some of the work to an agency, including for example contract/studies management, some technical support to stakeholders, standardisation activities and DPP support. The ability to delegate a significant portion of the work to an agency should however not be overestimated as most of the work currently done by the European Commission under ecodesign is already related to core policy work that cannot be delegated. Only work that is currently subcontracted could be to a large extent delegated to an agency. On that basis, the estimated number of FTEs needed to implement the SPI does not warrant the overhead costs linked to the setting up of an agency. However, the mandate of an existing agency could be modified to add this function. Alternatively, an analysis of needs and potential efficiency gains in related policy areas could justify setting up such agency. This could be done in time for the mid-term review of the multiannual financial framework.

A **third option** would be to create a “sustainable product centre” within the European Commission. The difference would be that staff allocated to the sustainable product policy will function under a virtual “Sustainable Products Centre” inside the European Commission. While European Commission staff would remain under their DG of origin, they would also be part of a permanent centre/task force, with an overall coordination ensuring knowledge sharing and with responsibility for horizontal tasks. In that context, the delegation of the some of the workload to an agency could remain a possibility, mainly for the type of activities that are currently sub-contracted. This option could also build on and fully integrate the technical know-how of JRC which already contributes to ecodesign preparatory studies and horizontal/methodological work on circular economy strategies and carbon and environmental footprint.

8. HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED?

Monitoring will start right after the adoption of the SPI, focused on its **implementation**. A plan will be designed, allowing for a tracking of the implementation of actions and measures required against a specific timeframe. The objective is to have the SPI measures under the revised Ecodesign legislation adopted within two years from its entry into force – at least for a first set of product groups. Implementation reports by the European Commission should allow for an adequate monitoring of the SPI implementation.

Progress against impacts will likely be monitored on an annual basis at the level of a product group, starting two to three years after the entry into force of the SPI for the specific product group. Reporting by the Member States on the results of market surveillance, reputational and economic incentives, and green public procurement will provide the European Commission with data on enforcement actions and compliance rates. A comprehensive evaluation of the SPI, eight years after its entry into force, should build upon the product group-specific review studies and focus on the attainment of an enhanced environmental and social sustainability of non-food products in the EU market. The evaluation would also look into any potential need to extend the scope as regards the inclusion of services. See annex 13 for more detail.

The table below presents the **core indicators** that could be used to monitor the SPI progress in the attainment of the desired impacts and to evaluate whether the objectives of this initiative are being met. To ensure that the selected policy measures actually deliver the intended results and to inform possible future revisions, the monitoring and evaluation process includes indicators assessing the evolution of environmental and social impacts of product production and consumption, the use of secondary raw materials in product production and enhancement of circularity, the lifetime of non-food products, abiotic waste generation, and the socio-economic effects on industry sectors as well as consumers and users.

The indicators will build on existing data, possibly including Eurostat circular economy indicators¹⁹⁷, waste statistics, environmental accounting and business statistics. In most of the cases, these data will require further development on their scope and purpose to ensure that the indicators reflect the extended scope and requirements set on products and product groups in the SPI compared to current legislation. Additional coordination will be needed for this: at Commission level, such coordination is already ongoing, with the JRC fulfilling a technical support role, and further legal and procedural clarity will be provided via the main SPI legal text. Additional data will come from product-specific review studies.

Table 11: Core SPI indicators

| Desired impacts | Indicator | Source |
|---|---|---|
| Coverage | | |
| Increased number of products covered | Number of product groups covered by Ecodesign implementing measures | Ecodesign Impact Accounting, VHK for the EC |

¹⁹⁷ For instance the Monitoring Framework for the Circular Economy, <https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework>

| Desired impacts | Indicator | Source |
|---|---|---|
| Results in the environmental sphere | | |
| Lower environmental impact of industrial processes manufacturing basic metals, materials and chemicals | Pollutants and Greenhouse Gas (GHG) emissions by the manufacturing value chains feeding the EU Internal Market | Eurostat (ENV_AC_AINAH_R2) |
| Lower primary material use in manufacturing processes | Increase in circular material use rate | Eurostat (ESMS-IP) on circular material use rate |
| Better energy and resource efficiency in the use phase of non-food products | Energy efficiency of durable goods placed or put in service in the EU Internal market; Water efficiency of those durable goods using water, placed or put in service in the EU Internal market; resource productivity (material efficiency) | Ecodesign Impact Accounting, VHK for the EC |
| Longer lifetime of non-food products | Average life duration of the durable products as a consequence of (1) its intrinsic durability, (2) the maintenance, repair and upgrade operations it was subject to, and (3) the number of its successive users | To be gathered by product-specific review studies for each implementing measure |
| Higher levels of sustainably-sourced renewable content | Contribution of post-consumer recycled materials to raw materials demand of the EU Internal Market - for non-precious metals, Critical Raw Materials, and plastics. | Eurostat (cei_srm010) |
| | Circular material use rate - Share of material demand satisfied by secondary raw materials (% of total material use) | Eurostat (online data code: env_ac_cur) |
| Less abiotic waste generation in EU | Volume of abiotic waste generated in the EU by manufacturing sectors and households | Eurostat (ENV_WASGEN) |
| | Generation of waste excluding major mineral wastes per capita and per domestic material consumption (DMC) / Percentage | Eurostat (cei_pc033) |
| Results in the socio-economic sphere | | |
| Increase in investment expenditures for the design, | Value added and its components by activity, ISIC rev4 | OECD.Stat |

| Desired impacts | Indicator | Source |
|---|--|---|
| production & after-sales services of non-food products | | |
| Higher market share for more sustainable non-food products | Supply table at basic prices incl. transformation into purchasers' prices, filtered by industries categories of final uses and imports and categories of products and gross value added components. | Eurostat (NAIO_10_CP15) |
| | Green public procurement - the share of public procurement procedures above the EU thresholds (in number and value) that include environmental elements | Eurostat Circular Economy Indicators - under development |
| | Savings for consumers thanks to higher costs of products compensated by a higher use-value | To be gathered by product-specific review studies for each implementing measure |
| Increased economic value of the recycling and repair and reuse sectors | "Gross investment in tangible goods", "Number of persons employed" and "Value added at factor costs" in the recycling sector and repair and reuse sector. | Eurostat (cei_cie010) |
| | Number / evolution of enterprises involved in the repair of computers and personal and household goods" | Eurostat, Annual detailed enterprise statistics [SBS_NA_1A_SE_R2] |
| Improvement in working conditions across the value chains of non-food products | "Share of the working time performed along the value chains of the non-food products sold on the EU Internal Market where: - At least one worker is elected as their representative; - At least one collective bargaining agreement is applicable" | ILO Statistics on collective bargaining / ILO Annual review under the follow-up to the 1998 Declaration |
| Desired impacts | | |
| Increase in environmental sustainability of products consumed in the EU | Reduced environmental impact associated with consumption of sustainable products covered by (revised) Ecodesign Directive, measured by: - CO-emissions - Organic Gaseous Carbon (OGC)-emissions | Ecodesign Impact Accounting |

| Desired impacts | Indicator | Source |
|---|---|---|
| | <ul style="list-style-type: none"> - Particulate Matter (PM)-emissions - Primary material contents | |
| Increase in social sustainability of products consumed in the EU | Number of occupational fatal injuries and deaths in the Value Chains supplying the consumption of non-food products in the EU | ILO - Data on fatal injuries and deaths in the mining and the manufacturing sectors |



Brussels, 30.3.2022
SWD(2022) 82 final

PART 2/4

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

**Proposal for a Regulation of the European Parliament and of the Council
establishing a framework for setting ecodesign requirements for sustainable products
and repealing Directive 2009/125/EC**

{COM(2022) 142 final} - {SEC(2022) 165 final} - {SWD(2022) 81 final} -
{SWD(2022) 83 final}

Annex 1: Procedural information

LEAD DG, DECIDE PLANNING/CWP REFERENCES

The preparation of this file was co-led by three Directorates-General: DG Environment (ENV), DG Internal Market, Industry, Entrepreneurship and SMEs (GROW) and DG Energy (ENER). It was included as the following items in the DECIDE/Agenda Planning database: PLAN/2020/7714, Sustainable Products Initiative.

ORGANISATION AND TIMING

The initiative is a deliverable under the European Green Deal and was further set out in the **Circular Economy Action Plan**¹ (CEAP); see *Annex 5: Political Context* for details.

The **Inception Impact Assessment Roadmap** was published on 14 September 2020 with a feedback period until 16 November 2020².

The Inter Service Steering Group (ISSG) for the Impact Assessment was set up by the Secretariat-General (SG). It included the following DGs and services: AGRI (Agriculture), BUDG (Budget), CLIMA (Climate Action), CNECT (Communications Networks, Content and Technology), COMM (Communication), COMP (Competition), DEFIS (Defence Industry and Space), EAC (Education, Youth, Sport and Culture), ECFIN (Economic and Financial Affairs), EMPL (Employment, Social Affairs and Inclusion), ENER (Energy), ESTAT (Eurostat), FISMA (Financial Stability, Financial Services and Capital Markets Union), FPI (Foreign Policy Instruments), I.D.E.A. (Inspire, Debate, Engage and Accelerate Action), INTPA (International Partnerships), JRC (Joint Research Centre), JUST (Justice and Consumers), MARE (Maritime Affairs and Fisheries), MOVE (Mobility and Transport), OLAF (European Anti-Fraud Office), REGIO (Regional and Urban policy), RTD (Research and Innovation), SANTE (Health and Food Safety), SJ (Legal Service), TAXUD (Taxation and Customs Union) TRADE (Trade), NEAR (Neighbourhood and enlargement) as well as EEAS (European External Action Service). Meetings were organised between autumn 2020 and autumn 2021.

The ISSG discussed the Inception Impact Assessment and the main milestones in the process, in particular the consultation strategy and main stakeholder consultation activities, key deliverables from the support study, and the draft Impact Assessment report before the submission to the Regulatory Scrutiny Board.

CONSULTATION OF THE RSB

An informal upstream meeting with the Regulatory Scrutiny Board (RSB) took place on 30 April 2021. After final discussion with the Inter-Service Group (ISG), a draft of the IA was submitted to the RSB on 20 July 2021 and discussed at a meeting with the RSB on 15 September 2021.

Following the negative opinion of the RSB from 17 September 2021, changes were made to the IA in order to reflect the recommendations of the Board. Table below presents an overview of the RSB's comments and how these have been addressed.

¹ COM(2020) 98 final

² [Sustainable products initiative \(europa.eu\)](https://european-council.europa.eu/media/en/press-room/pages/press-room.aspx?pid=64674)

Table 12: How RSB comments of 17 September 2021 have been addressed.

| <i>Comments</i> | <i>Actions</i> |
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| RSB Opinion - Summary of findings | |
| <p>B1.a The report is not sufficiently clear on what will be addressed by the Sustainable Products Initiative, or by the subsequent implementing legislation and other related initiatives. It is not clear on how full coverage and coherence between all these initiatives will be ensured.</p> | <p>Interplay among related and existing initiatives (e.g. Green Claims, Consumer Empowerment, Corporate Sustainable Governance, Construction Products Regulation, Packaging, etc.) better explained in the Introduction (clearer and expanded section 1.3 on “Coherence with other Sustainable Product Initiative (SPI)-related initiatives”); in section 7.8 (new table) and in a revised Annex 14 (see section 14.1)</p> <p>A new paragraph 7.3 (“Relationship between legal act and subsequent SPI measures) has been added in the main report, explaining the interplay between the SPI basic act and SPI measures.</p> <p>The 2 case studies have been improved to better show how SPI will work in practice</p> |
| <p>B1.b There is also no clarity on the precise role, scope and delivery instrument of the digital product passport.</p> | <p>In response to the RSB comments, it has been decided to set out the objectives and principles in the SPI main legal act. The technical details of the EU digital product passport will follow through empowerment, and so the operational details will be provided in a dedicated Impact Assessment.</p> <p>A new Annex 18 has been added, clarifying the role and scope of the EU digital product passport. More details about governance, design principles, and deployment strategy have been added.</p> <p>More details about the design of the EU DPP has been added in Section 7.1, describing the preferred option.</p> |
| <p>B2.a The report does not sufficiently elaborate on the options and their relative merits.</p> | <p>Better elaboration of the each policy option and the relative merits, both in Annex 9 and Annex 10 and in the main report (section 5.2)</p> <p>Box 2 explains the architecture of the options in the main report</p> |
| <p>B2.b It does not sufficiently justify the preferred package of sub-options, in particular as regards product scope and</p> | <p>Improved assessment of the various sub-option, in particular of options 2 and 3. This is reflected in Annex 9, 10, 11 and Section 6.2 and 6.3 of the</p> |

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| sustainability requirements. | main report |
| B3.a The report does not sufficiently consider the costs and benefits | A new section 7.6 (Overview of cost and benefits) added in the main report and most extensively in a new dedicated section Annex 12 (Preferred Option). The revised Annex 10 includes more input from stakeholders, including on cost and benefits for each option. |
| B3.b It does not provide sufficient indication of the order of magnitude of expected impacts and whether they would be positive or negative | A new section 7.6 (Overview of cost and benefits) added in the main report and most extensively in a new dedicated section Annex 12 (Preferred Option). The revised Annex 10 includes more input from stakeholders, including on the magnitude of expected impacts. |
| B3.c The analysis of impacts on SMEs is insufficient | Summary of Annex 19 (SME test) added in section 7.4 of the main report (Feasibility and proportionate implementation). Additional elements in section 6 of main report. Additional section on SMEs added to Annex 12 Annex 19 (SME test) has been further developed, by extracting more elements from the first SME survey and by adding a new section dedicated to mitigation measures. In addition, a supplementary SME survey ('second targeted SME survey') has been carried out and the results have been included in the revised IA report (see Annex 2; section 7.4; Annex 19) |
| B3.d The expected compliance and administrative costs are not clearly presented | The revised Annex 10 includes a more elaborated analysis and additional input from stakeholders on expected compliance and administrative costs. |
| RSB Opinion - What to improve | |
| C1.a The report should better demonstrate the specific problems the Sustainable Products Initiative aims to tackle (including clear evidence and improved explanation of the link to the underlying internal market issues) | The main problem has been better articulated, including a clearer reference to internal market: <i>Consumption and production are not sustainable and not adequately addressed by existing EU products and internal market rules, leading to increasingly divergent national rules on the sustainability of products.</i> The general objective has been expanded, making a clearer link to the internal market issues: <i>to reduce the negative life-cycle environmental and social impacts of products</i> |

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| | <p><i>and improve the functioning of the internal market</i></p> <p>A new “Box 1: Problem Context” added in the main report, bringing some elements from Annex 7</p> <p>A new driver (Insufficient EU regulatory framework for sustainable production and consumption) added under the regulatory and administrative failure, both in the main report and more extensively in Annex 7, including a new table presenting diverging national initiatives.</p> <p>A new section (“Increasing market fragmentation”) added under “Consequences for Markets” in Annex 7, including a table presenting the views of stakeholders supporting EU action.</p> <p>A better elaboration of “Why should the EU act?” in Annex 8</p> |
| <p>C1.b It should better explain how the initiative is intended to interact and work together with related initiatives (such as on Green Claims, Consumer Empowerment, Corporate Sustainable Governance) and how potential overlaps, gaps and inconsistencies (for instance as regards social due diligence requirements or sustainability concepts) will be avoided. This should be made clear upfront but also detailed when it comes to the problem description and later in the scope, objectives and measures considered</p> | <p>Interplay among related and existing initiatives (e.g. Green Claims, Consumer Empowerment, Corporate Sustainable Governance, Packaging, etc.) better explained in the Introduction (clearer and expanded section 1.3 on “Coherence with other Sustainable Product Initiative (SPI)-related initiatives”); in section 7.8 (new table) and in a revised Annex 14 including new section on the Sustainable Corporate Governance Initiative.</p> |
| <p>C2.a The report needs to be clearer about what would be determined in the Sustainable Products Initiative and what in the subsequent implementing legislation and the reasoning behind it</p> | <p>A new section (7.3) on ‘Relationship between legal act and subsequent SPI measures’, has been added in the main report explaining the interplay between the SPI basic act and SPI measures.</p> |
| <p>C2.b As regards the digital product passport, it should clarify its precise role (including for other initiatives) and scope as well as envisaged delivery form (e.g. horizontal instrument, exclusive specification in implementing measures)</p> | <p>A new Annex 18 has been added. It provides more information on the design principles and the implementation strategy</p> |
| <p>C3.a With a view to bringing out more clearly the available policy choices, the report should better present the sub-options</p> | <p>The presentation of all sub-options has been improved, both in section 5.2 of the main report and more extensively in Annex 9</p> |

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| <p>C3.b It should explain how the Ecodesign process, which would be the basis for the initiative, could be sufficiently improved and accelerated to ensure the objectives are successfully achieved</p> | <p>Description of the necessary administrative set-up has been expanded in the main report, showing how the Ecodesign process could be further improved, and how processing of the necessary workload could be accelerated.</p> <p>Description of measure 7.a.1 in Annex 9 has been improved.</p> |
| <p>C3.c It should justify why the environmental footprint methodology is not better integrated, also in view of its envisaged role under the Green Claims initiative</p> | <p>Annex 16 has been revised and expanded. In line with the Green Claims initiative, PEF will be incorporated in the new SPI methodology when a LCA is needed, but it is not the only assessment method to be used. Other alternatives will be allowed in particular for energy-related products when the use phase is the dominant one in the life cycle. For aspects not covered by PEF, other assessment methods will be used and further elaborated if needed.</p> <p>Measure 3a.5 (Minimum requirements to reduce carbon and environmental footprints set at process and/or life cycle environmental impact(s) level) has been further elaborated to better explain the role of PEF in assessing products' environmental impacts along their life cycle</p> |
| <p>C3.d The report should also improve its description and analysis of the proposed due diligence requirements and how full coherence with the Sustainable Corporate Governance initiative will be ensured</p> | <p>Measure 3b.3 has been revised and elaborated to better explain complementarity with respect to existing legislation and instruments on due diligence.</p> <p>A revised Annex 14 including a new section on the Sustainable Corporate Governance Initiative provides further detail</p> |
| <p>C3.e It should explain how possibly conflicting objectives would be tackled in a coherent way in the implementing legislation (e.g. between early replacement of products to reduce energy use and minimal use of natural resources; between technical or economic feasibility and how are these defined)</p> | <p>This is addressed in a new section (7.3) on '<i>Relationship between legal act and subsequent SPI measures</i>', as well as in Annex 16.</p> |
| <p>C4.a The report should strengthen its analysis of costs and benefits and of impacts (notably on SMEs)</p> | <p>The revised Annex 10 includes a more elaborated analysis and additional input from stakeholders on costs and benefits, based on an additional targeted consultation with business</p> |

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| | <p>associations on costs.</p> <p>A supplementary SME survey has been carried out (including focus on cost and benefits) and the results have been included in the revised IA report (see section 6 and 7.4; Annex 2; Annex 19)</p> <p>New elements also added in Annex 12</p> |
| C4.b While acknowledging the uncertainties and difficulties in estimating some of these aspects, the report should at least give an indication of whether the expected overall economic impact would be positive or not | <p>New dedicated paragraph in the section 7.5 (<i>overview of costs and benefits</i>) of the main report</p> <p>New dedicated section in Annex 12 (preferred option)</p> |
| C4.c It should also provide a more developed analysis of the expected compliance and administrative costs | <p>A supplementary SME survey has been carried out and the results have been included in the revised IA report (see section 6 and 7.4; Annex 2; Annex 19)</p> |
| C4.d The main report should include an assessment of the impacts on SMEs, including possible mitigating measures and how it has applied the ‘think small first’ principle | <p>Analysis of SME impact has been strengthened in the main report (as well as in the Annexes). Please see various sections on stakeholder feedback in section 2; stakeholder views in section 6; and section 7.4)</p> |
| C4.e It should explain better the role of consumer choices, whether this initiative intends to change consumer behaviour and how it plans to do so | <p>Sub-problem 2 in the main report (Too difficult for economic operators and citizens to make sustainable choices in relation to products) have been expanded with a section dedicated to consumer choices</p> <p>A new section 7.8 (Impact on consumers choices) has been added analysing SPI impact on consumer behaviour, and better linking to the behavioural biases. In addition, information about the Right to Repair Initiative, which will further promote repair and sustainable use of products, has been added to the report.</p> |
| C5 The report should better explain the performance scoring and the justification of the preferred package of sub-options. It should, for instance, better demonstrate, on the basis of the collected evidence, why an all-encompassing product scope is preferable to a narrower product scope likely to deliver similar benefits in a more efficient manner. It should better assess the overall proportionality of the preferred option package | <p>Concerning prioritization and hence proportionality, new explanations have been added in section 6.2 and 6.3 of the main report. Annex 9 provides additional elements as well.</p> <p>The new Annex 11 provides a better explanation the performance scoring and the justification of the preferred package of sub-options. Also Annex 12 has been improved to address this question.</p> |
| C6.a The views of different categories of stakeholders should be presented more systematically throughout the main report | <p>Done both in the main report (e.g. in the problem definition) and in Annex 10, with new boxes presenting stakeholders’ views on each option,</p> |

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| | including diverging views. Added a new section in Annex 2 (Stakeholder consultation) on main stakeholders' views divided by categories. |
| C6.b The report should explain how it took relevant minority views into account | Done in Annex 10, with new boxes presenting stakeholders' views on each option, including diverging views. |
| | |

Following the resubmission of the revised impact assessment, the RSB issued a second opinion on 21 January 2022. This opinion was positive with reservations. The impact assessment has been revised to respond to the second opinion as follows:

Table 13: How RSB comments of 21 January 2022 have been addressed.

| <i>Comments</i> | <i>Actions</i> |
|--|---|
| RSB Opinion - Summary of findings | |
| B.1 <i>The report does not sufficiently justify the choice of options regarding the scope and the sustainability requirements of the Sustainable Products Initiative (SPI).</i> | Please see the detailed points discussed below under C.1, C.2 and C.3 |
| B.2 <i>The report does not sufficiently define (1) the methodology and standards that will be used to prioritise and assess products, including for social and due diligence aspects, (2) its definition of 'sustainability', and (3) trade-offs between competing objectives. (4) It is not clear how policy coherence across the products in scope will be ensured.</i> | (1) Please see the detailed points discussed below under C.4.1 and C.4.2 |
| | (2) Please see the detailed points discussed below under C.4.3 |
| | (3) Please see the detailed points discussed below under C.4.4 |
| | (4) Please see the detailed points discussed below under C.4.5 |
| B.3 <i>The report is not sufficiently explicit about the horizontal principles and objectives of the digital product passport and which of its elements need to be determined on a product-by-product basis.</i> | Please see the detailed points discussed below under C.6 |

| RSB Opinion - What to improve | |
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| <p>C.1 The more complete problem description now focusses on the risk of diverging regulation in Member States, resulting from a lack of EU regulation. The report should clarify why this regulatory failure should be addressed by introducing product-specific rules, instead of general rules applicable to all products and services.</p> | <p><i>A paragraph has been added in box 2 in section 5, explaining why product-specific rules are clearly superior to general horizontal rules and what the risks and drawbacks are of the latter.</i></p> |
| <p>C.2 (1) The report should be clearer on the choice between, and arguments supporting, applying the Sustainable Products Initiative to a limited number of priority products and to all products.</p> <p>(2) The report should better explain how it takes into account the higher administrative burden for businesses and administrations of the full-scope option.</p> | <p>(1) <i>Text has been added in section 6.2 on the assessment of option 2 noting that Ecodesign addressed all energy-related products, not specific ones, that it is important to be able to take action where appropriate without changing legislation and that actual improvement potential is only knowable when the analysis is done. All three argue against artificially constraining the scope.</i></p> <p><i>Some of this text also added to description of option 2b in section 5.2, as well as to analysis of sub-options in sections 6.2 and 6.3.</i></p> <p>(2) <i>Paragraph added at the end of Section 7.5 and in Annex 3</i></p> |
| <p>C.3 (1) The report should better justify the choice of a wider set of sustainability requirements, that include due diligence.</p> <p>(2) It should demonstrate how it has taken into account the higher compliance costs for businesses, especially SMEs.</p> | <p>(1) <i>Some additional clarification added to description of option 3a (in section 5.2) – to better clarify link with the IA’s working concept of ‘sustainability’</i></p> <p>(2) <i>Additions have been made to the description of sub-option 3b (in section 5.2) as well as to the analysis of the economic impact of this sub-option (in section 6.3), including to better reflect impact on SMEs how these will be taken into account</i></p> |
| <p>C.4 (1) The report should be more explicit on the methodology, standards and requirements that will be used to prioritise and assess products, including social</p> | <p>(1) <i>Brief new section on possible methodological approach to assessment of social aspects added to Annex 16</i></p> |

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| <p>sustainability and due diligence aspects.</p> <p>(2) Where this is not yet possible, it should clarify why, explain the remaining steps to be followed, the decisions still to be taken, as well as summarise the nature of the document setting out the SPI methodology and its evidence base.</p> <p>(3) It should state clearly the definition of ‘sustainability’ to be used, or justify why different definitions can be used for different products.</p> <p>(4) The report should also explain the analytical framework that will be used to resolve policy trade-offs between competing objectives (such as between energy vs resource efficiency or jobs vs social standards).</p> <p>(5) It should explain how policy coherence across the products in scope will be ensured.</p> <p>(6) In this context, it should also justify why a less-ambitious methodology will be used for energy-related products.</p> | <p>(2) <i>Please see additions and clarifications in sections 7.3 of the main report as well as Annex 16</i></p> |
| | <p>(3) <i>Please see adjustments to problem definition (section 2)</i></p> |
| | <p>(4) <i>This issue of potential policy trade-offs has been further addressed in section 7.3, where an attempt is made to elaborate the approach that will be taken to resolving them in the future.</i></p> |
| | <p>(5) <i>Please see additions and clarifications in section 7.3 and Annex 16</i></p> |
| | <p>(6) <i>See additional clarification in section 7.3 of the main text</i></p> |
| <p>C.5 (1) Considering the difficulty of estimating the costs and benefits of what will likely be a costly measure, the methodology should be more explicit as to what would be ‘acceptable’ cost increases.</p> <p>(2) It should clarify whether there is an expected time horizon for durability savings to offset increased product prices resulting from the sustainability requirements.</p> | <p>(1) <i>Some clarifications added to analysis of relevant sub-options (in section 6.3), as well as to impact of preferred policy package (in section 7.2)</i></p> |
| | <p>(2) <i>The main text clarifies in section 6.3 and 7.2 that affordability aspects, including the time horizon over which possibly increased purchase prices are offset by savings, will be analysed in the impact assessments for future measures.</i></p> |

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| <p>C.6 (1) While the report now provides more information on the digital product passport, it is not clear what will be determined already in the main legal act. The report should be more explicit on the specific objectives, principles and infrastructure of the digital product passport that should feature in the horizontal SPI legal instrument.</p> <p>(2) It should explain and justify what will be regulated in a possible ‘horizontal SPI measure’.</p> <p>(3) The report should also clarify how the envisaged regulatory digital product passport design will make it easier to create such passports for products outside the SPI scope.</p> <p>(4) It should better explain how the envisaged implementation arrangements of the digital product passport will keep administrative costs for business and administrations to the minimum necessary.</p> | <p><i>(1) Some additional elements added to description of this sub-option (in section 5.2); and to description of relationship between legal act and subsequent SPI measures (section 7.3).</i></p> <p><i>(2) Reference to a possible ‘horizontal SPI measure’ on the digital product passport has now been removed</i></p> <p><i>(3) This reference has been deleted (as it did not reflect the final preferred set of sub-options, which includes extension of SPI to a wide range of goods, with only a few limited exceptions).</i></p> <p><i>(4) Some additional explanations added in section 6.4</i></p> |
| <p>C.7 The scoring of options should be better explained and justified in the main report.</p> | <p><i>Footnotes with references to annex 10 for more detail added for each table in section 6, when presenting the scores of the respective option.</i></p> <p><i>Scores on administrative burdens for option 2b adjusted to be in line with option 2a in table 2 and in annex 10.</i></p> |
| <p>C.8 As the implementation of the SPI will require substantial additional human resources, the report should explain how their availability will be ensured.</p> | <p><i>Additional details on the human resource implications of the preferred option are provided in section 7.10 and in further details in the financial fiche annexed to the SPI legal proposal. The availability of these resources is a political and management decision to be taken by the College.</i></p> |

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| <p>C.9 (1) The report should specify when an evaluation will be carried out.</p> | <p><i>(1) The main text now clarifies in section 8 that an evaluation of the framework would be carried out eight years after entry into force. Annex 13 has been revised to provide further explanation.</i></p> |
| <p>(2) It should clarify whether a review as regards the possible inclusion of services under the scope of the SPI is envisaged.</p> | <p><i>(2) Section 8 of the main text and annex 13 have been revised to clarify that the evaluation after eight years would also investigate whether there is a need to increase the scope to include services.</i></p> |

EVIDENCE, SOURCES AND QUALITY

To support the analysis of the different options, the European Commission awarded a **support contract** to external experts - Economisti Associati srl (Consortium Lead) Trinomics B.V. (Lead for the Specific Assignment).

These experts worked in close cooperation with the European Commission throughout the different phases of the study.

Annex 2: Stakeholder consultation

The Impact Assessment accompanying the Sustainable Products Initiative was subject to a thorough consultation process that included a variety of different consultation activities aiming to gather the views of all relevant stakeholders and to ensure that the views from different organisations and stakeholder types were presented and considered.

These activities included a period during which it was possible to provide feedback on an Inception Impact Assessment³ (193 responses) and an Open Public Consultation⁴ (626 responses). In addition, a targeted consultation exercise was carried out to further enhance the evidence base through the collection of more specialized feedback from targeted stakeholder groups. This was done via the organisation of seven different stakeholder workshops, targeted stakeholder surveys tailored for different stakeholder groups (138 responses), a survey for small and medium-sized enterprises (339 responses) as well as 49 interviews.

This synopsis report presents a summary of these consultation activities and their results.

FEEDBACK ON THE INCEPTION IMPACT ASSESSMENT

The Inception Impact Assessment on SPI was published on 14 September 2020 and the period to provide feedback closed on 16 November 2020.⁵ A total of 193 responses were submitted through the online Better Regulation Portal, most of which were provided by business associations (46%), followed by business organisations/companies (27%), NGOs (9%), EU and non-EU citizens (6%), public authorities (5%), academic and research institutions (2%), trade unions and “others” such as social organisations (2%), consumer organisations (1%) and environmental organisations (0,5%).

Scope of the SPI framework

Most stakeholders advocated for a comprehensive scope for the SPI framework that includes all products and their whole lifecycle (LCA approach). Across stakeholder groups, some also asked for the (initial) focus to be on the priority sectors outlined in the Circular Economy Action Plan (CEAP), namely on the high-consumption and -impact products.

Sustainability requirements

A majority of all stakeholders stressed the importance of a Life Cycle Assessment (LCA) approach that should be reflected in the assortment of sustainability requirements (both horizontal and vertical/sector-specific).

Coherence with other initiatives

It has been stressed across all stakeholder groups that unaligned overlapping or doubling of policies should be avoided; policies should be harmonised and aligned.

Labelling & digital product passports

Mandatory labelling was perceived as an important means to bring more transparency into the supply chain, providing a benchmark (e.g. an EU-wide recycling label, the Ecolabel, the Product

³ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en

⁴ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative/public-consultation_en

⁵ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en

Environmental Footprint (PEF)). Digital product passports are generally supported by clear majorities across all stakeholder groups.

Eco-design Directive

There was consensus across all stakeholder groups about the need to extend the current Eco-design Directive from energy-related products to all products or initially to CEAP priority sectors.

Sustainable procurement

A large majority of all stakeholders is in favour of Green Public Procurement as it will allow for more products that have the best environmental and sustainability performance to be purchased by the public sector. Here, mandatory minimum criteria and targets were demanded.

Extended Producer Responsibility (EPR) including eco-modulation fees

Some stakeholders indicated that EPR should be applied to all products on the market where appropriate, while also allowing take-back systems developed by individual businesses to co-exist with mandatory regulated systems. Most organisations argue that EPR schemes should include eco-modulation fees.

Enforcement and market surveillance

Enforcement and market surveillance activities (e.g. inspections or audits) are seen as necessary to accompany the implementation of the SPI. Stakeholders recommend exploring both fast screening methods to detect products most likely not to comply, as well as more comprehensive or even dissuasive measures.

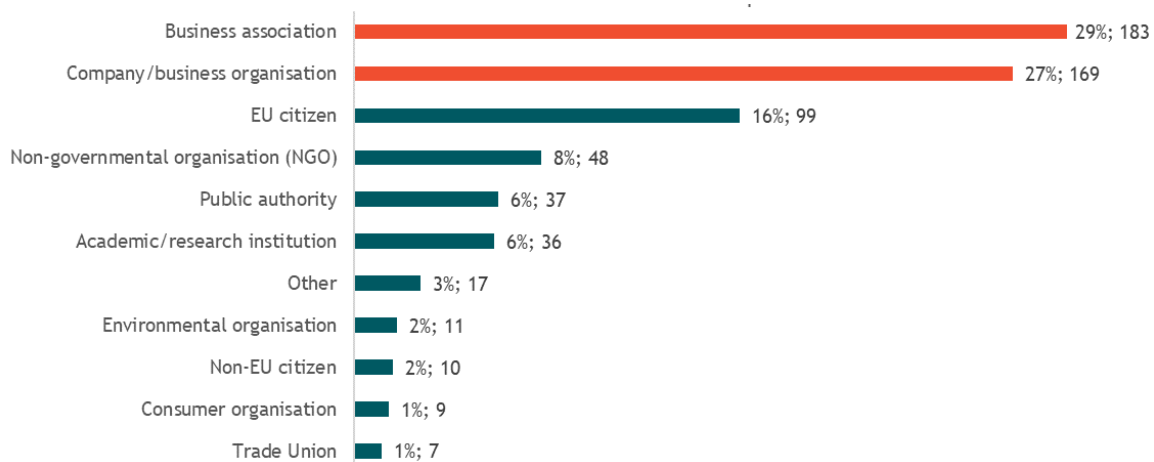
OPEN PUBLIC CONSULTATION

In the context of the preparation of the Impact Assessment, an open public consultation was accessible to the public for 12 weeks from 17 March 2021 to 9 June 2021. During this time, the survey received 626 responses. The majority (56%) of respondents to the survey represented, directly or indirectly, business interests⁶, with a predominance of energy- and resource-intensive sectors. EU citizens represented 16% of respondents, while organised civil society (NGOs, environmental organisations, consumer organisations, trade unions) represented 12% of respondents. Public authorities (mainly at national level) and academic institutions represented 6% each of the respondents. Respondents from outside the EU (mainly European Environment Agency, Turkey, the United Kingdom and the United States⁷) represented 16.5% of answers.

⁶ Composed of ‘business associations’ and ‘company/business organisation’. For the purposes of this summary, only ‘business associations’ are compared to other stakeholder groups.

⁷ A limited number of responses were also received from: Brazil, China, Georgia, Japan, Russia, Serbia and UAE.

Figure 1 Type and number of respondents to the OPC



General Summary of OPC results

Challenges to making products sustainable

Majorities across all stakeholder groups agreed that products placed on the EU market could, for a variety of reasons, be more sustainable. When asked about the reasons why products are not more sustainable, there was a general consensus among respondents that this relates to product design or to the cost of sustainable solutions. The responses on the effects of lacking guarantees on second-hand products or of (technical or “planned”) obsolescence were less consensual, with opinions differing among different stakeholder groups. Whereas 50% of NGOs disagreed or strongly disagreed that the quality of second-hand goods cannot be guaranteed or is difficult to assess, only 22% of business associations thought the same. Similarly, 81% of Non-Governmental Organisations (NGO) representatives strongly agreed or agreed that some products are designed to break down after a certain period of time (planned obsolescence). In contrast, only 24% of business associations had the same opinion on this.

Majorities across all stakeholder groups agreed that policy-related reasons that explain why products sold in the EU are not more sustainable include the lack of incentives rewarding sustainable products as well as diverging national rules and the absence of harmonisation on the EU Internal Market. Whether voluntary approaches, such as labelling, suffice as incentives was marked by differences in opinion. On this question, only 27% of stakeholders representing business associations either strongly agreed or agreed, whereas it was the case for 83% of NGOs and 91% of environmental organisations⁸.

Answers to the open question mentioned other reasons why products in the EU Internal Market are not more sustainable: competition from external producers subject to lower social or environmental requirements, “greenwashing”⁹, missing technologies and infrastructure for recycling, advertising and other practices promoting over-consumption.

⁸ Further analysis of this and certain other OPC questions is set out in annex 10.

⁹ To be addressed in the Green Claims Initiative.

Measures to make sustainable products the norm

There was less agreement among respondents regarding the measures to be taken to improve the sustainability of products. Binding rules via sustainability requirements that would also focus on actions to be taken by producers to improve durability, re-useability, upgradability and reparability were generally better accepted with 32% of business associations agreeing or strongly agreeing, compared to 88% of NGOs and 91% of environmental organisations. This was much less the case for the requirement to set up a repair network where only 18% of business associations provided support or strong support (4 and 5 out of 5) compared to 36% of NGOs and also 36% for environmental organisations. On the question on whether to require producers/importers to publish information on how they have prioritised materials that are safe and sustainable-by-design and have substituted chemicals of concern with safer ones whenever possible only 18% of business association respondents provided support or strong support, whereas this was the case for 38% of NGOs and 36% of environmental organisations.

The requirement to provide information on the product, e.g. in the form of a Digital Product Passport, was generally very well accepted across all stakeholder groups, specifically regarding how the user should interact with the product, as well as on the information to be contained in the Digital Product Passport such as the product's environmental performance, information on compliance with ecolabels, standards and legislation, on safe use and recyclability, and on the economic actors at the origin of the information. With regards to including information on the social conditions along the value chain, 31% of business associations agreed or strongly agreed, compared to 88% of NGOs and 100% of environmental organisations. On the other hand, requirements to disclose information that could be of use to other operators for repair, remanufacture or recycling, or to market surveillance authorities, was not so well supported by business associations where only 18% agreed or strongly agreed in comparison to 71% of NGOs and 73% of environmental organisations. Similarly, on the need to include information on the quantities of materials and substances contained in the product, 25% of business associations agreed or strongly agreed, compared to 87% of NGOs and 100% of environmental organisations. The greatest challenge identified to the implementation of the Digital Product Passport related to the complexity of the value chains.

The category of products for which most respondents considered that a potential ban on the destruction of unsold consumer products should not apply, were those that pose a health or safety risk.

All four Circular Business Models proposed (reverse logistics, product-service systems, collaborative and sharing economy, on-demand production) were similarly supported across all stakeholder groups. The main obstacle to the uptake of these business models was seen in legislation, with concerns on profitability and investment level coming next. The most approved measures supporting the Circular Business Models (CBM) “product-service system”, “collaborative & sharing economy” and “reverse logistics” related to Green Public Procurement and obligations to producers for take-back and repair/maintenance. The CBM “on-demand production” was considered to be best supported by tools to measure the benefits and financial viability of CBMs. Other CBMs were suggested in the open answers, such as producer ownership (incl. lend/lease, rental), models encouraging consumers to return products (buy-back, deposit) and those supporting secondary use of products (trusted marketplaces, re-manufacturing). The empowerment of consumers in repair / do-it-yourself activities with open resources, as well as that of producers in cooperatives, were suggested.

Across all stakeholder groups, the most supported incentives for circularity relate to access to finance for the production and consumption of sustainable products, hence underlining that these constitute an investment. Transparency and standards were also well supported, as well as mandatory Green Public Procurement criteria. Voluntary schemes such as the Ecolabel were the least supported measure.

Other incentives were suggested by the open answers, such as a tax on virgin / fossil materials or a tax on environmental impact.

Compliance with and enforcement of sustainability requirements for products

The best supported measure put forward across all stakeholder groups to enhance compliance was for the European Commission to provide guidance and support to Member States. Also very well supported was the proposal to set verification targets for products most likely to be non-compliant. On the other hand, distributing the enforcement per sector among Member States was generally rejected. The answers to the open question highlighted in addition that Market Surveillance should focus in priority on imports and online sales.

OPC results: views by main stakeholder category

1. Business association and company views

Problem definition: general support from industry for the main lines of the problems analysed in this impact assessment: a high number of respondents agreed that products are not currently designed to be easily repaired or upgraded (51% agree or strongly agree; 13% disagree or strongly disagree); a high number also agreed that products do not sufficiently cover the costs of the harm that their production and use cause to the environment (40% agree or strongly agree; 20% disagree or strongly disagree). More also believe that products sold in the EU are less sustainable because economic actors do not have adequate and reliable information on the sustainability of products (54% agree or strongly agree, while 22% disagree or strongly disagree with this statement).

Problems related to the internal market are seen as significant contributors to the problem: a lack of harmonized requirements to foster the sustainable design of products was perceived by many (65% agreed or strongly agreed; 18% disagreed or strongly disagreed), and 65% agreed or strongly agreed that diverging national rules and lack of a harmonized set of EU rules discourage large businesses from offering more sustainable products, compared to only 17% who disagree or strongly disagree.

Views on options: industry support varied depending on action in question: support for requiring a reparability score on products was comparatively low (23% favouring or strongly favouring; 34% disagreeing or strongly disagreeing), as was support for banning substances inhibiting recyclability (35% versus 37% respectively). In contrast, the idea of requiring information on environmental footprint in a Digital Product Passport was well received (68% agree or strongly agree; 9% disagree or strongly disagree), as was that of requiring information on social conditions along the value chain (44% agree or strongly agree; 23% disagree or strongly disagree).

Quite high support on options to incentivise sustainable products: 61% supported or strongly supported the idea of modulating producer fees under Extended Producer Responsibility schemes based on the sustainability of products (compared to 32% who expressed middle, low or very low preference for this). The idea of identifying classes of product performance was supported or strongly supported by 53%, while 41% expressed middle, low or very low preference for this. The idea of introducing mandatory Green Public Procurement criteria received quite high support: 59% supported or strongly supported it, while 27% expressed middle, low or very low preference for this.

On monitoring and enforcement, low support for requiring third-party certification or inspection to simplify the work of Member State enforcement authorities: 53% expressed middle, low or very low support, while 28% were supportive or very supportive.

2. EU citizens and consumer organisations views

Problem definition: *very strong support on aspects related to the problem definition:* 93% agree that products are not currently designed to be easily repaired or upgraded (only 4% disagree or strongly disagree); 91% agree that products do not sufficiently cover the costs of the harm that their production and use cause to the environment (4% disagree or strongly disagree). 87% agree or strongly agree that product repair costs are too high compared to buying new products (8.6% disagree or strongly disagree). 75% agree or strongly agree that voluntary approaches, such as labelling, do not provide sufficient incentives for businesses to offer more sustainable products (7.5% disagree or strongly disagree).

Views on options: *strong support for a majority of the measures included in the preferred options of this impact assessment:* 69% favoured or strongly favored the possibility of requiring a reparability score on products (15% disagreed or strongly disagreed with this), and 71,5% favoured or strongly favored banning substances inhibiting recyclability (15% disagreed or strongly disagreed). 88% agreed or strongly agreed with requiring information on environmental footprint in the Digital Product Passport (6% disagreed or strongly disagreed), and 85% agreed or strongly agreed with requiring information on social conditions along the value chain (6% disagreed or strongly disagreed). 78% supported or strongly supported the idea of modulating producer fees under Extended Producer Responsibility schemes based on the sustainability of products.

Strong support for options on incentives: 76% also expressed support or strong support for the idea of identifying classes of product performance. The idea of introducing mandatory Green Public Procurement criteria received overwhelming support (84% supported or strongly supported it).

On monitoring and enforcement, support for requiring third-party certification or inspection to simplify the work of Member State enforcement authorities was relatively high: 60% were supportive or very supportive while 31% expressed middle, low or very low support.

3. Environmental organisation and NGOs

Problem definition: *very strong support for problems identified:* 95% agree or strongly agree that products do not sufficiently cover the costs of the harm that their production and use cause to the environment and 88% agree or strongly agree that many products are not designed to be easily repaired or upgraded. 76% agree or strongly agree that materials used in products are more and more complex and difficult to recycle, and 78% that agree or strongly agree that that economic actors do not have adequate and reliable information on the sustainability of products.

This stakeholder category also recognized that issues related to the internal market are contributing to the problem: 92% agreed or strongly agreed that there is a lack of harmonized requirements to foster the sustainable design of products (only 7% disagreed or were neutral, with no respondent strongly disagreeing), and 69% agreed or strongly agreed that diverging national rules and lack of a harmonized set of EU rules discourage large businesses from offering more sustainable products, compared to 24% who disagreed, strongly disagreed or were neutral.

Views on options: *very strong support for a majority of the measures included in the preferred options of this impact assessment:* 70% favoured or strongly favored requiring a reparability score on products (19% disagreed, strongly disagreed or were neutral). 76% favoured or strongly favored banning substances inhibiting recyclability (17% disagreed, strongly disagreed or were neutral), and requiring information on a product's average expected lifespan to be provided with a product was supported or strongly supported by 53% (39% disagreed, strongly disagreed or were neutral). 92% agreed or strongly agreed that information on environmental footprint should be collected as part of the Digital Product Passport, and 90% agreed or strongly agreed with

requiring information on social conditions along the value chain. 91% supported or strongly supported the idea of introducing mandatory Green Public Procurement criteria.

4. EU Public Authorities

Problem definition: Public authorities in the EU expressed very strong overall agreement with the main problems identified in this impact assessment: 80% agreed or strongly agreed that economic actors do not have adequate and reliable information on the sustainability of products (only 17% disagreed, strongly disagreed or were neutral), and 100% agreed or strongly agreed that many products are not designed to be easily repaired or upgraded (with none disagreeing). 90% agreed or strongly agreed that products do not sufficiently cover the costs of the harm that their production and use cause to the environment (with none disagreeing). 90% also said that materials used in products are more and more complex and difficult to recycle.

Internal market fragmentation is recognised by EU authorities as an issue: Over 95% agreed or strongly agreed that there is no harmonized set of requirements to foster the sustainable design of products placed on the EU market, and 70% agreed or strongly agreed that diverging national rules and lack of a harmonized set of EU rules discourage large cross-border businesses from offering more sustainable products.

90% agreed or strongly agreed that voluntary approaches, such as labelling, do not provide sufficient incentives for businesses to offer more sustainable products.

Views on options: Strong support for action on reparability: 87% favoured or strongly favored requiring information on reparability to be provided on or with a product and 73% expressed the same responses for requiring a reparability score on products (20% disagreed, strongly disagreed or were neutral here). 83% support or strongly support requiring modular design of their products.

Action on product content also strongly supported: 93% favored or strongly favored banning substances inhibiting recyclability, and 87% agreed or strongly agreed that information on recycled content of each material present in a product should be collected as part of the Digital Product Passport.

Positive views on options on incentives: 90% supported or strongly supported modulating producer fees under Extended Producer Responsibility schemes based on the sustainability of products, and 83% supported or strongly supported the idea of identifying different classes of sustainability performance for products at EU level. 87% supported or strongly supported introduction of mandatory Green Public Procurement criteria.

More mixed views on monitoring and enforcement: requiring third-party certification or inspection had mixed levels of support - 50% supported or strongly supported while 50% expressed low, very low or neutral support levels. 87% supported or strongly supported the idea of the European Commission providing accompanying measures to Member States (e.g. guidance, support etc.). It should also be noted that there was low support for the idea of distributing of surveillance tasks amongst Member States per product category: 80% expressed low, very low or neutral support levels.

WORKSHOPS

Between 15 April and 15 June 2021, six dedicated workshops were organised on different topics. The seventh workshop dedicated to Member States took place on 9 July 2021. The workshops were widely attended by participants from a number of different stakeholder groups, including business associations, company/business organisation representatives, academics, NGOs, environmental and

social organisations, as well as Member State representatives. A short summary of each workshop is provided below.

Workshop #1 - Introduction to Impact Assessment work on the SPI

The first workshop took place on 15 April 2021, with 460 registered participants. The aim of the introductory workshop was to present to a broad audience of stakeholders the work being carried out by the external contractors in the context of the study to support the preparation of the current Impact Assessment, including each of the study's tasks. Stakeholders also received information on upcoming consultation activities and how they could participate in them. Stakeholders were also able to engage and ask questions in relation to SPI.

Workshop #2 - Policy support for Circular Business Models

The second workshop took place on 27 April 2021 and aimed at receiving feedback from stakeholders on the analysis carried out in the context of the above-mentioned study on Circular Business Models (CBM), and to discuss how policy mixes can be used to support the envisaged revision of the Eco-design Directive to achieve the SPI objectives. 78 stakeholders participated in the workshop.

Overall, the discussions showed that, in relation to CBM, there is a need to design policies that are not too prescriptive and to focus on improving incentives for circular product design. Further, the need for developing better indicators to determine what success means for CBM was also highlighted. In addition, there is a need to ensure that there are no contradictions between instruments (e.g. eco-modulation and provisions of Ecodesign Directive in the case of the lighting products industry). There was consensus on the need to focus on driving demand and for independent product assessments to ensure that instruments fulfil their purpose. It was also agreed that it was necessary to address the need for additional investments.

Workshop #3 - Digital Product Passport

The third workshop focused on the Digital Product Passport and was held on 29 April 2021, with around 180 stakeholders attending. The workshop included breakout sessions, where four main themes concerning the Digital Product Passport were discussed in 9 different parallel sessions, covering four different topic areas. Topic area A covered Use cases: potential applications for companies, users and authorities; Topic area B was on Governance, standards and international dimension; Topic area C on Technological approaches and solutions, including the role of blockchain; and Topic area D on Data access, accountability and management, including existing building blocks that could be used for sharing public and private data.

Workshop #4 - Social Aspects

The fourth workshop focused social aspects and was held on 6 May 2021, with around 75 stakeholders attending. The workshop was made up of a plenary session that also included a Q&A session, as well as three parallel breakout sessions. The parallel sessions considered discussion questions on the practical implementation of social aspects into SPI. Stakeholders were split in their opinion on whether it is feasible to address social aspects through product policy tools or on whether requirements on product value chains can complement/add value to requirements on companies. Stakeholders agreed that addressing social aspects is feasible, but it is difficult to monitor. Therefore, the complexity of implementation and enforcement should be considered. Others pointed out that, for public authorities, access to product-level information on social dimensions would facilitate making more sustainable procurement choices, as procurement rules often stipulate that only product-level criteria can be taken into account (rather e.g. than company-level criteria). Social aspects that could be addressed in the context of product policy tools mentioned included consumer rights (e.g. right to

repair), labour conditions, rights of indigenous people and child labour. The DPP was suggested as the tool for gathering the information to assess the social aspects of a product. It was suggested that assessments could also be carried out independently in order to ensure transparency.

Workshop #5 - Revision of Ecodesign Rules

The fifth workshop on the ‘Revision of Ecodesign Rules’ was held on 17 May 2021. During this workshop, around 180 stakeholders attended. The workshop was made up of a plenary session that included a Q&A session, followed by seven parallel breakout sessions. The parallel sessions considered discussion questions about the measures and processes related to Ecodesign rules, and how they could be changed/improved for the varying industries represented in the session. During this workshop, there was disagreement among participants on whether regulations should be product-specific or generalised. However, there was a general call for clarity on definitions of sustainability, durability and how circularity will consider standards for material efficiency. There was also consensus that circularity should be based on existing scientific methods, such as through life cycle assessments. There was a broad consensus on the need for recycling to be integrated in the Ecodesign legislation, but a challenge in doing so is that there simply is not enough data to enforce or check how much of the content is recycled. Some stakeholders argued that Ecodesign needs to be careful in expanding to other non-energy related product sectors, such as construction materials, for which comparable legislation, that addresses many sustainability aspects, already exists. Instead, there should be a recognition and coherence with sectoral legislation. A package approach should be dropped to facilitate adoption of specific production measures.

Workshop #6 - EU Member State Ecodesign practitioners

The sixth workshop was dedicated to EU Member States Ecodesign practitioners and took place on 15 June 2021, with 109 participants registered. The workshop aimed at collecting the experience of EU Member State representatives in the Ecodesign Process, including market surveillance authorities, as well as authorities involved in third party conformity assessment (in their personal capacity as practitioners). The workshop consisted of two sessions. During the morning session, the perspective from an upstream look at the Ecodesign regulations set up in the framework of the SPI was discussed. In the afternoon session, the downstream requirements for implementing and enforcing the Ecodesign Directive were discussed.

Workshop #7 - EU Member State workshop on SPI

The seventh workshop was focused on the views of Member State experts with regards to key topics of the SPI. The workshop took place on Friday, July 9th, 2021. 73 stakeholders registered for this workshop. The workshop consisted of a short, general introduction to the SPI, followed by an interactive plenary session based on questions shared in advanced with the participants on the policy options and measures considered in the Impact Assessment for SPI. The options discussed related to the extension of the scope of the Ecodesign Directive; to sustainability requirements for products; to sustainability information for consumers and supply chain actors; to rewarding more sustainable products through incentives; and measures for circular economy and value retention. On the whole, participants expressed support for a **scope (Option 2)** for SPI that would be open, and agreed with the list of products suggested for priority action (*see list in sub-option option 2a*). They felt the inclusion of services at this point in time might be premature. In relation to **sustainability requirements for products (Option 3)**, there was general support for requirements on durability and reparability, and a number of participants underlined the importance of requirements on recycled content, as well as high-quality recycling. General support for the use of the Product Environmental Footprint (PEF) method was expressed, even if some advised that setting minimum requirements on

carbon/environmental footprint for products might be complex and require additional time. Participants were supportive of the idea of having a set of sustainability principles applicable to all products, but advised that a product-specific approach will also be needed to complement and implement these in concrete terms. In general participants were also supportive of including due diligence requirements within SPI, underlining that coherence with other initiatives in this area (such as the upcoming Sustainable Corporate Governance initiative) should be ensured. On **sustainability information requirements (Option 4)**, there was a general feeling that increased product information will be key for advancing the objectives of SPI, and that consumers should also be a key target here. The idea of a European Digital Product Passport (EU DPP) was well received by participants, but some cautioned that such a passport should not be overloaded with too much information, and that it should remain simple to understand, also for consumers. General support was expressed for the possibility of setting classes of performance for products, and attempting to reduce administrative burden for economic operators by exploring if certain obligations (e.g. in relation to chemicals tracing) could be reduced via integration with the DPP/SPI requirements. In relation to **incentives (Option 5)**, general support for EU-level guidance was expressed, with some indicating it would be useful for them to receive information on successful economic instruments already in place in some EU countries. Linking these incentives to classes of performance was also well received, even if one participant expressed concern about how this would interact with existing incentives linked to the EU Ecolabel. Several participants said that mandatory Green Public Procurement criteria and targets set at EU level would be effective and welcome, but that these should be clear and easily applicable for procurements bodies, and should still facilitate innovation. In relation to measures on pricing, though many participants agreed that the low cost of many products is a barrier to more sustainable product choices, they strongly cautioned against SPI extending its focus in this direction, given the complexity of this area and political sensitivity. Finally, on measures for **circular economy and value-retention (Option 6)**, the idea of additional EU-level guidance for Member States (MS) on how to foster circular business models was deemed useful, as was the establishment of an information service on the subject. In general, there was support for the suggestion of an EU-wide prohibition on the destruction of unsold goods, but one participant underlined that this should be accompanied by the collection of more data on this issue on the European level.

FIRST SME SURVEY

The objective of the SME survey was to gather the views of small and medium-sized enterprises (SME) with a higher degree of detail in comparison to the Open Public Consultation. As part of this SME Survey, a tailored questionnaire was developed, focusing on company environmental/social impact and engagement in sustainable products, circular business models, economic and reputational incentives for product sustainability, the Digital Product Passport and management of unsold consumer products.

Over the course of the 6-week period, from 26 April until 15 June the survey received 332 responses, with 90% of the respondents being Enterprise Europe Network¹⁰ (EEN) members. Over 50% of the respondents were located in four EU Member States: France (15%), Germany (15%), Poland (15%), and Romania (12%). In total, respondents from 17 different countries were represented. More than half of the companies who responded are active in industry (56%), followed by services (21%) and

¹⁰ <https://een.ec.europa.eu/>

wholesale and retail trade (11%). 43% of the companies deal with final products, 11% with intermediary products and 40% with both. 41% of the responding SMEs operate cross-border at EU level, followed by national level (29%) and local/regional level (29%). 8% are self-employed (0 employees); 35% are micro (1-9 employees); 32% are small (10-49 employees); and 24% are medium sized (50-249 employees).

Summary of first SME survey

Company environmental/social impact and engagement in sustainable products

Overall, SMEs who responded to the survey are quite engaged in the sustainable product transition and are to some extent aware of their impact. Most of them can estimate their environmental and social impacts at least to some extent, with 53% fully or to a large extent. Almost half of the SMEs surveyed are currently introducing more sustainable products to the European market frequently (24%) or almost always (21%). In terms of innovation activities, they are more frequently engaged in sustainable product innovation compared to regular product renovation. The SMEs surveyed are less frequently engaged in innovation concerning circularity, and to a lesser extent with innovation concerning social aspects and eco-design.

Circular business models

In order to drive the uptake of circular business models, regulation and incentives to incentivise innovation in sustainable products and enable circular business models are valid options, in addition to sufficient access to financing. SMEs are not very familiar with new circular business models. Though, of the new models, they are most familiar with green supply chain management, shorter supply chains and product-service systems where buyers do not necessarily buy a product but rather services associated with the product. SMEs are least familiar with eco-design models and social models (giving model, social mission model, etc.). Of the established circular business models, SMEs are most familiar with recycling/ upcycling, reuse network, industrial symbiosis and customer advice on repairs. Of the established models, SMEs are the least familiar with closed-loop production systems.

Economic and reputational incentives for product sustainability

According to the SMEs surveyed, the economic incentives with the greatest benefit are direct subsidies and other financial incentives (tax exceptions/VAT reductions) linked to products that meet certain sustainability criteria. This is followed by conditions attached to EU financing instruments and state aid; circular innovation vouchers; eco-vouchers; and product standards based on International Organization for Standardization (ISO) guidelines. Particularly, procurement measures (public procurement of innovation, green public procurement, circular public procurement) would have average/limited benefits. Modulated producer responsibility fees are expected to have the least benefits. According to the SME respondents, minimum ratio requirements of sustainable products in total public procurement would have no (29%) or only a moderate (23%) impact on their sales. Eco-labelling based on environmental impact of products and services as well as sustainability labelling based on environmental, social and circularity impact as a reputation incentive are expected to have high benefits. To a lesser extent SME respondents also support facilities for development of circular business models patterns and 'green deals' that combine support for the removal of regulatory barriers and R&D funding. The Product Environmental Footprint (PEF) is seen as having higher benefits than the Organisation Environmental Footprint (OEF). EU Eco-management, audit schemes, sustainability oriented non-financial disclosure requirements are seen to have limited benefits.

Digital Product Passport

Introducing a European Digital Product Passport (EU DPP) is expected to have some environmental, social and economic impacts. The main environmental impacts expected by SME respondents are increasing the amount of products with low greenhouse gas emissions and lowering pollution levels, followed by gradually phasing out the use of environmentally harmful materials in products on the EU market and mitigating biodiversity loss. The main social impact expected is that of increasing consumer empowerment due to greater availability of product information, followed by improving working conditions and reducing environmental crime at a global level. The main economic impact expected is that of an increasing administrative burden due to higher monitoring and reporting obligations, followed by increasing economic returns for EU companies and decoupling of economic growth from environmental impact in the EU.

Unsold consumer products

SME respondents are most likely to handle unsold consumer products by systematically discounting the price until they are sold to a customer or recovering materials from unsold products (or sending them to professional recovery/recycling services) and they are *least likely* to send them to be incinerated or landfilled or return them to suppliers (or manufacturers).

SECOND TARGETED SME SURVEY

A second **targeted SME survey** was held from 20 October to 4 November 2021. This survey built on the first SME survey outlined above, and drew primarily on the knowledge and expertise of organisations representing SMEs (Enterprise Europe Network (EEN) contact points and other SME representative bodies) to gain a better understanding of the potential impact on SMEs of some of the main options examined in the current impact assessment.

Respondents were requested to reply on behalf of the SMEs that they represented, based on their familiarity with SMEs and their business practices.

The targeted survey received 35 replies. Responding organisations indicated they were located in the following EU Member States: Belgium, Denmark, Germany, Spain, Italy, Poland and Portugal.

Below is a summary of main results of this survey:

A. Sustainability requirements for products

Indication that product sustainability requirements (such as relating to *reparability, durability and reusability*) may give rise to some negative impacts for SMEs (such as medium to high administrative or compliance costs) but bring added value over time:

- 43% believe that the introduction of product sustainability requirements (such product relating to *reparability, durability and reusability*) would have **some negative impacts on SMEs, but that these would likely be offset over time** (e.g. due to reduced material use and expenditure; increased customer loyalty; better access to the market for greener products; reputational benefits etc.);
- 23% said it would have **mostly positive impacts** (for instance the increase in maintenance and repair activities induced by these requirements will specifically favour SMEs, as these are

strongly represented in these activities); and 17% foresaw **more benefits than negative impacts**.

- 9% believed such requirements would result in some negative impacts (e.g. with no added benefits), while no respondent believed such requirements would bring purely negative impacts.
- **Administrative costs:** 31% of respondents suggested such requirements would option entail **medium levels of administrative costs for SMEs** (i.e. 3/5 on a scale of 1 to 5¹¹). However, those indicating **high** (i.e. 5/5 on the scale) **or quite high** (i.e. 4/5 on the scale) **administrative costs** were 11% and 29% respectively, making a total of 40%.
- **Compliance costs:** 40% of respondents suggested such requirements would option entail **quite high levels compliance costs for SMEs** (i.e. 4/5 on the scale). 29% suggested medium levels of compliance costs (3/5) while 14% suggested high compliance costs (5/5).

Indication that minimum recycled content requirements are likely to cause some negative impacts for SMEs (such as medium to high administrative or compliance costs) but bring added value over time:

- 57% believe that introducing requirements on minimum recycled content in products would have **some negative impacts, but these would likely be offset over time** (e.g. due to reduced material costs etc.).
- 17% foresaw **some negative impacts only**.
- 11% foresaw **more benefits than negative impacts**.
- **Administrative costs:** 40% of respondents indicated that such requirements would entail **medium levels of administrative costs for SMEs** (number 3/5 on a scale of 1 to 5). Those indicating **high** (i.e. 5/5 on the scale) **or quite high** (i.e. 4/5 on the scale) administrative costs were 9% and 26% respectively.
- **Compliance costs:** 34% indicated that such requirements would entail **quite high levels compliance costs for SMEs** (i.e. 4/5 on the scale). 31% suggested medium levels of compliance costs (3/5) while 9% suggested high compliance costs (5/5).

B. Information requirements for products

Mixed views on likely impact on SMEs of requirements to provide information on the ecological profile of products: strong indication that though these may cause some negative impacts (such as medium to high administrative or compliance costs) they may bring added value over time; risk nevertheless signalled by some of potential for high negative impact:

- Almost half of respondents (49%) indicate ecological profile information requirements are likely to cause **some negative impacts, but these would likely be absorbed over time and bring added value from a business point of view** for SMEs.
- Approximately a fifth (17%) nevertheless believe that this could entail **very high negative impact, including high additional costs**.
- 11% indicate that this would entail **positive overall impact**.
- 86% of **respondents** indicated that ‘a small number’ of SMEs would currently be able to measure the impact of the products they place on the market using a Life-Cycle Assessment method (such as PEF).

¹¹ Where 1 indicates low cost and 5 indicates high costs, e.g. over 5% of a company's total administrative or operating costs

Mixed views on impact of requiring SMEs to provide information on social conditions of production:

- 20% believe this would lead to **some negative impact, but it would likely be offset over time and bring added value from a business point of view**;
- 17% believe **there would be little or no negative impact involved in complying with these rules (e.g. because such requirements are already being applied)**, while 14% believe this would be **impossible to comply with given the complexity of the supply chain** and another 14% that this would entail **very high negative impact: much effort would be required and there would be little added return from a business point of view**.
- 11% believe it would bring **positive overall impact**.

Indication that the administrative and compliance costs associated with the above-mentioned information requirements would be would be medium to high for SMEs:

- **Administrative costs:** 31% of respondents indicated that such requirements would entail **medium levels of administrative costs for SMEs** (number 3/5 on a scale of 1 to 5). Those indicating **high** (i.e. 5/5 on the scale) **or quite high** (i.e. 4/5 on the scale) administrative costs were 20% and 23% respectively, together outweighing the medium response category.
- **Compliance costs:** 37% indicated that such requirements would entail **medium levels of compliance costs for SMEs** (i.e. 3/5 on the scale). Those indicating **high** (i.e. 5/5 on the scale) **or quite high** (i.e. 4/5 on the scale) compliance costs were 20% and 23% respectively, together outweighing the medium response category.

C. Digital Product Passport

The following three **impacts** on SMEs were deemed most likely to result from the introduction of a digital product passport:

1. Promote **greater transparency** along the supply chain
2. **Encourage consumers** to opt for more sustainable products
3. Better **knowledge of own product supply chain**

In close fourth place was the response: ‘**Generate additional IT costs/administrative costs to access the market**’.

D. Incentives for sustainable products

Indication that mandatory Green Public Procurement criteria may bring positive benefits for SMEs:

- 40% believe that mandatorily GPP would **bring positive impact for SMEs, as it would help boost demand for SME products**. 26% indicated that this could potentially bring benefits for SME products, but this cannot be guaranteed.
- 9% see **potentially negative impact**, as SME products would be less likely to be procured by public authorities; 6% foresee **neutral or very little overall impact**.

Indication that linking incentives to classes of product performance may bring positive benefits for SMEs:

- 37% indicated that linking incentives in this way **may bring potential benefits for SME products, but this cannot be guaranteed**, while 34% believe it would bring **positive impact by helping to boost demand for some SME products and incentivise sustainable product innovation**.
- 11% foresee **neutral or very little overall impact** while 9% see **potentially negative impact**, as SME products would be less likely to benefit from these schemes and would therefore be purchased less.

Mixed to poor indication that modulation of EPR fees according to classes of performance would be of benefit for SMEs:

- 34% indicated that such a measure could **potentially have positive impacts on SMEs but this cannot be guaranteed**.
- Closely behind this, however, 29% indicated that it would have a **negative impact, as SMEs would be less likely to benefit from such fee modulation and would therefore miss out**.
- 17% foresaw a **purely positive impact** from this measure for SMEs.

E. Measures for circular economy and value retention

Suggestion that an EU-wide ban on destruction of unsold durable goods may have a positive overall impact on some SME business models, while others many remain largely unaffected by such a ban. Risk nevertheless signalled that some SMEs may experience negative effects due to the need to find alternative options for these goods:

- 37% indicated that such a measure would have **positive impact** on SMEs, as it could help foster new business models and approaches. 29% indicated there would be **neutral or no impact**, as destroying unsold durable goods is not a widespread practice amongst SMEs.
- 20% indicated such a measure could lead to **some negative impact for SMEs**, as other methods of dealing with unsold durable goods would need to be identified, while 6% foresaw a **purely negative impact**, given that for some SMEs, destruction is the only viable option for dealing with unsold durable goods.

F. Market surveillance and enforcement

Indication that improved market surveillance and enforcement of product compliance would benefit SMEs:

- 51% indicated that improved surveillance and enforcement would have a **positive impact on by creating a level playing field** for them.
- 11% foresaw **purely negative impacts for SMEs, as it would imply additional administrative burden** for them, while 14% foresaw **some negative impact** for SMEs.

G. Mitigation measures for SMEs

The following three **mitigation measures** were deemed most likely to be of assistance to SMEs in complying with future product sustainability requirements:

1. **Assistance with environmental and carbon footprint calculation/life cycle assessment methods, including PEF** (such as the availability of simplified calculation tools, access to low-cost expertise Life Cycle Assessments, access to software and databases enabling the performance of Life Cycle Assessments, and support through existing funding and financing tools);
2. **Dedicated legal provisions:** such as longer transitional periods for SMEs
3. **Simplified SME procedures:** e.g. for reporting

TARGETED STAKEHOLDER SURVEY

To gather views of expert stakeholders, tailored questionnaires were developed for stakeholder groups particularly relevant for the preparation of SPI. This targeted consultation was open from 20 May 2021 to 9 June 2021 and received 136 responses, of which 35% came from manufacturers/importers¹², followed by *other*¹³(26%), NGOs (11%), public authorities (10%), waste operators¹⁴ (7%), retailers (6%) and academic/research institutions (5%). Most of the organisations operate at global (43%) or EU (38%) level and most are SMEs (<250 employees) (66%), with the rest being large (≥250) (33%).

Stakeholder comparison

Across the tailored questionnaires, some aspects overlapped, including sustainable product drivers and hurdles, drivers of unsustainable products, sustainable product requirements, circular business models, Digital Product Passport (DPP), environmental footprint calculation, and existing social impact assessment frameworks.

Drivers of the sustainable product transition - Both manufacturers and retailers agree that the presence of market opportunities and incentives (which enable circular business models and innovation in sustainable products) are key drivers.

Drivers of unsustainable products - NGOs and academia tend to agree that unsustainable products are greatly driven by market-related, legislative as well as consumer behavioural aspects. Financial incentives (i.e. malus schemes, taxation) could be used to phase out unsustainable products.

Sustainable product transition hurdles - Lack of clear, comprehensive and binding legislation and of trustworthy information on working and environmental conditions along the supply chain are all big hurdles for manufacturers, retailers and waste operators. Generating new business opportunities and inadequate enforcement of sustainability requirements are also big challenges for manufacturers.

Sustainable product requirements - Requirements already foreseen in the existing Ecodesign directive are expected to elicit the most effort from manufacturers, though these are expected to

¹² From now on referred to as “manufacturers”.

¹³ Mostly business associations.

¹⁴ And value-retaining and -recovering operators.

provide the highest benefit (via NGOs) and have a large impact on reducing the environmental/social impact of products (via academic/research institutions).

Circular Business Models - The sectors with the highest circularity potential are packaging, plastics, textiles and electronics & ICT. Manufacturers see the greatest potential in recycling and repair, whereas retailers see potential in a larger variety of CBMs, such as product-service systems, repair, recycling, refurbishment and upcycling.

Digital Product Passport (DPP) information - Including *identity information* in DPP would elicit high effort¹⁵ and provide low competitive advantage to manufacturers as well as limited benefits to consumers (via retailers), though it would be beneficial (via NGOs), and have a large impact on reducing the environmental/social impact of products (via academia).

Technical information would elicit medium effort with medium competitive advantage and limited benefits to consumers, but high benefits (via NGOs) and large impact.

Environmental/social sustainability information would elicit high effort and low competitive advantage, some benefits to consumers, high benefits (via NGOs) and have a large/medium impact.

Information to other players along the lifecycle would elicit some effort for certain aspects (i.e. material composition) and provide low competitive advantage and would provide low benefit to consumers.

Environmental footprint - Product Environmental Footprint (PEF) and Organisation Environmental Footprint (OEF) are considered appropriate for setting product performance requirements to some extent for manufacturers, academia and public authorities and to a large extent for NGOs.

Social impact assessment frameworks – NGOs, academia and public authorities suggest social LCAs¹⁶, due diligence criteria¹⁷, sustainability certifications¹⁸ and interest groups¹⁹ as existing frameworks to assess social impact of products.

Legislative overlap - Some stakeholders want to ensure there is no overlap between different EU initiatives that are related to product design to reduce administrative burden.

Manufacturers/importers

Manufacturers are greatly involved in sustainable/circular product innovation and roughly half are involved in CBMs. A pan-European facility to support CBMs should provide technical support, advisory services, and financial support. Several manufacturers explained that reverse logistics models and additional mandatory product labelling/information requirements are not very effective and could have negative economic and administrative impacts. On-demand and modular production models on the other hand hold large potential. Some recommend that SPI legislation should be business model neutral by setting sustainability goals while giving manufacturers the flexibility to select business models to fulfil these goals. Quite a few manufacturers also highlighted the

¹⁵ Mainly developing unique ID number of part assembled would elicit high effort.

¹⁶ UNEP-SETAC-Life Cycle Initiative; UNEP Guidelines for social LCA.

¹⁷ OECD Practical Tool on Environmental Due Diligence in Mineral Supply Chains; min. Do Not Significant Harm criteria.

¹⁸ Fair trade certification or the Cradle to Cradle Platinum level Certification.

¹⁹ Interest Group for Circular and Green Economy (IG-CGE).

importance of assessing positive and negative impacts of circular economy models per sector/product group.

DPP is expected to lead to a reduction of the greenhouse gas emissions of products, though it would have limited social impact and increase administrative burden. At its core, the DPPs should foster the transition to a circular economy by gathering data on reuse, sorting, recycling and new CBMs and consolidate sustainability/socio-economic product information. DPP can also improve harmonisation and reduce regulatory compliance costs. Alternatively, a simple design of DPPs would make administrative costs more feasible. DPP should be applied to imported products to create a level playing field and be based on existing legislation to reduce burden. Several manufacturers think that DPP is more appropriate for B2C and not B2B. There is also concern that DPPs would impact the privacy of sensitive company information. Sector-specific issues with DPP implementation are also highlighted. Additionally, certain sectors express opposition to being included in SPI entirely, including cement, packaging, portable batteries and safes (i.e. vaults).

Retailers

For retailers, the sustainable product transition is expected to enhance cooperation with manufacturers and waste operators, but disproportionately increase administrative burden. Information provided by manufacturers to dealers meant to empower consumers needs to be accessible, understandable, but also comprehensive. Some optional tools for consumer awareness are a *performance scale* including a baseline and comparative tool, combined with a *layered approach* to not overwhelm consumers. New information access solutions are needed for the digital age in various formats and various channels. Additionally, they are of the view that industry-led innovation should be trusted by the European Commission.

Value-retaining and -recovering operators and waste operators

The transition to sustainable products is expected to create new business opportunities in this sector. The main barriers for repair and reuse are low prices of new products and limited availability of spare parts. The transition will mainly impact this sector by enhancing cooperation with manufacturers and increasing business/job opportunities and profitability. Incentives are needed to stimulate further repair and recycling of products. Some examples and best practices are: *minimum mandatory recycled content*, deposit return schemes, penalising/rewarding based on environmental impact of materials, design-for-recycling, standardisation bodies providing guidelines and assessment for new packaging types, VAT reductions, repair bonus/vouchers, and repair pop-ups.

NGOs

According to NGOs, the main problems with sustainability of products are: too much focus on simple indicators instead of more complicated aspects such as marketing and consumer motivations; need more feasible, holistic circular pathways; need to focus on overconsumption; how consumer preferences will translate to circular practises; and lack of combining technology and design innovation. On social aspects, more reliable information and targeted policy is needed.

Academic/research institutions

Academia expects that the transition will have a macroeconomic impact by harmonising the EU internal market and increasing technological development. In terms of a socioeconomic impact, the transition will increase the average lifespan of products on the EU market, increase the level of consumer empowerment and increase consumer access to more sustainable/circular products at a global level.

EU and Member States authorities

GPP mandatory ratios are expected to cause problems for public procurers by the lack of properly trained personnel. Further, effectively enforcing product policies is hindered by high complexity of supply chains as well as high resource needs, insufficient testing budgets and lack of consensus about the need of these types of requirements. Market surveillance and policy enforcement by Member States could be further improved with more fiscal support, an EU-wide central database, clear verification methods and efficient information sharing between Member States. According to public authorities, more attention needs to be given to consumer awareness and needs, as well as developing management measures, limiting hazardous substances and developing clear definitions and robust verification methods for recycled material content calculations.

STAKEHOLDER INTERVIEWS

Stakeholder interviews were conducted with representatives of corporate interests, either with individual companies or with associations representing industrial sectors. Other interviewees included government representatives at Member State or municipal level, academics, and three representatives of civil society organisations (environmental and consumers NGOs). The interviews served to help further interpret the consultation results, discuss particularly complex or controversial issues (e.g. areas of strong disagreement between stakeholders), explore ways in which the options could be refined in order to address key concerns, or other new and emerging developments.

A total of 49 interviews were performed:

- 15 interviews on the priorities and key measures of the SPI;
- 11 interviews on existing initiatives to inspire the Digital Product Passport;
- 12 interviews on Circular Business Models;
- 11 interviews on economic incentives.

Priorities and key measures of SPI

Interviewees provided their views on the areas of measures foreseen in SPI: Scope of the Ecodesign legislation, Extension of sustainability requirements, Information requirements, Economic incentives for sustainable products, Support to Circular Business Models, Stronger application of the Ecodesign framework.

Scope of the Ecodesign legislation

Interviewees tended to be conservative regarding extension of the scope of Ecodesign requirements: the energy-related products and the others are considered to have different features deserving different legislative tools. The priority sectors cited for SPI include electronics, textiles and construction.

Extension of sustainability requirements

Sustainability requirements on products are considered as the most effective means to reduce their environmental impact, because not enough consumers are ready to pay more for sustainability. Corporate interviewees supported a product-specific approach to the requirements placed by SPI. They expressed readiness to comply with additional requirements, provided these are grounded in a robust Impact Assessment and the verification of compliance relies on high-quality testing standards. An expressed fear in the case of more requirements is the loss of competitiveness compared to non-

compliant products, because interviewees consider that Market Surveillance and customs authorities do not ensure sufficient compliance levels of products.

Some existing Ecodesign requirements are considered as difficult to assess upon placement of the product on the market (e.g. availability of spare parts). Some sustainability requirements foreseen in SPI are considered to be too costly to test (e.g. lifetime) or to comply with (e.g. remanufacturing information, recycled content). SMEs may find it challenging to test the durability of products, and may be in a difficult condition if the test fails. The introduction of requirements on recycled content would require investment, and hence time, to set up the relevant infrastructure for the collection, sorting and processing of end-of-life products to satisfy this new demand.

A key concern for NGOs is the cost of sustainable products compared to less sustainable ones, and that of maintenance / repair. There may be a conflict to access recovered products between the players of re-use / remanufacturing and recyclers. Some sustainability requirements can lead to a very deep transformation, even a re-invention for some sectors, which would come to an economic and social cost. Also the cost of verifying the sustainability claims along the value chain may be very high.

The EU skills base for the processing of materials, including secondary raw materials, has diminished in the 1980s and 1990s. This can hinder the deployment of circular solutions. Beyond this, no big shift in skills or jobs is expected, but rather a “greening” of existing occupations. A key issue is the enforceability of the measures foreseen, considering the low resources available in Member States for Market Surveillance and customs, specifically considering the large number of imported products with low sustainability.

Information requirements

The volume of data collection on the environmental and social sustainability along the value chain is considered to be potentially high, specifically in global, fragmented value chains. There is a strong need for uniform requirements regarding the nature of the data collected, and for robust systems ensuring its veracity. The basis of the system is the unique identifier of the product. There is a huge need for digital product passport to enable companies and consumers to know which materials have been used and how these products could be repaired and maintained.

Economic incentives for sustainable products

The economic support for sustainable products would need to be restricted to only those products that demonstrate their low environmental impact, along LCA-based methods.

Green Public Procurement would benefit from being mandatory and would benefit from pooling expertise between several administrations, because competence of procurers is still low. Taxation measures would need to consider their distributional impacts. The modulation of VAT and of EPR fees bears on small amounts and has thus limited effect. The current proliferation of labels is seen as reducing their effectiveness.

Support to Circular Business Models

Greater impact can be expected from large companies converting to CBM, rather than from circular-native start-ups. Product-Service Systems require more capital, and no support is available. They also create more transaction costs. Sensors and Internet of Things are technical enablers. The transmission of skills is also an enabler, provided the business case for CBM is there. The second-hand market is booming already for textile products. The repair café movement has risen fast but remains marginal. However, the price of many new products is often so low that it makes no sense to maintain or repair

them. Maintenance and repair are often hindered by the lack of necessary information. Industrial Symbiosis and re-use / remanufacturing would need to be supported by rules that enable an easier movement of secondary materials and of discarded products.

Stronger application of the Ecodesign framework

The process for defining the current Ecodesign work plan is considered as good but delayed by supposed capacity constraints at the European Commission.

Existing experiences to inspire the design of the Digital Product Passport

The interviews provided an insight into the features of existing initiatives that can be relevant for designing the Digital Product Passport. The recommendations received that were supported by a consensus of interviewees were:

1. A decentralised system would be more applicable to the DPP developed under the SPI than a centralised one;
2. Bringing together and building upon existing initiatives when developing the DPP under the SPI;
3. The DPP needs an international perspective and approach;
4. The DPP should be based on open source, interoperability and ensure access for everybody;
5. Clarify and harmonise the terminology used and standardisation applied.

Other recommendations were provided by specific interviewees:

1. Include social and environmental impacts;
2. Resolve potential resistance beforehand;
3. Confidentiality needs to be considered in the design phase of the DPP already;
4. For the specification of the system, it is crucial to have IT developers and database experts on board;
5. For the long-term implementation, consider to include independent parties to ensure trustworthiness;
6. Regulation should prescribe the data that is mandated in the DPP in order to facilitate its uptake and be clear regarding what is optional.

Annex 3: Who is affected and how?

PRACTICAL IMPLICATIONS OF THE INITIATIVE

The vast majority of impacts of the preferred option would materialise through the adoption of SPI measures for specific products or product groups, setting out concrete requirements and obligations for economic actors. At this point in time, it is only possible to give a rough idea about the nature of the costs and benefits and it has to be kept in mind that these are dependent on concrete elements and modalities still to be decided in the future at the level of SPI measures (which will be accompanied by separate impact assessments, and preceded by inclusive consultation processes). Moreover, the longer the timeframe, the bigger the uncertainties in any assessment. It is therefore not possible to provide a fully meaningful quantitative assessment of impacts, as even the sign of the impacts (increase + or decrease -) is in many cases not possible to predict.

Having said that, this annex tries to provide an overview of the main consequences for different types of stakeholders that are likely to stem from the preferred option.

The extension of the product scope of the Ecodesign framework (option 2) and of the sustainability requirements (option 3) beyond energy use together with the introduction of the digital product passport (option 4) will imply additional administrative burdens and compliance costs for economic actors involved in the production and selling of products covered by SPI measures. Where harmonised requirements at EU level replace several existing or planned national requirements, however, this could result in an overall reduction of compliance costs. More sustainable product design will also require an increase in product R&D costs. However, it is likely that most of the costs will be passed on to consumers, who are likely to face somewhat higher prices for those goods when purchased as new, but who are also likely to benefit from those goods having for instance increased durability and higher resale value. Moreover, enhanced circularity will not only imply additional business for repairers, second-hand resellers etc. many of which are SMEs. It also offers consumers better access to second-hand products of high quality, which are expected to be cheaper than new ones. It is expected that enhanced circularity of products and increased implementation of circular business models will also – all else being equal – lead to a reduction in the demand for primary materials and for new products. Finally, enhanced recyclability of products, as well as possible future minimum requirements on recycled content in products, will offer additional business opportunities for the recycling sector. There is likely to be net economic benefits overall at a global level but it is clear that there will be winners and losers from individual SPI measures; if any individual SPI measure has net economic costs then it will only go ahead if justified on the basis of its environmental impacts.

For administrations, it implies the need for additional resources. The Commission will need additional human and financial resources to deliver the SPI measures envisaged and for the complementary EU level implementation and enforcement support capacities (option 7). Similarly, Member States authorities will require additional resources for market surveillance and customs enforcement while profiting from the EU level support capacities. Establishing linkages between classes of performances and economic incentives (option 5) and the promotion of circular business models (option 6) will also require some additional resources, including for monitoring uptake.

Extending the scope and sustainability requirements for new products will lead to environmental and social benefits (e.g., in terms of health and safety but also in terms of employment conditions), not only in the EU but also in third countries. Workers in the supply chains will have to acquire new skills. Employment effects are overall uncertain, except for primary resource production, where – ceteris paribus – a reduction in demand would be expected to entail a reduction in employment. On the opposite, additional employment could arise for recyclers of raw materials and repairers, as well

as for third party verifiers and certification providers. The new product requirements may encourage existing businesses to switch to or develop new revenue streams and avenue of business²⁰.

As regards impact on third countries, the preferred option will introduce requirements that are not more trade restrictive than necessary, to be applied in a non-discriminatory manner to European and non-European producers. Likewise, European producers would not be disadvantaged in their ability to function inside or outside Europe. In line with current EU international cooperation, the EU will provide continuous support to developing and least developed countries for the green transition. In particular, efforts will be made to mitigate possible adverse effects (via technology transfer and capacity building). Moreover, the measures of the revised Ecodesign legislation will be developed in a transparent manner and third countries and trading partner will be fully informed in the process.

At this stage, there are no obvious administrative costs generated for businesses and citizens that need to be considered as part of the Commission's 'one in, one out' programme. The initial administrative costs are limited to public authorities, and so are outside the scope of the exercise. Where administrative costs are identified below, these will follow from the implementing measures and so be analysed and reported (including offsetting) in the accompanying impact assessments carried out in line with the European Commission's Better Regulation Guidelines.

²⁰ Some businesses in France (Darty and FNAC) have started investing in the repair sector to generate additional revenue

Table 13 Summary of costs and benefits

| <i>I. Overview of direct and indirect Benefits and estimated costs (total for all provisions) – Preferred Option vs BAU</i> | | | |
|---|--|---|---|
| | <i>Businesses</i> | <i>National Authorities</i> | <i>Citizens and Consumers</i> |
| Option 2b | <p>Direct benefits:</p> <ul style="list-style-type: none"> To the extent that the scope extension replaces national laws (or prevents their emergence) with harmonised EU requirements, this would facilitate compliance and reduce costs for producers selling across the EU. <p>Indirect benefits:</p> <ul style="list-style-type: none"> Signalling function to businesses, “green” image etc. Savings along the value chain <p>Costs:</p> <ul style="list-style-type: none"> For producers of the products/product groups newly coming under the scope, there will be additional compliance costs for products falling under future SPI measures. The additional costs of another 30 SPI measures could be in a range of 30 to 60 billion Euros per annum when fully incurred | <p>Direct benefits: n.a.</p> <p>Indirect benefits:</p> <ul style="list-style-type: none"> Potentially, additional tax income from increased European market activity <p>Costs:</p> <ul style="list-style-type: none"> Need for additional staff. All Member States highlighted the issue of understaffing (especially in federal countries) that might imply an even larger number of additional FTEs needed. The costs for preparing additional SPI measures of around additional costs of around EUR 25 million per annum (costs spread across business and national authorities). | <p>Direct benefits:</p> <ul style="list-style-type: none"> Possibility for sustainable choices for a range of products beyond energy-using products <p>Indirect benefits:</p> <ul style="list-style-type: none"> Reduction of yearly electricity consumption Reduction of yearly emissions of relevant substances leading to positive health effects. Benefits are likely to be larger than the 30 to 60 billion Euros of costs per annum for businesses. |

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| <p>Option 3b</p> | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Improvement of the level playing field between companies in Europe. • In all manufacturing sectors: a shift in activity from production towards maintenance and more sustainable design leading to material savings • Availability of high-quality recycled materials • For recyclers: growth in the market of recycled materials and of their quality • Growth in the sector of repair services, refurbishment, and remanufacturing and thus jobs in these sectors, in particular social and solidarity economy organisations and SMEs • Positive impacts on innovation <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Better image of the manufacturing sector as contributing to the resolution of major environmental challenges, with benefits on attracting young, qualified talent <p>Costs:</p> <ul style="list-style-type: none"> • The three top cost drivers are the minimum requirements on recycled content on the product or components, imposing minimum requirements on re-manufacturability and minimum requirements to reduce carbon and environmental footprints and imposing | <p>Direct benefits: n.a.</p> <p>Indirect benefits:n.a.</p> <p>Costs:</p> <ul style="list-style-type: none"> • Compliance and enforcement of effective bans of products (Measure 3c.2) would imply the highest additional costs (significantly more than 2 FTEs). The complexity of enforcement and high costs related to it might be correlated to a low level of compliance from industries. | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Availability of more durable products, of better quality • Lower priced refurbished goods • Improved working conditions across the value chains • Higher probability of avoiding the catastrophic consequences of the planetary system crossing tipping points to irreversible evolution towards environmental conditions unsuitable for human civilisation or human life. • Health and environmental benefits because of reduction in pollution. Reduced GHG emissions of around 117 Mt CO₂e, with a monetary value of around EUR 12 billion per annum. In addition, reduction of 6% of EU particulate matter and 3% of EU resource depletion. <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Avoiding early failure of products prevents their early replacement and therefore reduces environmental impacts related to the production, transport, and disposal of new products. |
|-------------------------|--|---|--|

| | | | |
|-------------------------|---|--|---|
| | <p>minimum requirements on recycled content on the product or components.</p> <ul style="list-style-type: none"> • More specifically costs would additionally be driven by the need to increase testing capacities (investment in test equipment and space), the adaptation of production technology and (extensive) LCA to be performed for each type of product (time intensive). Verification costs of incoming raw materials would also significantly increase (according to two industry associations from the home appliance sector). • Overall industry associations estimate that more staff will be needed in the field of testing, quality management, warehouse management and marketing. • Decreasing activity for mining and quarrying sector | | |
| <p>Option 4b</p> | <p>Direct benefits:</p> <ul style="list-style-type: none"> • A long list of economic operators benefits from the information made available (maintainers, repairers, refurbishers, re-manufacturers, recyclers, logistics companies, retailers including on-line sellers, 2nd-hand retailers). • Increased efficiency (and hence lower costs and higher quality) of maintenance, repair and recycling • Market likely to reward good performers | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Increased efficiency of Market Surveillance and customs authorities <p>Indirect benefits: n.a.</p> <p>Costs:</p> <ul style="list-style-type: none"> • Implementation and enforcement costs for the digital passport. In particular, costs and complexity of verifying social requirements. • The costs for the Commission to set up the European Digital Product Passport are | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Reduced asymmetry of information helps making better informed choices • Availability of longer-life products, of better quality <p>Indirect benefits: n.a.</p> |

| | | | |
|--|--|---|--|
| | <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Possible front-runner position in the transition of manufacturing towards sustainability • Possible EU leadership in the development of IT solutions for the secure end-to-end communication of industrial data along the value chain and the product lifecycle, as a foundational stone of Industrial Internet of Things, in the framework of the European Data Space for Smart Circular Applications (EDSCA) <p>Costs:</p> <ul style="list-style-type: none"> • According to industry associations the two top cost drivers are the costs related to information requirements on a set of social indicators and Information requirements in the form of a Digital Product Passport. • Industry associations foresee upgraded IT systems to be put in place with an increase in testing staffing and personnel to keep data up-to-date and run the system. Some associations also fear unfair competition from non-complying (cheating) companies (false declaration). • Only one industry association declared that the SCIP Database implies high OPEX and administrative costs. All others agreed that this would not lead to significant costs as their sectors already | <p>estimated at around EUR 8 million as one-off investment and at least EUR 1 million as annual maintenance cost. The costs for business will depend on the SPI measures and the lessons from first experiences (which will act as a form of piloting).</p> | |
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| | show a high readiness level. | | |
| Option 5b | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Increased demand for sustainable products, including recycled / sustainable substitutes • Reduction of waste and increased availability of recycled material and of their quality • Improved information in terms of environmental impact of products and improvement of the level playing field between companies in Europe through classes of performance • Greater accessibility of repair services and growth in the sector of repair services • Competitive advantage for companies providing sustainable products • Increased research and development activities to develop sustainable products / services leading to innovative products and production processes <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Competitive advantage through operational performance improvement and better reputation <p>Costs:</p> <ul style="list-style-type: none"> • The main costs drivers are the investments required to comply with classes of performance. According to industry associations EPR schemes do | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Savings resulting from green public procurement • Increased efficiency of Market Surveillance and customs authorities • Job creation <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Skills development in relation to product life-cycle analysis • Potential fiscal revenues <p>Costs:</p> <ul style="list-style-type: none"> • According to Member State Representatives, the most important cost driver is the compliance with the new Ecodesign framework: it implies the recruitment of more than 5 FTEs. | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Increased number of collection points for specific products (e.g. batteries), easing the collection and recycling processes • Improved consumer satisfaction • Increased environmental awareness • Improved information in terms of environmental impact of products and services • Greater affordability of sustainable products in the medium term • Improved working conditions <p>Indirect benefits:</p> <ul style="list-style-type: none"> • New employment opportunities (e.g. recycling) • Improved safety, as labels often include requirements regarding chemicals and other hazardous products • Reduction in packaging waste |

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| | <p>not seem to significantly impact businesses.</p> <ul style="list-style-type: none"> • Increase in staffing will mostly result from the need to document the amounts of recycled materials in products. | | |
| Option 6b | <p>Direct benefits:</p> <ul style="list-style-type: none"> • New business opportunities for companies in terms of products or services provided, but also of partnerships • Competitive advantage through operational performance improvement and better reputation <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Greater B2B confidence • Savings from evolution of production and stock management practices <p>Costs:</p> <ul style="list-style-type: none"> • The main cost drivers according to industry associations are the ones related to the ban of the destruction of unsold/returned goods. | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Reduction of the waste collection and management costs of unsold goods <p>Indirect benefits:</p> <ul style="list-style-type: none"> • EU funding instruments being used for sustainable / circular projects developing local economies <p>Costs:</p> <p>At the MS level monitoring and enforcement cost on compliance with the ban on destruction of unsold goods.</p> | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Reduced environmental impact for goods and services by considering the whole life cycle • Increased accessibility of second-hand and donated products <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Greater B2C confidence • New employment opportunities (e.g. reverse logistics; repair; reuse; recycling, etc.) |
| Option 7c | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Streamlining processes can save time, make interactions in process more efficient • Provides opportunity for niche firms focused on sustainability | <p>Direct benefits:</p> <ul style="list-style-type: none"> • Improved information and data sharing improves understanding of products and markets and MSA activities and possibly customs enforcement | <p>Direct benefits:</p> <ul style="list-style-type: none"> • New routes to signal non-compliance • Consumer savings through shorter lead times and through reduction of non-compliance could be 11.5 billion Euros per annum. |

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| | <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Improvements to process, faster adoption, better coherence, standardisation, facilitate compliance for firms. • Better MSA coordination creates more level playing field. • Measures position manufacturers as 'high-quality / green' producers in global markets. <p>Costs:</p> <ul style="list-style-type: none"> • Two measures imply high costs increase according to industry associations: the collection of data regarding regulated products sales and usage and the provisions related to third party certification • More specifically, costs would be driven by data management IT systems to be put in place and a need to increase staffing to keep the data up-to-date and run the system. Third party certification would imply outsourcing costs of tasks, which are currently performed in-house (as well as managing the contacts with third parties). | <ul style="list-style-type: none"> • Better trained staff at MSA and national authorities, and clearer understanding of performance (benchmarked) • Support from EC on application of Ecodesign legislation and market surveillance • Support with product testing <p>Indirect benefits:</p> <ul style="list-style-type: none"> • In the case of centralised EC-level testing, possible MS level cost-savings • Common training, task sharing, 3rd party support to MSA, could all improve compliance, potentially save costs <p>Costs: Strengthening of enforcement through market surveillance and customs controls requires 210 FTEs of staff in the EU 27, with an administrative costs of around EUR 10.5 million per annum</p> | <ul style="list-style-type: none"> • Reduced GHG emissions of around 22 Mt CO₂e, with a monetary value of around EUR 2.2 billion per annum.” <p>Indirect benefits:</p> <ul style="list-style-type: none"> • Improved market surveillance reduces 'bad' products on market, increases benefits to consumers |
|--|--|---|--|

Note: Qualitative information on benefits is collected from literature review, desk research and interviews with industry associations and Member State representatives.

The identification of cost drivers and required number of additional FTE for businesses and administrations have been performed through consultations and surveys of industry associations and member state representatives.

Annex 4: Analytical methods

Due to the breadth of the Sustainable Product Initiative, the Impact Assessment is not based on a uniform methodology but a variety of qualitative and quantitative approaches. Most Policy Options likely induce a multitude of effects on businesses, consumers and public bodies, which cannot be fully quantified at the EU level. The assumptions and methods used for the assessment of these impacts are described in the respective sections in Annex 10.

Overall assessment of proportionality

The analysis was designed to be proportionate to the impacts that will result (economic, environmental and social) and the nature of the proposal. In relation to the second issue, the SPI whilst a legal proposal does not lead to binding requirements for different product groups. Instead, these binding requirements will follow after a deepening of the analysis (in line with the Commission's Better Regulation Guidelines and applying the methodology set out in Annex 16). As such, this analysis is considered proportionate for this stage in the process, and includes a commitment to deepen it for the SPI measures through more detailed impact assessment work.

The methodological framework including data triangulation

This section outlines the methodological framework for the determination of the economic, environmental and social characteristics of the product groups to be covered by the SPI. This framework is also used to quantitatively estimate the environmental impacts of Policy Option 2, which consists of an extension of the product scope of the Ecodesign legislation and thus derives its environmental improvement potential from an increased coverage of products and their respective environmental characteristics. This framework needs to be based on a coherent assessment methodology covering all relevant environmental indicators, which allows for comparability between different sub-options. In principle, two different methodological approaches are available for this purpose. On the one hand, impacts can be determined in detailed analyses (of individual products, processes, policy measures etc.) and subsequently aggregated to a more general level. This corresponds to a so-called "bottom-up" approach, which is characterised by high accuracy, but remains partially incomplete due to the high data requirements when a multitude of products and measures is to be covered and the results are to be applied to larger systems. On the other hand, a so-called "top-down" approach can be used, which starts from a larger system and assumes general relationships between the system components. This approach often has lower accuracy due to its aggregate nature, but can be considered complete and its individual results are comparable because they are based on a systems perspective (Rivers and Jaccard 2006²¹; Wilson and Swisher 1993²²). These approaches are increasingly used in combination as so-called "hybrid" approaches in order to make use of the respective strengths for specific research questions (cf. Lutter et al. 2016²³; Sala et al. 2019²⁴).

For the estimation of the environmental impacts of Policy Option 2, a top-down approach is chosen based on Environmentally Extended Multi-Regional Input-Output (EE-MRIO) Analysis,

²¹ Rivers, N.; Jaccard, M. (2006): Useful models for simulating policies to induce technological change. In *Energy Policy* 34 (15), pp. 2038–2047.

²² Wilson, D.; Swisher, J. (1993): Exploring the gap: top-down versus bottom-up analyses of the cost of mitigating global warming. In *Energy Policy* 21 (3), pp. 249–263.

²³ Lutter, S.; Pfister, S.; Giljum, S.; Wieland, H.; Mutel, C. (2016): Spatially explicit assessment of water embodied in European trade. A product-level multi-regional input-output analysis. In *Global Environmental Change* 38, pp. 171–182.

²⁴ Sala, S.; Benini, L.; Beylot, A.; Castellani, V.; Cerutti, A.; Corrado, S. et al. (2019): Consumption and consumer footprint. Methodology and results : indicators and assessment of the environmental impact of European consumption. Luxembourg: Publications Office of the European Union (JRC technical reports).

which is complemented by select bottom-up information. EE-MRIO tables provide information on the interconnection between economic sectors and the products they produce, the environmental and social effects associated with that production and final demand in a given geographical region. They are based on a comprehensive theoretical and empirical framework, which ensures compatibility with established systems of national economic and environmental accounting (Tukker et al. 2006²⁵; Schaffartzik et al. 2014²⁶). Among the available EE-MRIO databases, EXIOBASE (cf. Stadler et al. 2018²⁷) is especially well suited for the analysis of environmental, economic and – to some degree – social impacts due to its comparatively high sectoral resolution and detailed environmental extensions. The current version of EXIOBASE (v.3.8.1)²⁸ is based on detailed economic and environmental accounts at an aggregation level of 200 products (from 163 industries), 44 countries and 5 world regions. The environmental extensions cover over 400 categories of emissions, 20 categories of land use, over 200 categories of raw material extraction and energy use, and over 100 categories of water consumption. The original EXIOBASE 3 data series ends in 2011, but newer EE-MRIO tables have been estimated with the help of mainly macroeconomic and trade data. The end years of real data points of the environmental extensions are: 2015 energy, 2019 all GHGs (non-fuel, non-CO₂ are nowcasted from 2018), 2013 raw materials, 2011 most others, including land and water. Based on these end years, it was decided to use the 2015 product by product version of the data series, since it contains enough new data points to reflect structural change but does not rely too heavily on extrapolations. EE-MRIO databases generally have time lags because they require compilation from various sources and subsequent extensive harmonisation.

The EE-MRIO-based methodology can thus be used in a first instance to characterise different product groups with respect to their environmental, economic and – to some degree – social dimensions. In addition to the environmental dimension, the economic dimension can be expressed through various indicators, such as final demand, gross output and trade. The social dimension is so far only portrayed in EXIOBASE through employment, which is differentiated by gender and three different skill levels, as well as vulnerable employment.²⁹ The potential environmental impacts of Policy Option 2 are closely related to the environmental characteristics of the products that are covered by it. As will be seen further below, the information of the environmental characteristics of products can thus be directly used to determine the potential environmental impacts of Policy Option 2. This is not the case for economic and social impacts since they do not necessarily relate to the economic or social characteristics of the respective product groups.

²⁵ Tukker, A.; Huppes, G.; Guinée, J.B.; Heijungs, R.; Koning, A.; Oers, L. et al. (2006): Environmental Impacts of Products (EIPRO). Analysis of the life cycle environmental impacts related to the final consumption of the EU-25. European Commission, Joint Research Centre, Institute for Prospective Technological Studies and European Science and Technology Observatory (Technical Report Series, EUR 22284 EN). Available online at http://ec.europa.eu/environment/ipp/pdf/eipro_report.pdf.

²⁶ Schaffartzik, A.; Eisenmenger, N.; Krausmann, F.; Weisz, H. (2014): Consumption-based Material Flow Accounting. In *Journal of Industrial Ecology* 18 (1), pp. 102–112.

²⁷ Stadler, K.; Wood, R.; Bulavskaya, T.; Södersten, C.-J.; Simas, M.; Schmidt, S. et al. (2018): EXIOBASE 3. Developing a Time Series of Detailed Environmentally Extended Multi-Regional Input-Output Tables. In *Journal of Industrial Ecology* 45 (3), p. 539.

²⁸ See <https://zenodo.org/record/4588235#.YKovTJAzZqM> for more information.

²⁹ According to the definition of the ILO (International Labor Organization): 2013a. Guide to the new Millennium Development Goals Employment indicators: Including the full decent work indicator set. www.ilo.org/wcmsp5/groups/public/—ed_emp/documents/publication/wcms_11051

Table 14 Environmental impact categories of BR Toolbox #64 and correspondence with indicators in EXIOBASE; GWP¹⁰⁰ based on Intergovernmental Panel on Climate Change (IPCC) AR 5³⁰

| Impact category | Indicator | |
|---|------------------------|--|
| Climate change | Greenhouse gas (GHG) | Global warming potential (GWP ₁₀₀) |
| | CO ₂ | 1 |
| | CH ₄ | 28 |
| | N ₂ O | 265 |
| | NO _x | 1 (AR 5 does not provide single estimate) |
| | SO _x | 1 (AR 5 does not provide single estimate) |
| | SF ₆ | 23500 |
| | HFCs | 10740 |
| | PFCs | 8748 |
| Ozone depletion | - | |
| Human toxicity, cancer effects | As | |
| | Cd | |
| | Cr | |
| | Ni | |
| | PCB | |
| | PAH | |
| | Benzo(a)pyrene | |
| | Benzo(b)fluoranthene | |
| | Benzo(k)fluoranthene | |
| | Indeno(1,2,3-cd)pyrene | |
| Human toxicity, non-cancer effects | HCB | |
| | PCDD/F | |
| | Hg | |
| | Pb | |
| Particulate matter/Respiratory inorganics | TSP | |
| | PM ₁₀ | |
| | PM _{2.5} | |
| Ionising radiation, human health | - | |
| Ionising radiation, ecosystems | - | |
| Photochemical ozone formation | CO | |
| | NO _x | |
| | NM VOC | |
| Acidification | CO ₂ | |
| | CH ₄ | |
| | NO _x | |
| | SO _x | |
| | NH ₃ | |
| Eutrophication, terrestrial | N | |
| | NO _x | |
| | NH ₃ | |
| | P | |
| | P _{xx} | |
| Eutrophication, aquatic | N | |

³⁰ https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf; weighted factors for HFCs and PFCs calculated based on <https://www.epa.gov/ghgreporting/fluorinated-greenhouse-gas-emissions-and-supplies-reported-ghgrp#production>

| Impact category | Indicator |
|--|--|
| | P |
| | NH3 |
| | NO2 |
| Ecotoxicity (freshwater/terrestrial and marine) | As |
| | Cd |
| | Cr |
| | Ni |
| | PCB |
| | PAH |
| | Benzo(a)pyrene |
| | Benzo(b)fluoranthene |
| | Benzo(k)fluoranthene |
| | Indeno(1,2,3-cd)pyrene |
| | HCB |
| | PCDD/F |
| | Cu |
| | Hg |
| | Pb |
| | Zn |
| Se | |
| Land use | Arable land (9 categories) |
| | Permanent pasture |
| | Used forest land |
| | Used other land |
| | Infrastructure land |
| Resource depletion, water | Water consumption green (13 categories) |
| | Water consumption blue (103 categories) |
| | Water withdrawal blue (78 categories) |
| Resource depletion, mineral, fossil and renewable | Domestic extraction used, biomass, metallic/non-metallic minerals, fossil (227 categories) |
| | Unused domestic extraction, biomass, metallic/non-metallic minerals, fossil (223 categories) |

The environmental impacts of the Policy Options are calculated using a demand-based perspective, which allocates environmental impacts of a production-consumption system to the different final demand categories per product (i.e. household consumption, government consumption and investment), based on their demand for inputs from preceding production processes, which are accompanied by environmental pressures (Tukker et al. 2006). This approach is thus able to portray the full environmental impacts along the supply chains of products that are finally placed on the EU market in the form of consumption or investment goods and which do not undergo further transformation in production processes (in which value is added).

However, the approach does not allocate environmental impacts during the use phase and after (e.g. for disposal) to the respective products. Instead, use phase impacts, consisting predominantly of energy consumption of relevant products, are accounted for as final demand for energy by households or intermediate demand for energy by firms. Likewise, disposal and recycling of products is accounted for in the form of final or intermediate demand for corresponding services. The energy consumption during the use phase is thus manually re-allocated from final demand of households and firms to the energy-using product groups *computer, electronic and optical products* (no. 26 in the CPA 2.1 classification), *electrical equipment* (27) and *machinery and equipment* (28) based on household energy consumption

statistics from Eurostat³¹ and the results from the Ecodesign Impact Accounting (EIA) Status Report 2019.³² For households, 87% of the environmental impacts of their demand for *electricity, gas, steam and air conditioning* (35 in the CPA 2.1 classification) are thus re-allocated by a share of 98.5% to *electrical equipment* (mainly consisting of household appliances and heating equipment) and by a share of 1.5% to *machinery and equipment* (mainly consisting of other appliances that are less widely used in households). The energy consumption of the energy-using products employed by firms is accounted for as intermediate energy demand of the respective industries (and not of the products themselves). In order to re-allocate energy consumption and the corresponding environmental impacts, the total amount of energy used by the above three product groups is first extracted from the EIA Status Report 2019 and the already re-allocated household energy consumption is subtracted from this value (with approx. 30,000 PJ remaining). Subsequently, scaling factors for the other environmental impact categories according to their distribution of environmental impacts of the *electricity, gas, steam and air conditioning* product group are calculated. The energy consumption of the energy-using product groups together with the scaling factors are then used to subtract energy consumption and related environmental impacts from all other product groups (since energy use in the supply chain is allocated to them through the demand-perspective calculations outlined above). This energy consumption is then re-allocated to the above three energy-using product categories with the following shares, which are also taken from the EIA Status Report 2019: 20% for *computer, electronic and optical products*, 9% for *electrical equipment* and 71% for *machinery and equipment*. Due to a lack of adequate data, this re-allocation is not performed for product-related environmental impacts beyond the use phase.

The above calculations thus yield the life cycle environmental impacts of all product groups up to and including their use phase. Product groups with higher environmental impacts theoretically also contain a higher potential for impact reductions. The IA approach is thus based on the product scope as the main lever of potential impact reductions. In addition to these potentials based on the product scope, the level of sustainability of the products on the EU market (from a production perspective) and the level of sustainability of the use and end-of-life treatment of these products determine their overall environmental impacts. The latter two factors are influenced by the level of ambition and the supposed effectiveness of the various measures within Policy Options 3 to 6. A simple illustration of the approach is provided in Figure 1.

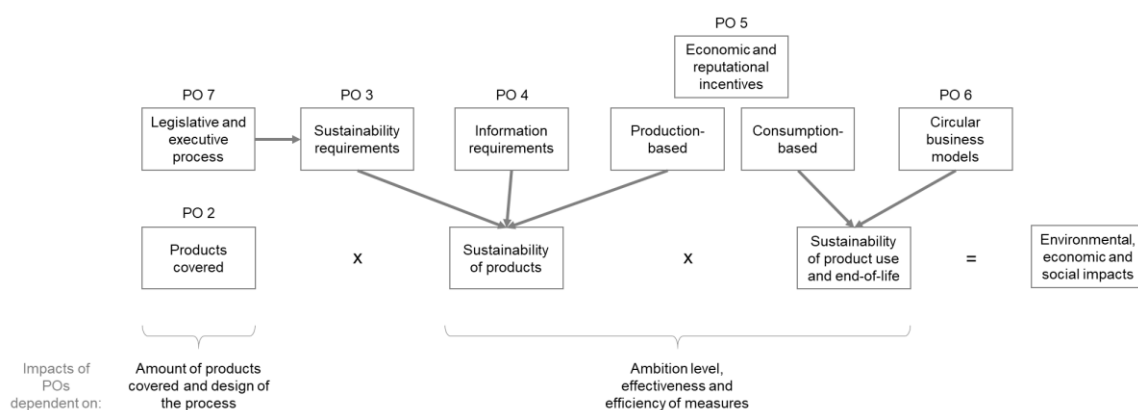


Figure 1 Schematic illustration of the modelling approach

While the potential impacts based on the product scope can be quantitatively determined according to the aforementioned logic, the Policy Options do not contain explicit ambition levels,

³¹ https://ec.europa.eu/eurostat/statistics-explained/images/f/f2/Energy_consumption_households_data2018_.xlsx

³² Ecodesign Impact Accounting Status Report 2019 (<https://www.vhk.nl/downloads/Reports/EIA/EIA%20Status%20Report%202019%20-%20VHK20201028.pdf>)

and the effectiveness of the measures can only be based on isolated evidence. We use a single metric to represent ambition levels and effectiveness of the measures based on best-case scenarios in the literature, which for simplicity, we call improvement potentials. Such broad improvement potentials have so far mainly been quantified for selected impact categories and in selected areas, while only a small number of meta studies provide – albeit qualitative – overviews on improvement potentials across several areas (e.g. Böckin et al. 2020³³). In addition, different methods are used with different levels of scientific robustness. Due to the complexity of the mechanisms involved and the effects triggered by improvement measures, a mix of methods is often used that combines (partly qualitative) estimates of technical potentials with socio-economic diffusion scenarios and quantitative assessment methods (cf. Le Den et al. 2020³⁴). These scenarios are generally not linked to policy options but rather assume that the technical potentials are realised at some point, regardless of the means by which they are realised. The studies are often summarised as circular economy actions, though they often also include product improvements related to, e.g., more efficient production processes or sustainable input materials, without being “circular” in the strictest sense. Studies with this orientation therefore appear suitable for a general quantification of the environmental improvement potentials within the Policy Options. However, most of these studies focus mainly on the GHG reduction potential of circular economy actions. The improvement potential of the other environmental impact categories are for simplicity assumed to be proportional to the GHG reduction potential. The GHG reduction potentials found in the literature are summarised in **Error! Reference source not found.**

Table 15 Maximum improvement potentials for select relevant product groups found in the literature

| Generic product category | Product group in CPA 2.1 classification | GHG reduction potential | Source |
|-------------------------------------|---|--------------------------------|--|
| Communication | 26 - Computer, electronic and optical products 61 – Telecommunications services | 6% | Circle Economy (2021) ³⁵ |
| Electrical and electronic equipment | 26 - Computer, electronic and optical products 27 - Electrical equipment | 50% | Deloitte (2016) ³⁶ |
| Construction and buildings | 41 - Buildings and building construction works 42 - Constructions and construction | 32-76% | Deloitte (2016); Circle Economy (2021); Material |

³³ Böckin, D.; Willskytt, S.; André, H.; Tillman, A.; Ljunggren Söderman, M. (2020): How product characteristics can guide measures for resource efficiency — A synthesis of assessment studies. In Resources, Conservation and Recycling 154, p. 104582.

³⁴ Le Den, X.; Porteron, S.; Collin, C.; Horup Sorensen, L. H.; Herbst, A.; Rehfeldt, M. et al. (2020): Quantification methodology for, and analysis of, the decarbonisation benefits of circular economy actions. Final Report. European Environment Agency. Available online at <https://ramboll.com/-/media/files/rm/rapporteur/methodology-and-analysis-of-decarbonization-benefits-of-sectoral-circular-economy-actions-17032020-f.pdf?la=en>.

³⁵ Circle Economy (2021): The Circularity Gap Report 2021. Available online at <https://drive.google.com/file/d/1MP7EhRU-N8n1S3zpzqlshNWxqFR2hznd/edit>.

³⁶ Deloitte (2016): Circular economy potential for climate change mitigation. Available online at <https://www2.deloitte.com/content/dam/Deloitte/fi/Documents/risk/Deloitte%20-%20Circular%20economy%20and%20Global%20Warming.pdf>.

| Generic product category | Product group in CPA 2.1 classification | GHG reduction potential | Source |
|--------------------------|---|-------------------------|--------------------------------|
| | works for civil engineering 43 - Specialised construction works | | Economics (2018) ³⁷ |
| Consumables | 13 - Textiles 14 - Wearing apparel 15 - Leather and related products 17 - Paper and paper products 20 - Chemicals and chemical products 22 - Rubber and plastic products 26 - Computer, electronic and optical products 27 - Electrical equipment 31 - Furniture 32 - Other manufactured goods | 32% | Circle Economy (2021) |

Due to the high degree of uncertainty involved in the quantification, it is advisable to consider a range of possible impacts instead of single values. The values represent the maximum potential in each study for a limited number of product groups. Some of the generic product categories display overlaps in the assigned product groups within the respective studies; e.g. *computer, electronic and optical products* (26) is assigned to *communication, electrical and electronic equipment* and *consumables* by the respective studies. In order to represent the global maximum applicable for the SPI, the higher value is used for the respective product groups in these cases. Additional generic values have to be assumed for the product groups not listed in the above Table to determine an overall plausible range of improvement potentials. For the remaining product groups, 20% is assumed, which appears to be a realistic improvement potential across a wide set of product groups. Based on these considerations, the improvement potential is therefore likely to lie somewhere in between zero (if the measures show no effect) and the maximum values outlined above. The final improvement potentials per product group applied in the Impact Assessment are summarised in Table below. The overall environmental impacts of Policy Option 2 are then the product of the share of environmental impacts covered by the respective product coverage and the respective environmental improvement potential. (See Annex 12 for additional discussion, as this feeds into the potential environmental and economic benefits of SPI.)

Table 16 Maximum improvement potentials applied in the Impact Assessment

| CP A 2.1 Code | Description | Improvement potential |
|---------------|--|-----------------------|
| 1 | Products of agriculture, hunting and related services | 0.2 |
| 2 | Products of forestry, logging and related services | 0.2 |
| 3 | Fish and other fishing products; aquaculture products; support services to fishing | 0.2 |

³⁷ Material Economics (2018): The Circular Economy - a Powerful Force for Climate Mitigation. Available online at https://materialeconomics.com/material-economics-the-circular-economy.pdf?cms_fileid=340952bea9e68d9013461c92fbc23cae.

| | | |
|----|---|------|
| 5 | Coal and lignite | 0.2 |
| 6 | Crude petroleum and natural gas | 0.2 |
| 7 | Metal ores | 0.2 |
| 8 | Other mining and quarrying products | 0.2 |
| 9 | Mining support services | 0.2 |
| 10 | Food products | 0.2 |
| 11 | Beverages | 0.2 |
| 12 | Tobacco products | 0.2 |
| 13 | Textiles | 0.32 |
| 14 | Wearing apparel | 0.32 |
| 15 | Leather and related products | 0.32 |
| 16 | Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials | 0.2 |
| 17 | Paper and paper products | 0.32 |
| 18 | Printing and reproduction services of recorded media | 0.2 |
| 19 | Coke and refined petroleum products | 0.2 |
| 20 | Chemicals and chemical products | 0.32 |
| 21 | Basic pharmaceutical products and pharmaceutical preparations | 0.2 |
| 22 | Rubber and plastic products | 0.32 |
| 23 | Other non-metallic mineral products | 0.2 |
| 24 | Basic metals | 0.2 |
| 25 | Fabricated metal products, except machinery and equipment | 0.2 |
| 26 | Computer, electronic and optical products | 0.5 |
| 27 | Electrical equipment | 0.5 |
| 28 | Machinery and equipment n.e.c. | 0.2 |
| 29 | Motor vehicles, trailers and semi-trailers | 0.2 |
| 30 | Other transport equipment* | 0.2 |
| 31 | Furniture | 0.32 |
| 32 | Other manufactured goods | 0.32 |
| 33 | Repair and installation services of machinery and equipment | 0.2 |
| 35 | Electricity, gas, steam and air conditioning | 0.2 |
| 36 | Natural water; water treatment and supply services | 0.2 |
| 37 | Sewerage services; sewage sludge | 0.2 |
| 38 | Waste collection, treatment and disposal services; materials recovery services | 0.2 |
| 39 | Remediation services and other waste management services | 0.2 |
| 41 | Buildings and building construction works | 0.76 |
| 42 | Constructions and construction works for civil engineering | 0.76 |
| 43 | Specialised construction works | 0.76 |
| 45 | Wholesale and retail trade and repair services of motor vehicles and motorcycles | 0.2 |
| 46 | Wholesale trade services, except of motor vehicles and motorcycles | 0.2 |
| 47 | Retail trade services, except of motor vehicles and motorcycles | 0.2 |
| 49 | Land transport services and transport services via pipelines | 0.2 |
| 50 | Water transport services | 0.2 |
| 51 | Air transport services | 0.2 |

| | | |
|----|--|------|
| 52 | Warehousing and support services for transportation | 0.2 |
| 53 | Postal and courier services | 0.2 |
| 55 | Accommodation services | 0.2 |
| 56 | Food and beverage serving services | 0.2 |
| 58 | Publishing services | 0.2 |
| 59 | Motion picture, video and television programme production services, sound recording and music publishing | 0.2 |
| 60 | Programming and broadcasting services | 0.2 |
| 61 | Telecommunications services | 0.06 |
| 62 | Computer programming, consultancy and related services | 0.2 |
| 63 | Information services | 0.2 |
| 64 | Financial services, except insurance and pension funding | 0.2 |
| 65 | Insurance, reinsurance and pension funding services, except compulsory social security | 0.2 |
| 66 | Services auxiliary to financial services and insurance services | 0.2 |
| 68 | Real estate services | 0.2 |
| 69 | Legal and accounting services | 0.2 |
| 70 | Services of head offices; management consulting services | 0.2 |
| 71 | Architectural and engineering services; technical testing and analysis services | 0.2 |
| 72 | Scientific research and development services | 0.2 |
| 73 | Advertising and market research services | 0.2 |
| 74 | Other professional, scientific and technical services | 0.2 |
| 75 | Veterinary services | 0.2 |
| 77 | Rental and leasing services | 0.2 |
| 78 | Employment services | 0.2 |
| 79 | Travel agency, tour operator and other reservation services and related services | 0.2 |
| 80 | Security and investigation services | 0.2 |
| 81 | Services to buildings and landscape | 0.2 |
| 82 | Office administrative, office support and other business support services | 0.2 |
| 84 | Public administration and defence services; compulsory social security services | 0.2 |
| 85 | Education services | 0.2 |
| 86 | Human health services | 0.2 |
| 87 | Residential care services | 0.2 |
| 88 | Social work services without accommodation | 0.2 |
| 90 | Creative, arts and entertainment services | 0.2 |
| 91 | Library, archive, museum and other cultural services | 0.2 |
| 92 | Gambling and betting services | 0.2 |
| 93 | Sporting services and amusement and recreation services | 0.2 |
| 94 | Services furnished by membership organisations | 0.2 |
| 95 | Repair services of computers and personal and household goods | 0.2 |
| 96 | Other personal services | 0.2 |
| 97 | Services of households as employers of domestic personnel | 0.2 |
| 98 | Undifferentiated goods and services produced by private households for own use | 0.2 |
| 99 | Services provided by extraterritorial organisations and bodies | 0.2 |

In relation to the monetisation of greenhouse gas emissions, a cost of carbon is used³⁸. Figures underpinning the analysis are below, with the central value used (as most consistent with the climate commitments) and the 2030 value used of 100 EUR per tCO₂eq. This is clearly an approximation, and no variation is made to reflect the time profile of when emissions will occur.

Table 17 Values in current Euros per tCO₂eq.

| | Low | Central | High |
|------------|-----|---------|------|
| Up to 2030 | 60 | 100 | 189 |
| Post 2030 | 156 | 269 | 498 |

³⁸ [Handbook on the external costs of transport - Publications Office of the EU \(europa.eu\)](#)

Annex 5: Political Context

This initiative builds on several reports adopted by the European Commission as well as various commitments made.

The **European Green Deal**³⁹ is the growth strategy to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. It has set the ambitious objective of ensuring that the EU becomes the first climate neutral continent by 2050. To achieve this, it confirms that the full mobilisation of industry and citizens will be required. As things stand, production processes remain too ‘linear’: they are dependent on a throughput of new materials extracted, traded and processed into goods, and finally disposed of as waste or emissions, with only 12% of the materials used coming from recycling. Since the publication of the European Green Deal, the European Commission has acted to enshrine the EU’s climate goals in law, including via a legislative proposal⁴⁰ for the first European Climate Law – which includes a 2030 emissions reduction target of at least 55% as a stepping stone to the 2050 climate neutrality goal – as well as a series of the legislative proposals adopted in July 2021 to implement this new target (‘Fit for 55’ package)⁴¹. As set out in the Circular Economy Action Plan (see below), scaling up the circular economy from front-runners to mainstream economic players will make a decisive contribution to achieving these goals. This initiative should also be seen in this light.

The European Green Deal has also set energy efficiency as a priority for the decarbonisation of the energy sector and for reaching the climate objectives in 2030 and 2050⁴². This involves further addressing energy use and energy efficiency of energy-related products as ecodesign is currently doing, but also increasingly looking at the embedded energy (or ‘grey energy’), of products in general, i.e. the energy that has been used in the previous phases of their lifecycle.

The European Green Deal also announced the new industrial strategy for Europe and the Circular Economy Action Plan, published alongside one another in March 2020.

The **European Commission’s 2020 industrial strategy for Europe**⁴³ sets out the EU’s overarching ambition to foster a ‘twin transition’ to climate neutrality and digital leadership. It echoes the European Green Deal in pointing to the leading role that Europe’s industry must play in this, by reducing its carbon and material footprint and embedding circularity across the economy, and underlines the need to move away from traditional models, and revolutionize the way we design, make, use and dispose of products. In May 2021, in response to the COVID-19 crisis, the European Commission published an **update to the Industrial Strategy**⁴⁴, which reinforces the main messages of the 2020 Industrial Strategy by focusing on the ‘green transition’ as one of the central elements through which to monitor and examine each of the 14 industrial ecosystems it identifies, and by underlining the importance of making available low-carbon and sustainable products and technologies in order to support ecosystems’ decarbonisation pathways.

³⁹ COM(2019) 640 final

⁴⁰ **Error! Hyperlink reference not valid.** REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (‘European Climate Law’)

⁴¹ COM(2021) 550 final

⁴² The European Green Deal, COM(2019) 640 final

⁴³ COM(2020) 102 final

⁴⁴ COM(2021) 350 final

The **Circular Economy Action Plan**⁴⁵ (CEAP) aims, amongst other aspects, at stimulating the development of lead markets for climate neutral and sustainable **products**, in the EU and beyond. To achieve this, it establishes a ‘sustainable products’ policy framework’, including measures across three broad areas: fostering sustainable product design; empowering consumers and public buyers; and promoting circularity in production processes.

While the three areas of the sustainable products policy framework are synergetic with each other, the current impact assessment focuses primarily on the measures foreseen under the first (‘sustainable product design’), and in particular on the **sustainable product policy legislative initiative** announced by the CEAP in this context. As clarified in the text, this legislative initiative will aim to make products fit for a climate-neutral, resource-efficient and circular economy, reduce waste and ensure that the performance of front-runners in sustainability progressively becomes the norm. As also clarified, the core of this legislative initiative should be a widening of the **Ecodesign Directive** beyond energy-related products, in order to make it applicable to the broadest possible range of products and make it deliver on circularity⁴⁶.

Either as part of this legislative initiative or, where appropriate, through complementary instruments, the CEAP commits the European Commission to setting rules on:

- improving product durability, reusability, upgradability and reparability, addressing the presence of hazardous chemicals in products, and increasing their energy and resource efficiency;
- increasing recycled content in products, while ensuring their performance and safety;
- enabling remanufacturing and high-quality recycling;
- reducing carbon and environmental footprints;
- restricting single-use and countering premature obsolescence;
- introducing a ban on the destruction of unsold durable goods;
- incentivising product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its lifecycle;
- mobilising the potential of digitalisation of product information, including solutions such as digital passports, tagging and watermarks;
- rewarding products based on their different sustainability performance, including by linking high performance levels to incentives.

The policy options set out in the current impact assessment reflect various alternatives for fulfilling the above commitments, and in so doing respond to the **general objective** of reducing the negative life-cycle environmental and social impacts of products and improving the functioning of the internal market.

⁴⁵ COM(2020) 98 final

⁴⁶ It should also be noted that the new [EU Strategy on Adaptation to Climate Change](#) calls for improving water efficiency and reuse by raising the requirements for products subject to ecodesign and energy labelling.

This initiative also reflects key ambitions of the proposal for the **8th Environmental Action Plan (EAP)** adopted by the European Commission in October 2020⁴⁷. This programme is intended to guide European environmental policy until 2030. It reiterates the commitments made under the 7th EAP⁴⁸ (which included a commitment to turn the Union into a resource-efficient, green, and competitive low-carbon economy) and goes further, identifying a number of key priorities for the EU, including **‘advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy’**.

Before the publication of some of the above-mentioned documents, reflection within the European Commission on enhancing product sustainability had begun. The 2019 European Commission Staff Working Document **‘Sustainable Products in a Circular Economy - Towards an EU Product Policy Framework contributing to the Circular Economy’**⁴⁹, found that no overarching, integrated EU policy instrument exists that covers the sustainable production and consumption of all products and/or the availability and reliability of information on these products to consumers. Instead there is a patchwork of tools that, although capable of addressing certain aspects related to product circularity, nevertheless offers space for additional work to be done. The document noted that in certain highly relevant sectors (such as textiles and furniture), no tools to systematically target circularity were in place, and that the success of Ecodesign policies in stimulating circularity for energy-related products has yet to be applied in other relevant sectors.

In addition to the European Commission’s work, both the Council and European Parliament have called for action on policies that support the transition to a circular economy and ensure products placed in the EU market are sustainable (see separate section below).

The European Green Deal also calls for the EU to better monitor, report, prevent and remedy air, water, soil and consumer products pollution. This is translated by the **EU Action Plan “Towards zero pollution for air, water and soil”**⁵⁰ and the **Chemicals Strategy for Sustainability**⁵¹ call for embracing the zero pollution goals in production and consumption which means that chemicals, materials and products have to be as safe and sustainable as possible by design and during their life cycle, leading to non-toxic material cycles. The Sustainable Product Initiative will play a crucial role in delivering this ambition. In particular, it will facilitate making zero pollution choices which is one of the flagship initiatives of the Action Plan. *“From 2022 onwards, the Commission will encourage public and private sector operators to make ‘zero pollution pledges’ to promote best available, ‘near-zero waste’ options, and in general products and services proven to be less polluting over their whole life cycle, with a focus on EU Ecolabel products and services, including tourist accommodations and less toxic chemicals and materials. This will provide people with more offers and information on cleaner options.”* Moreover, it will help reduce the EU global pollution footprint and benefit third-country citizens’ health and environment *“by promoting global zero pollution in all relevant international fora and work with the EU Member States and stakeholders to significantly reduce the EU’s external pollution footprint”* and *“by proposing, in line with EU international commitments, to restrict the export of certain products which are no longer allowed in the EU market, and wastes that have harmful environmental impacts in third countries”*.

The Chemicals Strategy for Sustainability calls for minimisation of the presence of substances of concern in products by introducing requirements as part of this Sustainable Product Policy Initiative, and to ensure availability of information on chemical content and safe use, by introducing information

⁴⁷ The 8th EAP is expected to be adopted in 2021, https://ec.europa.eu/environment/strategy/environment-action-programme-2030_en

⁴⁸ <https://ec.europa.eu/environment/action-programme/#:~:text=The%207th%20Environment%20Action%20Programme%20%28EAP%29%20will%20be,we%20live%20well%2C%20within%20the%20planet%E2%80%99s%20ecological%20limits.>

⁴⁹ SWD(2019) 92 final

⁵⁰ COM(2021) 400 final

⁵¹ COM(2021) 667

requirements and tracking the presence of substances of concern through the life cycle of materials and products. This SPI will be crucial to deliver on this commitment.

This ties in with wider ambitions at international level, where the EU has also committed to implementation of the **UN 2030 Agenda for Sustainable Development**, including its 17 Sustainable Development Goals (SDGs). A 2021 report⁵² found that the EU has recently achieved moderate progress towards **SDG 12**, ‘*Ensure sustainable consumption and production patterns*’ (even if the trends do not yet reflect the impacts of the COVID-19 pandemic and have shown a mixed picture in the period up to 2019). On the positive side, there has been a slight decrease in consumption of toxic chemicals since 2014; the gross value added of the environmental goods and services sector (EGSS) has risen considerably; and some decoupling of environmental impacts from economic growth has taken place (see also Annex 7). However, absolute decoupling has not been achieved for energy or material use; waste generation has been increasing; and average CO₂ emissions from new cars are not falling fast enough to meet targets – all suggesting much work remains to be done.

The SPI has the potential to contribute to the achievement of the following SDG targets:

- 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment;
- 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse;
- 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle;
- 12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities;
- 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

Finally, it should be noted that the EU is Party to the Aarhus Convention⁵³. This Convention, together with its Protocol on Pollutant Release and Transfer Registers, is legally binding on its Parties and aims to protect every person’s right to live in an environment adequate to his or her health and well-being. Amongst its provisions, it imposes on Parties specific obligations to ensure access to environmental information. In particular its Article 5 (paragraphs 6, 8 and 9) makes explicit the obligation for Parties to encourage operators to inform the public regularly of the environmental impact of their activities and products, to develop mechanisms to ensure sufficient product information is made available to the public in a manner which enables informed environmental choices, and to take steps to progressively establish systems of pollution inventories/registers – including information on e.g. water, energy and resource use – in a structured, computerized and publicly accessible database compiled through standardized reporting.

⁵² [Monitoring report on progress towards the SDGs in an EU context, 2021 edition, https://ec.europa.eu/eurostat/documents/3217494/12878705/KS-03-21-096-EN-N.pdf/8f9812e6-1aaa-7823-928f-03d8dd74df4f?t=1623741433852](https://ec.europa.eu/eurostat/documents/3217494/12878705/KS-03-21-096-EN-N.pdf/8f9812e6-1aaa-7823-928f-03d8dd74df4f?t=1623741433852)

⁵³ <https://unece.org/environment-policy/public-participation/aarhus-convention/introduction>

The CEAP emphasises that the EU cannot deliver alone the ambition of the European Green Deal for a climate-neutral, resource-efficient and circular economy. Therefore, SPI will contribute to EU efforts to lead the way to a circular economy at the global level⁵⁴.

SPI role in meeting EU environmental objectives, including climate targets

While efforts at EU level to meet our ambitious climate targets have a justifiably strong focus on reduction of net **greenhouse gas emissions** – e.g. via the recently adopted **Fit for 55 package**⁵⁵ – the European Green Deal recognised from the outset that an even more holistic step-change will be needed: that replacing the ‘take-make-use-dispose’ economic model with a circular economy model, in particular when it comes to **products**, will be indispensable. It has been estimated that half of total greenhouse gas emissions, and more than 90% of biodiversity loss and water stress, are coming from resource extraction and processing⁵⁶ – activities closely related to product production; another study has estimated that producing the products we use every day is contributing 45% to our total current emissions⁵⁷.

In this context, SPI should be seen as a **key flanking instrument for achieving EU climate goals**: it will synergize with and complement instruments with more direct climate focus by going beyond the production of basic materials/basic material components to cover **final products themselves** (which are outside the scope e.g. of the Fit for 55 measures). This will allow for taking action on negative impacts generated along the entire value chain of a product – not only e.g. direct emissions from products themselves, such as those generated during the use phase, but also less direct impacts, such as the embedded emissions of a product throughout its lifecycle, or other negative consequences (e.g. on resource depletion; land use; ozone depletion etc.). This will directly support Green Deal objectives.

For energy-related products alone, a recent report⁵⁸ argues that if the next Ecodesign Working Plan were to be more ambitious, without taking account of the human resources needed to achieve this, it could achieve another 58 Mt CO_{2eq}/year of emission cuts by 2030 (which is almost 4% of the total efforts needed to achieve the EU’s 2030 reduction goal), **a further 30 Mt⁵⁹ of indirect emission savings could be achieved through resource efficiency provisions** - such as increasing the durability of products, as foreseen under SPI.

By way of illustration: together, throughout their lifetime, the priority products listed under sub-option 2a are estimated to cover an additional 14% of GHG emissions, 38% of human toxicity impacts and 15% of primary energy consumption compared to the baseline (see Annex 10 for more information). If SPI were to be extended to at least these products, including the baseline it would have the total potential to cover 63 % of GHG emissions, 66 % of primary energy use and 60 % of human toxicity impacts resulting from European consumption.

SPI is complementary to the set of measures to fight climate change adopted in the Fit for 55 package in July 2021. Those measures (especially ETS and Carbon Border Adjustment Mechanism) target the production of basic materials and basic material components, excluding final products. This measure, on the contrary, addresses carbon emissions taking place along the entire values chain of final products. Addressing also those emissions will directly contribute to the Green Deal objectives (by

⁵⁴ In line with the Commission Staff Working Document “Leading the way to a global circular economy: state of play and outlook”. SWD(2020) 100

⁵⁵ https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541

⁵⁶ Circular Economy Action Plan

⁵⁷ Completing the picture: How the Circular Economy tackles Climate Change, Ellen Macarthur Foundation, 2019, <https://ellenmacarthurfoundation.org/completing-the-picture>; This study included food products in its estimations.

⁵⁸ https://ecostandard.org/wp-content/uploads/2021/09/EEB_ECOS-Delays-in-ecodesign-report.pdf

⁵⁹ This is based on the ‘Preparatory study for the Ecodesign and Energy Labelling Working Plan 2020-2024’ which gives a range of 8-46 Mt CO₂ savings in the production phase from durability improvements in energy related products.

applying to final products, currently not in scope of Fit for 55 measures) but will also contribute to the global reduction of climate change impacts, by fostering the environmental optimisation of value chain management through footprint reduction.

POSITION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

European Parliament report on the New Circular Economy Action Plan, February 2021

The European Parliament adopted on 16th February 2021 its **report on the New Circular Economy Action Plan**⁶⁰ by 574 votes (22 against, and 95 abstentions).

The report endorses the agenda presented by the European Commission in the Circular Economy Action Plan. It considers the transition to a circular economy as the option to address the current environmental challenges and the economic crisis brought by the COVID-19 pandemic.

As regards the CEAP flagship initiatives, they:

- welcome broadening the scope of the Ecodesign Directive, establishing sustainability principles and product requirements to address notably durability, reparability, recycled content, reduction of product and environmental footprint, and support the Digital Product Passport.
- call for strengthening the EU Ecolabel and ensuring synergies with the Sustainable Product Initiative.
- strongly support the regulation of green claims ‘through the establishment of solid and harmonised calculation methods’. They also strongly welcome the planned initiatives to establish a new ‘right to repair’, which should cover at least the extended life cycle of products, access to spare parts and to comprehensive information and to affordable repair services for consumers.

The European Parliament agrees with the key product value chains identified in the action plan. For each of them, the report highlights the most important aspects, which are mostly aligned to those initiatives included in the action plan.

The Parliament places particular emphasis on certain aspects, in some cases going beyond the commitments of the CEAP:

- Targets in the context of the Sustainable Products Initiative: the report asks the European Commission to propose binding material and environmental footprint targets for the whole product lifecycle for each product category placed in the EU market [...] and to propose product-specific binding targets for recycled content [...]

European Parliament report ‘Towards a more sustainable single market for business and consumers’, November 2020

In November 2020, the Parliament adopted its report **Towards a more sustainable single market for businesses and consumers**⁶¹. This report stressed that a well-functioning single market is a powerful tool for the EU’s green and digital transitions. It called on the European Commission to show strong

⁶⁰ (2020/2077(INI)), https://www.europarl.europa.eu/doceo/document/A-9-2021-0008_EN.html

⁶¹ (2020/2021(INI)), https://www.europarl.europa.eu/doceo/document/TA-9-2020-0318_EN.html

political ambition in upcoming proposals, such as the sustainable product policy initiative, and in this context, stressed that sustainable consumption goes hand in hand with sustainable production and that economic operators should be encouraged to consider the durability of products and services from the design stage. The report sets out a comprehensive set of action points across six sections: 1. Consumer rights and clamping down on planned obsolescence; 2. Facilitating repairs; 3. Global strategy to promote a culture of reuse; 4. A digital strategy for a sustainable market; 5. Changes in approach required from public authorities; and 6. Responsible marketing and advertising.

Amongst other aspects, the report:

- called on the European Commission to explore measures differentiating between categories of products that will improve products' durability, including their estimated lifespan, reusability, upgradability, reparability and recyclability;
- called on the European Commission to tackle planned obsolescence and provide consumers with clear and non-confusing information on the estimated lifespan and reparability of a product, possibly through the introduction of mandatory labelling informing on durability and reparability, such as a repair score;
- called for information on the availability of spare parts, software updates and the reparability of a product to be made available in a clear and easily legible manner at the time of purchase;
- welcomed the European Commission's consideration of binding measures to prevent the destruction of unsold goods;
- stressed the importance of boosting circular economy and sustainable business models to minimise the destruction of goods and promote repair and reuse;
- welcomed the ambition of the European Commission to develop a digital 'product passport' to improve traceability and access to information on the conditions of production of a product, durability, composition, reuse, repair, dismantling possibilities and end-of-life handling, taking into account the proportionality principle and paying special attention to the needs of SMEs, micro-enterprises and the self-employed;
- called on the European Commission to be ambitious in making sustainable criteria in public procurement the default choice.

European Parliament resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC)

In May 2018, the Parliament adopted its resolution **on the implementation of the Ecodesign Directive (2009/125/EC)** by 561 votes (45 against, and 17 abstentions). The resolution acknowledges the Directive as an effective tool to deliver cost-effective savings, welcoming the recent additions on material efficiency while calling for an improvement of market surveillance and reinforcement of the decision making process.

In particular the Parliament, among other things:

- Recommended that the European Commission continue to include more product groups selected on the basis of their Ecodesign potential, including both energy efficiency and material efficiency potential as well as other environmental aspects, using the methodology set out in Article 15 of the directive, and that it keep existing standards up to date, in order to reap the full potential of the directive's scope and objectives;

- Expressed significant concern in the delay of development and adoption of implementing measures, noted that the implementation delays are due in part to the limited resources available within the European Commission and called for the deployment of sufficient resources;
- Considered that the Ecodesign Directive provides significant potential for improving resource efficiency that is still untapped, and that the choice of circular economy criteria for each product group must be well specified and defined in a clear and objective manner, while being easily measurable and achievable at a proportionate cost, in order to ensure that the directive remains implementable;
- Welcomed the commitment to develop requirements and standards for material efficiency, supporting the use of secondary raw materials, and urges the European Commission to complete this work as a matter of priority; considers that such criteria should be product-specific, based on robust analyses, focus on areas with clear improvement potential and be enforceable and verifiable by market surveillance authorities;
- Insisted on the need to strengthen the surveillance of products placed on the internal market through better cooperation and coordination between Member States and between the European Commission and national authorities and through the provision of adequate financial resources to the market surveillance authorities
- Called for a more coherent and cost-effective market surveillance system across the Union to ensure compliance with the Ecodesign Directive

European Parliament resolution of 10 July 2020 on the Chemicals Strategy for Sustainability

In 2020, the European Parliament, in its resolution on the Chemicals Strategy, re-iterated that the issue of products containing legacy substances of concern should be dealt with by means of an efficient tracking and disposal system.

Council conclusions on Making the Recovery Circular and Green, December 2020

The Council (ENV) adopted detailed conclusions⁶² on 17th December 2020 endorse the agenda on the circular economy. It highlights some important aspects, in particular:

- instrumental role of the Circular Economy in the economic recovery and a call for including circular economy in the recovery and resilience plans;
- support the focus on sustainable product policy and to expanding the scope of the Ecodesign Directive, as well as the right of repair at reasonable costs, and call for a proposal on digital passport and standards for a dataspace;
- acknowledgement of the role of the environmental footprint methods in the context of the upcoming initiative on green claims and revision of product policy; support to mandatory green public procurement in sectoral legislation;

⁶² https://www.consilium.europa.eu/media/47583/st_13852_2020_init_en-1.pdf

- endorsement of the 7 key product value chains identified in the action plan;
- support for the plan to present a Circular Electronics Initiative to prolong the life of electric and electronic devices through Ecodesign and facilitating upgrading and repairs activities;
- general call to advance on European Commission’s efforts to foster the uptake of recycled content in products, of verification methods, and development of secondary raw materials;
- support to stakeholders engagement on circular economy;

Particular emphasis on certain aspects, which the European Commission should take into account in developing legislative proposals and actions:

- account the different starting points and specificities of Member States, and also the situation of islands;
- emphasis on better regulation and need to minimise economic and administrative burden.
- calls to propose without delays further measures to foster stronger demand for recycled materials, develop and promote standards and certification on the content of secondary raw materials;
- need to intensify the discussion on re-use and repair of certain products; of examining the potential of new business models; calls for a reparability scoring system for electronic and electrical equipment; study the feasibility of introducing a regulatory environmental label.

Council Conclusions “Sustainable Chemicals Strategy of the Union: Time to Deliver from 2021

In June 2021, The Council concluded – in the context of the Chemicals Strategy for Sustainability – that “the future Sustainable Products Initiative is crucial to stimulate the production and use of chemicals, materials and products that are safe and sustainable already at the design stage”, and stressed “the importance of clear legal provisions in EU product law and in the Sustainable Products Initiative ensuring that chemicals, materials and products are safe and sustainable by-design”.

Annex 6: The current Ecodesign framework

BACKGROUND

Ecodesign plays a key role in the European Union's efforts to achieve its energy efficiency targets.

In the course of the 1990's Council Directives were adopted setting minimum energy efficiency requirements for boilers (1992), refrigerators and freezers (1996) and fluorescent lamp ballasts (2000). These aimed at **avoiding the fragmentation of the internal market** (Member States had initially introduced or expressed the desire to introduce national requirements) and at ensuring that the increased circulation of products on the internal market did not result in a proliferation of cheaper, low-efficiency appliances.

To set a framework for future work, in 2003 the European Commission then proposed the Ecodesign of Energy-Using Products Directive (adopted in July 2005)⁶³. The directive allowed for product specific implementing measures adopted in comitology, containing minimum requirements that would remove the worst performing products from the market. The rationale behind this approach was to allow for fast progress in highly technical matters, while maintaining legal soundness and cooperation among the institutions of the EU.

In 2009, the Ecodesign Directive's scope was extended to cover also energy-related products, i.e. products that do not use energy themselves but have an influence on other products' energy use, such as building controls or thermal insulation. Today, the **Ecodesign Framework Directive**⁶⁴ sets a framework requiring manufacturers of energy-related products to improve the environmental performance of their products by meeting minimum energy efficiency requirements, as well as other environmental criteria such as water consumption, emission levels, minimum durability of certain components or requirements on reparability (including upgrades), recyclability, ease of reuse and end-of-life treatment before they can place their products on the market. It does so by setting requirements applicable at the moment a product is placed on the market.

Together with the Energy Labelling Regulation, this legislative framework pushes industry to improve the energy efficiency of products and removes the worst-performing ones from the market. It also helps consumers and companies to reduce their energy bills. In the industrial and services sectors, this results in support to competitiveness and innovation. Finally, it ensures that manufacturers and importers responsible for placing products on the European Union (EU) market only have to comply with EU-wide rules, instead of Member State legislation. Some of its main achievements are highlighted below.

This legislative framework benefits from **broad support** from European industries⁶⁵, consumers⁶⁶, environmental non-governmental organisations (NGOs)^{67,68} and Member States (MSs), because of its

⁶³ Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council. OJ L 2005 191 0029, 22/07.2005

⁶⁴ Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products. OJ L OJ L 285, 31.10.2009, p. 10 (Ecodesign Framework Directive)

⁶⁵ “[...] Our industry organisations, representing the heating, cooling, refrigeration, household appliance, commercial cleaning appliance and lighting sectors, strongly support Ecodesign and Energy Labelling which, for a number of product groups, have proven very successful and contributed to the EU's energy and climate goals by pushing and pulling the market towards more energy efficient products. [...]”, from the joint letter of 6 industry associations on ecodesign [<https://www.applia-europe.eu/topics/121-joint-industry-letter-on-ecodesign>]

⁶⁶ “How consumers benefit from ecodesign year after year”, The European Consumer Organisation (BEUC), https://www.beuc.eu/publications/beuc-x-2016-109-benefits_of_ecodesign_for_eu_households_executive_summary.pdf

⁶⁷ “Support Ecodesign and energy labels, NGOs tell Regulatory Scrutiny Board” [<https://www.coolproducts.eu/policy/support-ecodesign-and-energy-labels-ngos-tell-regulatory-scrutiny-board/>]

⁶⁸ “Environmental NGOs and repair groups call for a significant increase in resources dedicated to the development of EU Ecodesign and Energy Labelling policies” [<https://www.coolproducts.eu/wp-content/uploads/2021/03/NGO-letter-on-ecodesign-delays.pdf>]

positive effects on innovation, increased information for consumers and lower costs, as well as environmental benefits.

Ecodesign and energy labelling are **recognised globally** as one of the most effective policy tools in the area of energy efficiency. They are central to making Europe more energy efficient, contributing in particular to the ‘Energy Union Framework Strategy’⁶⁹, and to the priority of a ‘Deeper and fairer internal market with a strengthened industrial base’⁷⁰. The 2030 Climate Target Plan⁷¹ notes that EU product efficiency standards have reduced their energy needs by about 15% and cut EU GHG emissions by 7%, while creating many additional jobs.

PROCESSES AND ROLE OF THE INSTITUTIONS

The Ecodesign Framework Directive establishes conditions for laying down product-specific requirements in regulations adopted by the European Commission. As an alternative to the mandatory ecodesign requirements, voluntary agreements or other self-regulation measures can be presented by the industry⁷².

The Figure below gives an overview of the process:

⁶⁹ Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee, The Committee Of The Regions And The European Investment Bank - A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy. COM/2015/080 final. (Energy Union Framework Strategy)

⁷⁰ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Upgrading the Single Market: more opportunities for people and business COM/2015/550 final. 28 October 2015. (Deeper and fairer internal market)

⁷¹ COM(2020) 562 final, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0562>

⁷² Article 17, of Directive 2009/125

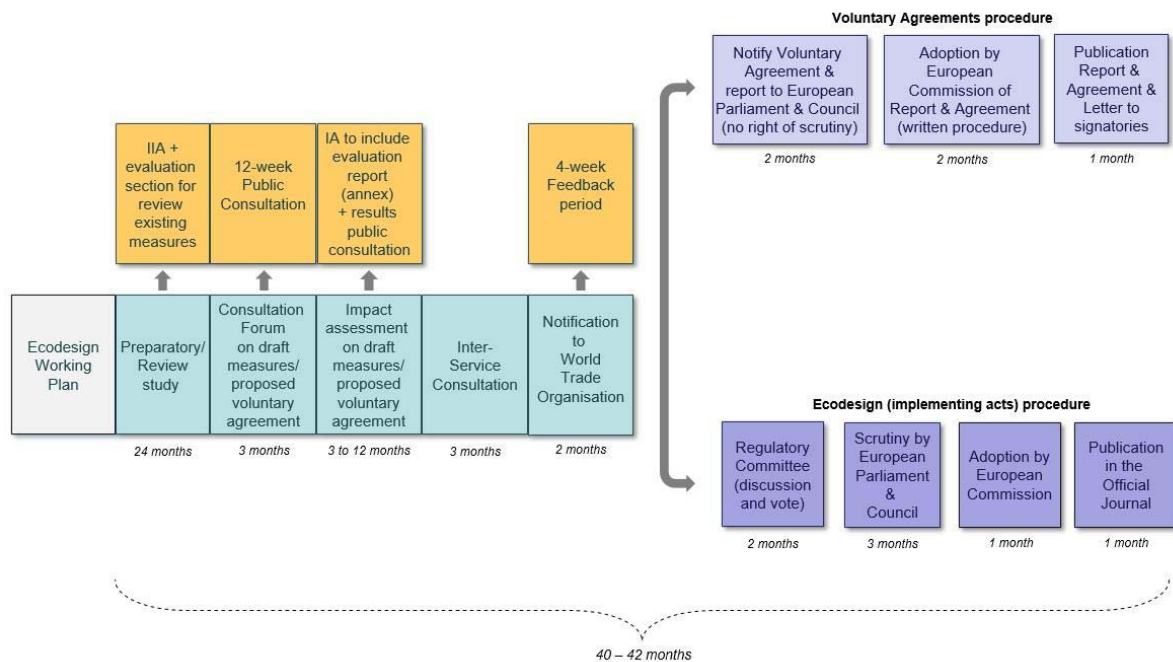


Figure 1 Ecodesign regulatory process

The process starts with establishing the priorities for Union action in this area. Priority product groups are selected based on their potential for cost-effective reduction of their environmental impact and following a fully transparent process culminating in working plans that outline the priorities for the development of implementing measures.

A first list of priority product groups was provided in the former Ecodesign Directive itself (2005/32/EC, Article 16). Subsequently, the (first) Ecodesign Working Plan 2009-2011, the (second) Ecodesign Working Plan 2012-2014 and the Ecodesign Working Plan 2016-2019 were adopted by the European Commission after consultation of the Ecodesign Consultation Forum (consisting of MSs' and other stakeholders' representatives⁷³) which has been replaced by the “Ecodesign and Energy Labelling Consultation Forum”. The Ecodesign and energy labelling working plan 2020-2024 is under preparation at the moment of drafting this impact assessment.

The products listed in the three plans (1st working plan: 1-10; 2nd working plan: 11-18; 3rd working plan: 19-25) can be found the Table below.

⁷³ Article 18 of the Ecodesign Directive establishes a Consultation Forum, to ensure “a balanced participation of Member States’ representatives and all interested parties concerned with the product or product group in question, such as industry, including SMEs and craft industry, trade unions, traders, retailers, importers, environmental protection groups and consumer organisations.”

Table 18 Overview of products listed in the 3 Working plans that have been adopted (1st working plan: 1-10; 2nd working plan: 11-18; 3rd working plan: 19-25)

| Working plan | Products |
|------------------------------|---|
| 1 st working plan | 1. Air-conditioning and ventilation systems (commercial and industrial) |
| | 2. Electric and fossil-fuelled heating equipment |
| | 3. Food preparing equipment (including coffee machines) |
| | 4. Industrial and laboratory furnaces and ovens |
| | 5. Machine tools |
| | 6. Network, data processing and data storing equipment |
| | 7. Refrigerating and freezing (professional) |
| | 8. Sound and imaging equipment (incl. game consoles) |
| | 9. Transformers |
| | 10. Water-using equipment |
| 2 nd working plan | 11. Window products |
| | 12. Steam boilers (< 50MW) |
| | 13. Power cables |
| | 14. Enterprises' servers, data storage and ancillary equipment |
| | 15. Smart appliances/meters |
| | 16. Lighting systems |
| | 17. Wine storage appliances (c.f. Ecodesign regulation 643/2009) |
| | 18. Water-related products |

| | |
|------------------------------|---|
| 3 rd working plan | 19. Building automation control systems |
| | 20. Electric kettles |
| | 21. Hand dryers |
| | 22. Lifts |
| | 23. Solar panels and inverters |
| | 24. Refrigerated containers |
| | 25. High- pressure cleaners |

Once the product group has been selected, a preparatory study is undertaken by an independent consultant, also involving extensive technical discussions with interested stakeholders. The preparatory study follows the Methodology for the Ecodesign of Energy-related Products (MEErP), (see section 0 Evaluation

In 2012 the Centre for Strategy and European Studies carried out an evaluation of the Ecodesign Directive. This concluded that in general the operation of the Directive was satisfactory although somewhat early to judge its full effects.

The evaluation did observe that: *“The Commission has not dedicated sufficient resources to play its critical part in the implementing process. In comparison to other regions implementing similar legislative measures the resources dedicated by the Commission are much more limited. The DoE in the US has in the region of 10 times the number of desk officers available in DG ENER and ENTR in the Commission. In China there are about 70 staff and more than 40 product regulations. There is a similar disparity in terms of resources devoted to the necessary studies.”*

With regard to the cost implications of more resources being dedicated to Ecodesign it noted that: *“...costs are a small fraction of the expected savings from the measures adopted...it is undisputable that the Ecodesign policy would be highly cost-effective, if the resources were available to carry through the current programme to completion in a reasonable time frame”*

The evaluation also looked at the possible extension of the Directive to non-energy related products. It concluded that: *“In principle, extension of the Ecodesign Directive to cover non-energy related goods would make available a very important instrument for sustainable growth policy and add another element in a coherent framework for policy implementation. However, if any extension of the Directive is not to be an empty gesture, it is necessary to ensure that implementation and enforcement of legal requirements is feasible, practicable and cost-effective.”*

A consideration of staff resources shows that the level of human resources has not improved since the evaluation while the number of product groups regulated has grown substantially. The resulting pressures have led to considerable delays in the implementation of the 2016 to 2019 working plan. This has led to an assessment by EEB and ECOS. [This concludes that there will be an extra 10MT CO₂ emissions in the period 2020 to 2030 as a result of delays that have occurred in the 2016-19 period. They estimate that a further 58MT CO₂ emissions could be avoided over that period with a better implementation of the next working plan.]

Methodology below). Subsequently, the European Commission's first drafts of Ecodesign measures are submitted for discussion to the Consultation Forum.

At the same time, the European Commission can verify that a potential implementing regulation would respect the criteria listed under Article 15 of the Ecodesign Directive:

“(a) the product shall represent a significant volume of sales and trade, indicatively more than 200 000 units a year within the Community according to the most recently available figures;

(b) the product shall, considering the quantities placed on the market and/or put into service, have a significant environmental impact within the Community, as specified in the Community strategic priorities as set out in Decision No 1600/2002/EC; and

(c) the product shall present significant potential for improvement in terms of its environmental impact without entailing excessive costs, taking into account in particular:

(i) the absence of other relevant Community legislation or failure of market forces to address the issue properly; and

(ii) a wide disparity in the environmental performance of products available on the market with equivalent functionality.”

After the Consultation Forum, the European Commission drafts an impact assessment, which after approval of the Regulatory Scrutiny Board is taken forward to the inter-service consultation together with draft implementing measures. In this and subsequent steps, the Parliament's functional mailboxes for delegated/implementing measures are copied on each message from the European Commission services. After the inter-service consultation, stakeholders are alerted when the draft measures are published in the World Trade Organization (WTO) notification database.

After the WTO notification phase is completed, the two procedures follow different paths. The draft energy labelling delegated act is discussed in a MS Expert Group where opinion(s) are expressed and consensus is sought but no vote is taken. The draft Ecodesign measure is submitted for vote to the Regulatory Committee of Member States experts.

The European Parliament and Council have the right of scrutiny for which a period of up to four months, if requested, is foreseen. Within this time the co-legislators can block the adoption process by the European Commission. Parliament committees sometimes discuss draft objections to measures (light bulbs and fridges in 2009) or vote to reject a measure (vacuum cleaners in 2013⁷⁴). On one occasion an objection was even adopted in plenary, blocking the measure for televisions in 2009⁷⁵.

Today, 32 Ecodesign Regulations and 2 voluntary agreements are in force. An overview of these measures can be found in Table 19.

⁷⁴ This objection was defeated in ENVI committee by 43 votes against and 4 in favour.

⁷⁵ The motivation of the objection was that the European Parliament (EP) wanted to delay the discussion of the draft labelling measure so that it would have to become a delegated act under the recast post-Lisbon Energy Labelling Directive in 2010. The measure was indeed subsequently adopted as a delegated act.

Table 19 Overview of applicable Ecodesign measures

| | Ecodesign |
|---------------------|---|
| Ecodesign framework | Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products |
| Heaters | <p>Council Directive 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels (only Articles 7(2) and 8 and Annexes III to V)</p> <p>Commission Regulation (EU) No 813/2013 of 2 August 2013 with regard to ecodesign requirements for space heaters and combination heaters</p> <p>Commission Regulation (EU) No 814/2013 of 2 August 2013 with regard to ecodesign requirements for water heaters and hot water storage tanks</p> <p>Commission Regulation (EU) 2015/1185 of 24 April 2015 with regard to ecodesign requirements for solid fuel local space heaters</p> <p>Commission Regulation (EU) 2015/1188 of 28 April 2015 with regard to ecodesign requirements for local space heaters</p> <p>Commission Regulation (EU) 2015/1189 of 28 April 2015 with regard to ecodesign requirements for solid fuel boilers</p> <p>Commission Regulation (EU) 2016/2281 of 30 November 2016 with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units</p> |
| Off mode & standby | <p>Commission Regulation (EC) No 1275/2008 of 17 December 2008 with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment</p> <p>Commission Regulation (EU) No 801/2013 of 22 August 2013 amending Regulation (EC) No 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No 642/2009 with regard to ecodesign requirements for televisions</p> |
| Lighting | <p>From 1 September 2021:</p> <p>Commission Regulation (EU) 2019/2020 of 1 October 2019 laying down ecodesign requirements for light sources and separate control gears</p> <p>Until 31 August 2021:</p> <p>Commission Regulation (EC) No 244/2009 of 18 March 2009 with regard to ecodesign requirements for non-directional household lamps</p> <p>Commission Regulation (EC) No 245/2009 of 18 March 2009 with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps</p> <p>Commission Regulation (EU) No 1194/2012 of 12 December 2012 with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment</p> |

| | |
|-------------------------------------|---|
| Refrigeration | <p>Commission Regulation (EU) 2015/1095 of 5 May 2015 with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers</p> <p>Commission Regulation (EU) 2019/2019 of 1 October 2019 laying down ecodesign requirements for refrigerating appliances</p> <p>Commission Regulation (EU) 2019/2024 of 1 October 2019 laying down ecodesign requirements for refrigerating appliances with a direct sales function</p> |
| Washing machines & washer-dryers | Commission Regulation (EU) 2019/2023 of 1 October 2019 laying down ecodesign requirements for household washing machines and household washer-dryers |
| Motors | <p>From 1 July 2021:</p> <p>Commission Regulation (EU) 2019/1781 of 1 October 2019 laying down ecodesign requirements for electric motors and variable speed drives, amending Regulation (EC) No 641/2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products</p> <p>Until 30 June 2021:</p> <p>Commission Regulation (EC) No 640/2009 of 22 July 2009 with regard to ecodesign requirements for electric motors</p> |
| Circulators | <p>Commission Regulation (EC) No 641/2009 of 22 July 2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products</p> <p>Commission Regulation (EU) No 622/2012 of 11 July 2012 amending Regulation (EC) No 641/2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products</p> <p>Commission Regulation (EU) 2019/1781 of 1 October 2019 laying down ecodesign requirements for electric motors and variable speed drives, amending Regulation (EC) No 641/2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products</p> |
| Water pumps | Commission Regulation (EU) No 547/2012 of 25 June 2012 with regard to ecodesign requirements for water pumps |
| Tumble driers | Commission Regulation (EU) No 932/2012 of 3 October 2012 with regard to ecodesign requirements for household tumble driers |
| Computers and servers | <p>Commission Regulation (EU) No 617/2013 of 26 June 2013 with regard to ecodesign requirements for computers and computer servers</p> <p>Commission Regulation (EU) 2019/424 of 15 March 2019 laying down ecodesign requirements for servers and data storage products amending Commission Regulation (EU) No 617/2013</p> |
| Vacuum cleaners | Commission Regulation (EU) No 666/2013 of 8 July 2013 with regard to ecodesign requirements for vacuum cleaners |
| Electronic displays (including TVs) | Commission Regulation (EU) 2019/2021 of 1 October 2019 laying down ecodesign requirements for electronic displays |

| | |
|---|--|
| External power supplies | Commission Regulation (EU) 2019/1782 of 1 October 2019 laying down ecodesign requirements for external power supplies |
| Cooking appliances | Commission Regulation (EU) No 66/2014 of 14 January 2014 with regard to ecodesign requirements for domestic ovens, hobs and range hoods |
| Power transformers | Commission Regulation (EU) No 548/2014 of 21 May 2014 with regard to small, medium and large power transformers Commission Regulation (EU) 2019/1783 of 1 October 2019 amending Regulation (EU) No 548/2014 with regard to small, medium and large power transformers |
| Air conditioners and fans (including ventilation units) | Commission Regulation (EU) No 206/2012 of 6 March 2012 with regard to ecodesign requirements for air conditioners and comfort fans Commission Regulation (EU) No 327/2011 of 30 March 2011 with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW Commission Regulation (EU) No 1253/2014 of 7 July 2014 with regard to ecodesign requirements for ventilation units Commission Regulation (EU) 2016/2281 of 30 November 2016 with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units |
| Dishwashers | Commission Regulation (EU) 2019/2022 of 1 October 2019 laying down ecodesign requirements for household dishwashers |
| Welding equipment | Commission Regulation (EU) 2019/1784 of 1 October 2019 laying down ecodesign requirements for welding equipment |
| Omnibus | Commission Regulation (EU) 2021/341 of 23 February 2021 amending Regulations (EU) 2019/424, (EU) 2019/1781, (EU) 2019/2019, (EU) 2019/2020, (EU) 2019/2021, (EU) 2019/2022, (EU) 2019/2023 and (EU) 2019/2024 with regard to ecodesign requirements for servers and data storage products, electric motors and variable speed drives, refrigerating appliances, light sources and separate control gears, electronic displays, household dishwashers, household washing machines and household washer-dryers and refrigerating appliances with a direct sales function |
| Imaging equipment | Voluntary agreement – Report from the Commission to the European Parliament and the Council on the voluntary ecodesign scheme for imaging equipment COM/2013/023 final |
| Game consoles | Voluntary agreement - Report from the Commission to the European Parliament and the Council on the voluntary ecodesign scheme for games consoles COM/2015/0178 final |

Self-regulation

As an alternative to regulation, the Ecodesign Directive states that priority should be given to alternative courses of action such as self-regulation by the industry where such action is likely to deliver the policy objectives faster or in a less costly manner than mandatory requirements. Self-regulation, including voluntary agreements offered as unilateral commitments by industry, can enable

quick progress due to rapid and cost-effective implementation, and allows for flexible and appropriate adaptations to technological options and market sensitivities.

The European Commission assesses each self-regulatory initiative on a case by case basis after consulting the members of the Consultation Forum and taking into account the findings of the technical/economic preparatory study if available. The basis for the assessment whether a proposal goes beyond business-as-usual is the information provided by the industry and affected parties and, if available, the findings of the preparatory study. Voluntary agreements are expected to include quantified and staged objectives, starting from a well-defined baseline and measured through verifiable indicators. Voluntary agreements also need arrangements for independent verification as they are not necessarily subject to market surveillance by Member States.

Guidelines on self-regulation⁷⁶ were adopted by the European Commission on 30 November 2016.

EVALUATION

In 2012 the Centre for Strategy and European Studies carried out an evaluation of the Ecodesign Directive. This concluded that in general the operation of the Directive was satisfactory although somewhat early to judge its full effects.

The evaluation did observe that: *“The Commission has not dedicated sufficient resources to play its critical part in the implementing process. In comparison to other regions implementing similar legislative measures the resources dedicated by the Commission are much more limited. The DoE in the US has in the region of 10 times the number of desk officers available in DG ENER and ENTR in the Commission. In China there are about 70 staff and more than 40 product regulations. There is a similar disparity in terms of resources devoted to the necessary studies.”*

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The evaluation also looked at the possible extension of the Directive to non-energy related products. It concluded that: *“In principle, extension of the Ecodesign Directive to cover non-energy related goods would make available a very important instrument for sustainable growth policy and add another element in a coherent framework for policy implementation. However, if any extension of the Directive is not to be an empty gesture, it is necessary to ensure that implementation and enforcement of legal requirements is feasible, practicable and cost-effective.”*

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METHODOLOGY

The Ecodesign directive 2009/125/EC prescribes that in preparing a draft implementing measure, the European Commission shall make a series of analyses and assessments, which hereafter shall be

⁷⁶ Commission Recommendation (EU) 2016/2125 of 30 November 2016 on guidelines for self-regulation measures concluded by industry under Directive 2009/125/EC of the European Parliament and of the Council; OJ L 329, 3.12.2016, p.109

referred to as “the preparatory study”. Art 15(3) to 15(10) of the Ecodesign directive set out the legal basis for preparing Ecodesign draft implementing measures. Annexes I and II are referenced in Art. 15 and provide more detail. Note that Annex II specifically mentions the ‘technical, environmental and economic analysis’, which is now commonly known as the ‘preparatory study’. The following checklist of ecodesign parameters is taken from Annex I, Part 1.

| | |
|------------|--|
| 1.1 | In so far as they relate to product design, significant environmental aspects must be identified with reference to the following phases of the life cycle of the product: |
| a | raw material selection and use |
| b | Manufacturing |
| c | packaging, transport, and distribution |
| d | installation and maintenance |
| e | Use |
| f | end-of-life, meaning the state of a product having reached the end of its first use until its final disposal |

| | |
|------------|---|
| 1.2 | For each phase, the following environmental aspects must be assessed where relevant: |
| a | predicted consumption of materials, of energy and of other resources such as fresh water |
| b | anticipated emissions to air, water or soil |
| c | anticipated pollution through physical effects such as noise, vibration, radiation, electromagnetic fields |
| d | expected generation of waste material |
| e | possibilities for reuse, recycling and recovery of materials and/or of energy, taking into account Directive 2002/96/EC |

| | |
|------------|--|
| 1.3 | In particular, the following parameters must be used, as appropriate, and supplemented by others, where necessary, for evaluating the potential for improving the environmental aspects referred to in point 1.2: |
| a | weight and volume of the product |
| b | use of materials issued from recycling activities |
| c | consumption of energy, water and other resources throughout the life cycle |
| d | use of substances classified as hazardous to health and/or the environment according to Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations |

| | |
|----------|---|
| | and administrative provisions relating to the classification, packaging and labelling of dangerous substances (1) and taking into account legislation on the marketing and use of specific substances, such as Council Directive 76/769/EEC of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (2) or Directive 2002/95/EC |
| e | quantity and nature of consumables needed for proper use and maintenance |
| f | ease for reuse and recycling as expressed through: number of materials and components used, use of standard components, time necessary for disassembly, complexity of tools necessary for disassembly, use of component and material coding standards for the identification of components and materials suitable for reuse and recycling (including marking of plastic parts in accordance with ISO standards), use of easily recyclable materials, easy access to valuable and other recyclable components and materials; easy access to components and materials containing hazardous substances |
| g | incorporation of used components |
| h | avoidance of technical solutions detrimental to reuse and recycling of components and whole appliances |
| i | extension of lifetime as expressed through: minimum guaranteed lifetime, minimum time for availability of spare parts, modularity, upgradeability, reparability |
| j | amounts of waste generated and amounts of hazardous waste generated |
| k | emissions to air (greenhouse gases, acidifying agents, volatile organic compounds, ozone depleting substances, persistent organic pollutants, heavy metals, fine particulate and suspended particulate matter) without prejudice to Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non- road mobile machinery |
| l | emissions to water (heavy metals, substances with an adverse effect on the oxygen balance, persistent organic pollutants) |
| m | emissions to water (heavy metals, substances with an adverse effect on the oxygen balance, persistent organic pollutants) |
| n | Miscellaneous health-related impacts for user and direct environment: Noise, Radiation (e.g. radon in building materials), Vibration (e.g. of machine tools) |

In this context, the underlying Methodology for the Ecodesign of Energy-related Products (MEErP)⁷⁷ is intended to provide operational guidance to the European Commission and possible contractors providing technical assistance to the European Commission in performing the preparatory study in

⁷⁷ Methodology for Ecodesign of Energy-related Products - MEErP 2011 - Methodology Report - Part 1: Methods, <https://ec.europa.eu/docsroom/documents/26525>

accordance with the stipulations in the Ecodesign directive. The preparatory study is concluded with a preparatory study report.

The stages following the preparatory study are not covered by the MEErP, although the MEErP seeks to anticipate the requirements of these subsequent stages. More specifically, the underlying methodology is designed so that it can be integrated in the European Commission Impact Assessment. Following stakeholder comments (see MEErP 2011 Project Report)⁷⁸ the MEErP structure makes a clear split between:

- Tasks 1 to 4 (product definitions, standards and legislation; economic and market analysis; consumer behaviour and local infrastructure; technical analysis) that have a clear focus on data retrieval and initial analysis; and
- Tasks 5 (assessment of base case), 6 (improvement potential) and 7 (policy, scenario, impact and sensitivity analysis) with a clear focus on modelling.

Tasks 1 to 4 have a dual purpose. They should not only provide the inputs for the modelling in Tasks 5 to 7, but they are also intended for capacity building. After having read the first 4 Task reports policy makers and all stakeholders should have enough background to talk to each other and have a basic understanding of each other's problems. Tasks 5 to 7 are intended to provide the analysis whether and which ecodesign requirements should be set for the energy-related product. As such the preparatory study is the first step in the European Commission's decision making process towards the subsequent process of drawing up draft legislation, comprising the consultation of interested stakeholders in the Ecodesign Consultation Forum, the European Commission's Impact Assessment, the vote by Member States in the Regulatory Committee, the scrutiny by European Parliament and Council and the adoption of legislation. As an alternative to legislation, the industry may propose a self-regulation or the European Commission may propose no measure. More specifically, the tasks entail:

- Task 1 - Scope (definitions, standards and legislation);
- Task 2 – Markets (volumes and prices)
- Task 3 – Users (product demand side);
- Task 4 - Technologies (product supply side, includes both BAT and BNAT);
- Task 5 – Environment & Economics (Base case LCA & LCC);
- Task 6 – Design options;
- Task 7 – Scenarios (Policy, scenario, impact and sensitivity analysis).

⁷⁸ Methodology for ecodesign of energy-related products MEErP 2011 - project report, 2014, Catalogue number NB-01-14-225-EN-N, available at: <https://op.europa.eu/en/publication-detail/-/publication/be880e05-7528-415d-b592-e9f29e787635>

Tasks 1 to 4 can be performed in parallel, whereas 5, 6 and 7 are sequential (see diagram)

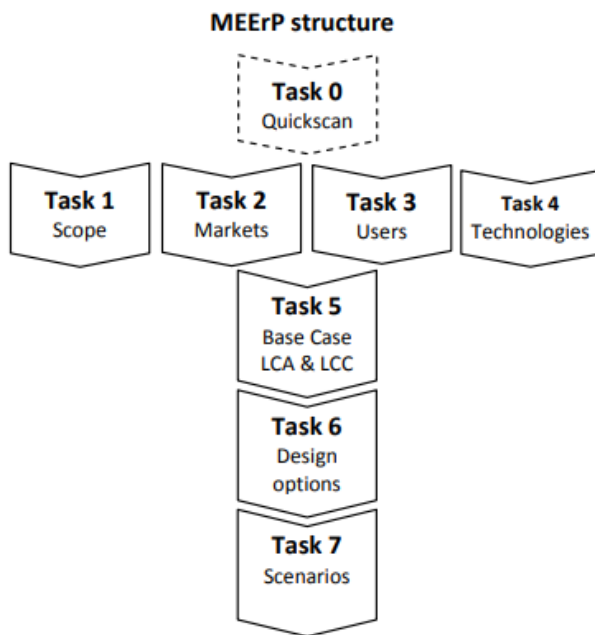


Figure 2: MEErP Structure

Task 0 is an optional task for the case of large or inhomogeneous product groups, where it is recommended to carry out a first product screening, considering the environmental impact and potential for improvement of the products as referred to in Article 15 of the Ecodesign Directive. The objective is to re-group or narrow the product scope, as appropriate from an ecodesign point of view, for the subsequent analysis in tasks 1-7.

Task 1 should define the product category and define the system boundaries of the ‘playing field’ for ecodesign. It is important for a realistic definition of design options and improvement potential and it is also relevant in the context of technically defining any implementing legislation or voluntary measures (if any). Furthermore, Task 1 is the basis for the test and calculation methods to be used to regulate relevant ecodesign parameters. It should be checked whether accurate, reliable and reproducible methods exist and/or, if they don’t exist or the methods are partly flawed, how this problem could be addressed. Finally, Task 1 is important as:

- it makes an inventory of what measures already exist in the EU (with possible regulatory failures);
- it analyses the legislation in EU Member States, which the Ecodesign directive tries to harmonise for the sake of a single market; and
- it indicates –also in view of the global competitiveness and hinting at feasible target levels— what measures have been taken in the rest of the world outside the EU.

Task 2 aims to:

- place the product group within the total of EU industry and trade policy (subtask 2.1);
- provide market and cost inputs for the EU-wide environmental impact of the product group (subtask 2.2);
- provide insight in the latest market trends so as to indicate the place of possible ecodesign measures in the context of the market-structures and ongoing trends in product design (subtask 2.3, also relevant for the impact analyses in Task 3);
- provide a practical data set of prices and rates to be used in a Life Cycle Cost (LCC) calculation (Subtask 2.4).

Task 3 Consumer behaviour can - in part - be influenced by product-design but overall it is a very relevant input for the assessment of the environmental impact and the Life Cycle Costs of a product. One aim is to identify barriers and restrictions to possible ecodesign measures, due to social, cultural or infra-structural factors. A second aim is to quantify relevant user-parameters that influence the environmental impact during product-life and that are different from the Standard test conditions as described in Subtask 1.2.⁷⁹

Task 4 entails a general technical analysis of current products on the EU-market and provides general inputs for the definition of the Base case(s) (task 5) as well as the identification of the improvement potential (task 6). As mentioned, the new Task 4 now incorporates the full range of technical reporting, from a description of the existing products up to BAT (Best Available Technology) and BNAT (Best Not yet Available Technology).

Task 5 requires that one or more average EU product (s) have to be defined or a representative product category as the “Base-case” for the whole of the EU-27 has to be chosen. On this Base-Case most of the environmental and Life Cycle Cost analyses will be built throughout the rest of the study. The Base-Case is a conscious abstraction of reality, necessary one for practical reasons. Having said that, the question if this abstraction leads to inadmissible conclusions for certain market segments will be addressed in the impact- and sensitivity analysis. The description of the Base-Case is the synthesis of the results of Tasks 1 to 4 and the point-of- reference for tasks 6 (improvement potential) and 7 (policy, scenario, impact and sensitivity analysis). With respect of former MEEuP 2005 there is no longer a distinction between a Standard BaseCase, i.e. using impact values (efficiency etc.) as published by industry in accordance with test standards, and a Real-Life BaseCase, i.e. using impact values as they occur in practice. Only the latter is required, where the analysts will use a multiplier to translate the Standard values into Real-Life values.

Task 6 Identifies design options, their monetary consequences in terms of Life Cycle Cost for the consumer, their environmental costs and benefits and pinpointing the solution with the Least Life Cycle Costs (LLCC) and the BAT. The assessment of monetary Life Cycle Costs is relevant to indicate whether design solutions might negatively or positively impact the total EU consumer’s expenditure over the total product life (purchase, running costs, etc.), while taking into account for the purchase price development the manufacturers’ R&D and investment costs. The distance between the LLCC and the BAT indicates - in a case a LLCC solution is set as a minimum target - the remaining space for product-differentiation (competition). The BAT indicates a medium-term target that would

⁷⁹ Examples are the actual temperature-settings for laundry and dishwashing equipment, the loading efficiency (real load vs. nominal capacity) for a whole range of appliances, power management enabling rate for ICT equipment, etc.

probably more subject to promotion measures than restrictive action. The BNAT indicates long-term possibilities and helps to define the exact scope and definition of possible measures.

Task 7 summarizes and totals the outcomes of all previous tasks. It looks at suitable policy means to achieve the potential e.g. implementing LLCC as a minimum and BAT as a promotional target, using legislation or voluntary agreements, labelling, benchmarks and possible incentives. It draws up scenarios 1990 – 2020/2030/2050 quantifying the improvements that can be achieved vs. a Business-as-Usual scenario and compares the outcomes with EU environmental targets, the societal costs if the environmental impact reduction would have to be achieved in another way, etc. It makes an estimate of the impact on consumers (purchasing power, societal costs) and industry (employment, profitability, competitiveness, investment level, etc.) as described in Annex II of the Ecodesign Directive 2009/125/EC, explicitly describing and taking into account the typical design cycle (platform change) in a product sector. Finally, in a sensitivity analysis of the main parameters it studies the robustness of the outcome.

MARKET SURVEILLANCE AND BORDER CONTROLS RELATED TO ECODESIGN

The need for market surveillance and border controls

Effective market surveillance and controls on products entering the EU market constitute a key factor to ensure the effectiveness of the entire Ecodesign framework. It is needed to ensure that the regulations are properly enforced, that the expected energy savings materialise, that the level playing field for businesses is secured, that reliable product information is supplied to consumers, and that the whole framework is trusted by citizens and businesses alike.

Market surveillance authorities must, amongst others:

- Check that products placed on the EU market comply with minimum performance requirements set by ecodesign measures. Otherwise, high energy-consuming goods would still be purchased by consumers, and consumers would not enjoy the economic benefits that ecodesign brings through more efficient products and reduced energy bills.
- Check that the mandatory information provided to consumers is correct.

Customs authorities, remaining at the front line to stop suspicious products being imported from the third countries before they are placed in the EU market, are expected, among others, to:

- Check if products are accompanied by required documentation, properly marked or labelled and bear a CE marking or other required marking, if names and other contact information of economic operators are indicated or identifiable in accordance with Article 4(4) of Regulation 2019/1020,
- Make sure that there is no other cause to believe that these products do not comply with the Union law applicable to them,
- Suspend release of suspicious products for free circulation in the EU, notify accordingly market surveillance authorities and implement market surveillance authorities' final compliance assessments.

Given the importance of the subject, a special effort has been put in elaborating this annex.

The European Court of Auditor's ecodesign audit and the impact of non-compliance

In 2019, the European Court of Auditor conducted an audit on ecodesign and energy labelling. The title of the report, issued early 2020, is very clear:

“EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance”⁸⁰

The report highlights market surveillance as a critical issue, and the executive summary further points out that:

“IX Effective market surveillance should play a critical role in ensuring that products sold in the EU comply with Ecodesign requirements and that consumers benefit from accurate energy labels. It is the role of the Member States to check that products sold comply with the legislation. The data available shows, however, that non-compliance by manufacturers and retailers remains a significant issue.

X The Commission facilitates cooperation between Market Surveillance Authorities. The Information and Communication System on Market Surveillance, operated by the Commission, should enable cooperation by allowing authorities to share inspection results. We found that some functional limitations in the database reduced its effectiveness. The Commission is setting up a product database, which will, among other things, facilitate market surveillance, but this is behind schedule.

XI The EU-funded projects aimed at improving market surveillance have delivered results, but they have only provided a temporary solution for a recurring need.”

As indicated below, it is estimated that about 10% of the potential energy savings delivered by ecodesign and energy labelling are lost due to non-compliance with the regulations. Based on the 2019 Environmental Impact Accounting report figures⁸¹, this represents:

- Additional consumption of 15,3 Mtoe primary **energy** per year in 2020 (or 178 TWh)
- Additional emission of 31,1 Mt CO₂ equivalent **greenhouse gas** (~0,7% of EU total in 2018)
- Additional EUR 6,4 billion/year expenditure for **consumers** on energy bills, at least⁸².
- Potential loss of revenue of EUR 6,4 billion **for industry**, wholesale and retail sector, and corresponding loss of **jobs**.

The report provides three recommendations to the European Commission, in order to improve market surveillance activities and facilitate exchange of information among Market Surveillance Authorities (MSAs):

- (a) deliver improvements to the ICSMS [inspection database⁸³] to facilitate cooperation between Market Surveillance Authorities, for example by enabling the quick identification of equivalent model numbers by cross-linking it with European Product Database for Energy Labelling (EPREL) [energy labelling database⁸⁴];
- (b) upon request, provide online training to MSAs to promote the use of ICSMS to support their activities;
- (c) assess the MSAs’ uptake of best practice on market surveillance activities identified by EU-funded projects, including carrying-out cost-effective inspections.

The European Commission accepted these recommendations, which are being implemented.

⁸⁰ European Court of Auditors, Special Report 01/2020, *EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance*. <https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=52828>

⁸¹ <https://www.vhk.nl/research/cia.htm>

⁸² If the price of the non-compliant goods is the same as the price of the compliant ones, then extra expenses would be higher.

⁸³ https://ec.europa.eu/growth/single-market/goods/building-blocks/icsms_en

⁸⁴ https://ec.europa.eu/info/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/product-database_en

Organisation of market surveillance and border controls

Market surveillance and border controls is a national competence. Member States (MSs) are required to establish a market surveillance authority for all product legislation, including ecodesign. In most Member States, the authority in charge of ecodesign also deals with energy labelling (covering the same products), but it is not always the case. In a number of Member States, market surveillance is a regional competence (Germany, Spain). Often, the authority in charge is a 'generalist' entity also responsible for market surveillance of other EU harmonisation legislation on products, such as the Low Voltage Directive, product safety or others. In other MSs such as Ireland, the market surveillance for ecodesign and energy labelling is the responsibility of a specific entity dealing with energy (e.g. an energy agency).

Member States are also required to designate authorities in charge of the control on products entering the Union market. In most Member States, this role is attributed to customs authorities, which are expected to perform their product compliance controls in cooperation with market surveillance authorities. The level, intensity and methods of this cooperation differ across the Member States as they depend on national policies.

Enforcement activities and reporting

Data on enforcement activities by Member States is scarce, because there is currently no reporting obligation under ecodesign and energy labelling, or under the existing market surveillance regulations⁸⁵. The ICSMS database that serves as repository for inspections carried out by MSAs is largely underutilised and only reflects a fraction of MSA's activities.

In the 2014 to 2016 period, DG GROW carried out a voluntary exercise for the reviews and assessments of the functioning of market surveillance activities for all product legislation⁸⁶. Only 21 out of 28 MSs participated and only 17 of them provided information about ecodesign and energy labelling. Two of these datasets cannot be exploited because ecodesign and energy labelling data is mixed with other activities, and two others are largely incomplete. As a conclusion, only 4 MSs provided the complete requested dataset, and 9 provided partial data that can be exploited. Even within this data, there are obvious mistakes and inconsistencies, making interpretation difficult. This difficulty is compounded by the absence of clear definitions: for example one MS may consider that a 'product inspection' means full testing in laboratory, while another might include simple checks like verifying that the energy label is present in shops. After removing suspicious data, it seems that, based on a narrow set of data, EU MSAs had on average an annual budget of EUR 220.000 for ecodesign and energy labelling, carrying about 160 inspections per year concerning 2650 product models, of which 35 were tested in laboratory. Staff figures are the most difficult to interpret: some MSs reported figures as low as 1 full time equivalent⁸⁷ (even less than 1 in one case), while 3 MSs reported well over 100 staff, which does not seem realistic. The average value of the remaining ones is 6 FTE per MS. A careful extrapolation could lead to an overall estimate of about 200-240 staff and a budget of EUR 9-10 million per year spent to survey +/- 50 ecodesign and energy labelling regulations in the EU 28 in the period 2014-2016⁸⁸. The data collection exercise was not renewed after 2016.

The graph below⁸⁹ shows the amount of ecodesign and energy labelling products inspections encoded in ICSMS per year, since 2010. One can see a steady increase from 2010 until 2017, and a slight decrease since then. The recent figures are in the magnitude of 1000 inspections encoded each year,

⁸⁵ Regulation (EU) 765/2008, replaced by Regulation (EU) 2019/1020 that will enter into application on 01/07/2021.

⁸⁶ Country reports can be found here <https://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation/>

⁸⁷ Our understanding, at least for one of the cases, is that the full time equivalent represents the person doing coordination at national level, while inspectors in regional agencies were not accounted for.

⁸⁸ For each MS with 'valid' data, we calculated ratios like staff/inhabitant or budget/GDP, calculated average ratios for the EU, and extrapolated to global EU 28 2015 population or GDP data.

⁸⁹ Source : DG ENER, based on ICSMS data gathered through the 'Kibana' tool.

which is certainly a fraction of the real work carried out by MSAs, but in the absence of any other reporting tool, there is no reliable figure that can be put forward (other than the scarce estimates already provided above).

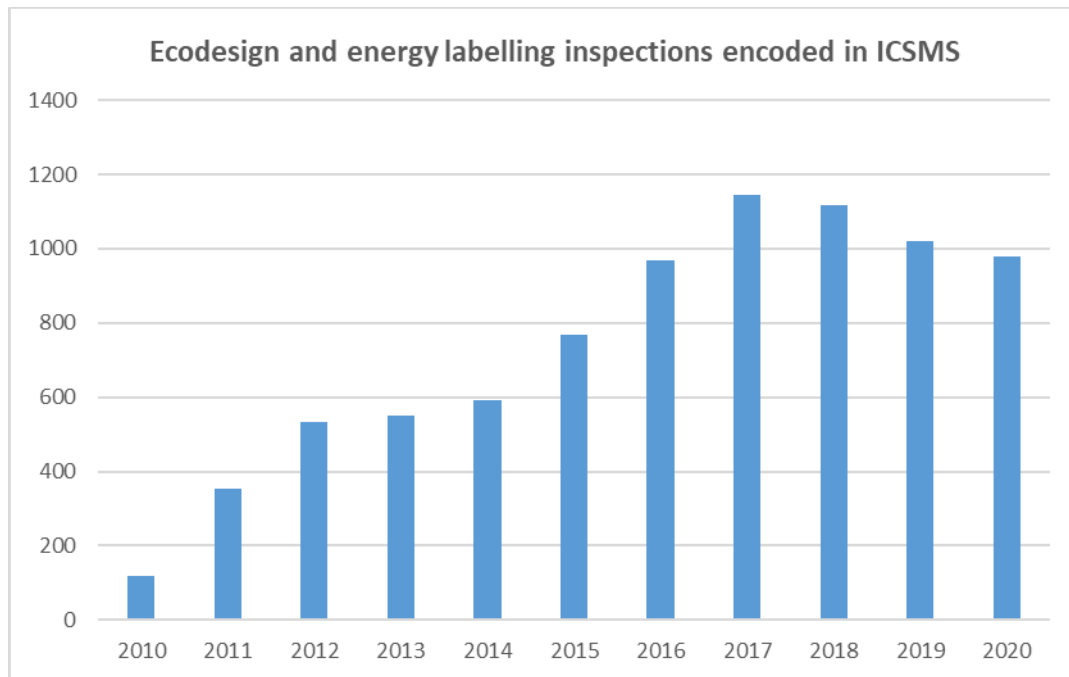


Figure 3 Ecodesign and energy labelling inspections encoded in ICSMS

The interface developed by DG GROW under a 'Kibana' platform is a powerful tool allowing to visualise pertinent data. For instance, the following graph shows the proportion of encoded inspections per MS in 2020:

ED & EL - Cases by Notifying Country

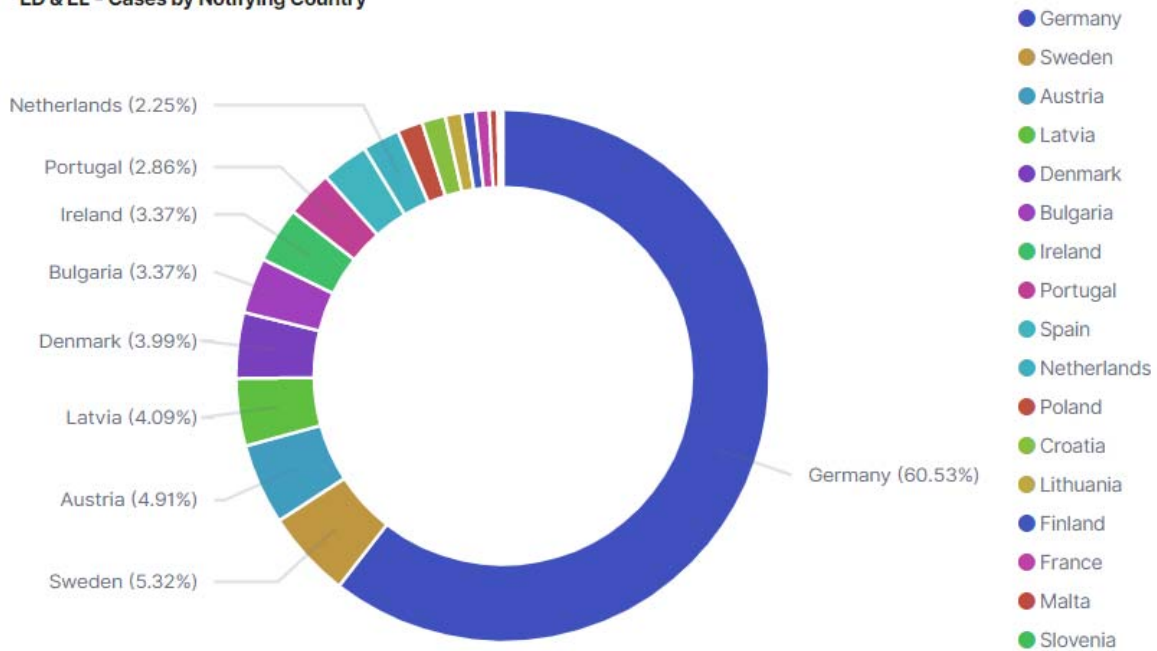


Figure 4 ED & EL - Cases by notifying Country

It shows that the vast majority of inspections are encoded by one MS: Germany. This is probably due to historical reasons: this MS is the original developer of the database, which was used to communicate inspection data across Regions (Länder). It also shows that 10 MS do not encode any data at all, and that several encode very few data.

Another issue is the completeness and quality of the data inserted. The following map shows the country of origin of the inspected goods in 2020 for ecodesign and energy labelling. But the pie chart on the right shows that this information is missing in 80% of the cases.

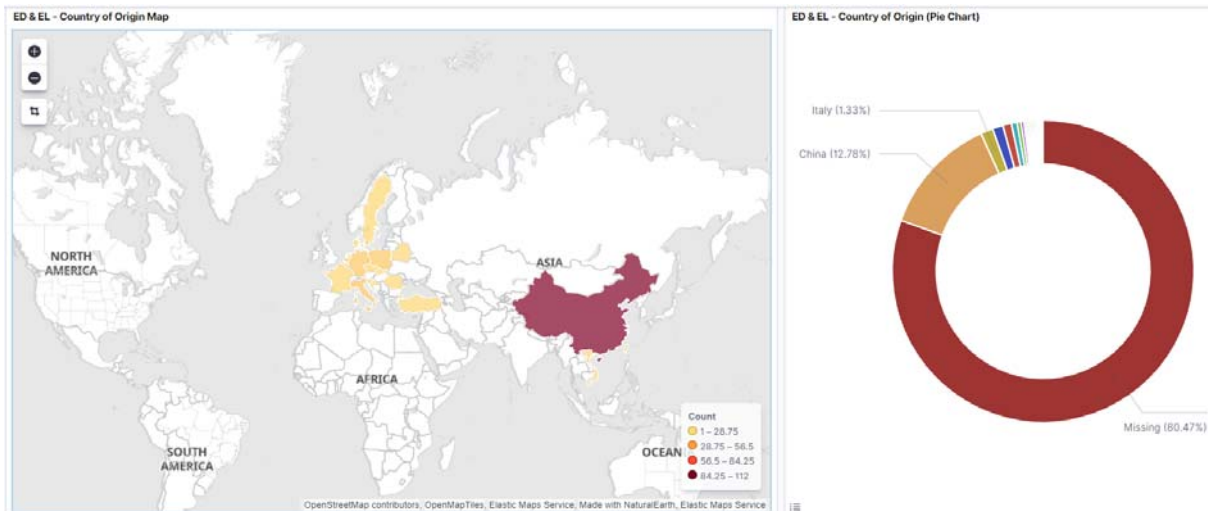


Figure 5 Origin of inspected goods

ICSMS is an important instrument for communication between MSAs and could be very useful to extract relevant data for operational and policy purpose, at MSA, MS and EU level. Its underutilisation undermines this goal.

It is expected that the entry into application of the new market surveillance Regulation (EU) 2019/1020 will improve the situation, as it renders ICSMS utilisation mandatory. Also the European Commission is working closely with the MSs and the MSAs to improve ICSMS usage. For instance, it is developing a dedicated set of fields in the database that are tailored to the needs of ecodesign and energy labelling (in line with one of the ECA audit recommendations mentioned above). This is intended to increase the relevance and usefulness of the database for the MSAs. The European Commission is also working on interfaces that can automatically upload MSAs data into ICSMS in order to avoid double encoding, as well as other improvements to ICSMS.

In addition, as part of the EU Product Compliance Network (EUPCN) mentioned below, the European Commission, with the collaboration of the MSs and the MSAs, is undertaking JRC-supported work for the development of indicators that would allow proper follow-up and monitoring of MSA's activities. These would remain voluntary however.

Qualitatively, MSs use a range of corrective actions to deal with non-compliances, including administrative decisions, withdrawal of models, decisions by customs authorities to reject products at the border, voluntary measures taken by the economic operators concerned and financial penalties.

As regards reporting of statistical data concerning controls of products entering the EU market, DG TAXUD carries out annual collection of the information on the number of product compliance controls performed by customs authorities and on their results.

In 2020, customs in the EU made about 250.000 interventions for product compliance, which resulted in 72.000 cases of release for free circulation being suspended and 21.000 cases where the goods were confirmed by market surveillance authorities as not compliant and as such they were not released for free circulation in the EU.

Expenditure

As indicated above, no precise figures on total Member States expenditure on market surveillance for ecodesign and energy labelling are available. In 2011 this was estimated at EUR 7-10 million⁹⁰. In 2015 it was estimated that, based on (incomplete) data collected from Member States, it was likely to be around EUR 10 million⁹¹. In the previous section, an estimate of EUR 9-10 million per year has been put forward for the period 2014-2016 based on partial data, which is very close to the previous figures and does not show an extraordinary increase. In the period 2014-2016 however, a yearly increase of about 15% was observed, but based on a sample of 8 MSs only.

The above figures include UK. Without UK, the estimate for the period 2014-2016 is about EUR 7,2-8,5 million per year for the EU27. It is unclear whether the underlying data always include staff costs. If not, then the estimate could be somewhat higher.

The 2015 impact assessment for the review of the energy labelling Directive⁹² considered that:

“In general, the combined market surveillance activities of the Member States increased significantly between 2009 and 2013. This may be due to increased attention to this topic from the Commission, industry and NGOs, as well as from those market surveillance authorities already playing an active role. However, it is also necessary since the level of market surveillance started from a low base and the number of ecodesign and energy labelling regulations increased during those years.”

⁹⁰ P. Waide *et al.*, Enforcement of energy efficiency regulations for energy consuming equipment: findings from a new European study, Proceedings of the 6th International Conference EEDAL'11 Energy Efficiency in Domestic Appliances and Lighting.

⁹¹ SWD(2015) 139 final, IMPACT ASSESSMENT accompanying the document Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU.

In the absence of complete and relevant ‘hard’ data, the perception (shared by MSAs representative themselves in informal settings) is that the resources dedicated to market surveillance are still largely insufficient to tackle the large amount of ecodesign and energy labelling regulations and their complexity.

Level of compliance

Data on compliance levels also suffer from shortcomings. In 2015, it was estimated that on average, non-compliance rates found in market surveillance were about 15-35%, highlighting however that the non-compliance rates found by market surveillance authorities are probably not representative for the entire market, because authorities often use targeted checks. It concluded that the overall level of non-compliance of 20% estimated on the basis of the evaluation study was plausible⁹³.

The graph below produced by the ‘Kibana’ tool mentioned above (based on ICSMS data) shows that in 2020, nearly half of the encoded inspections related to a non-compliant product:

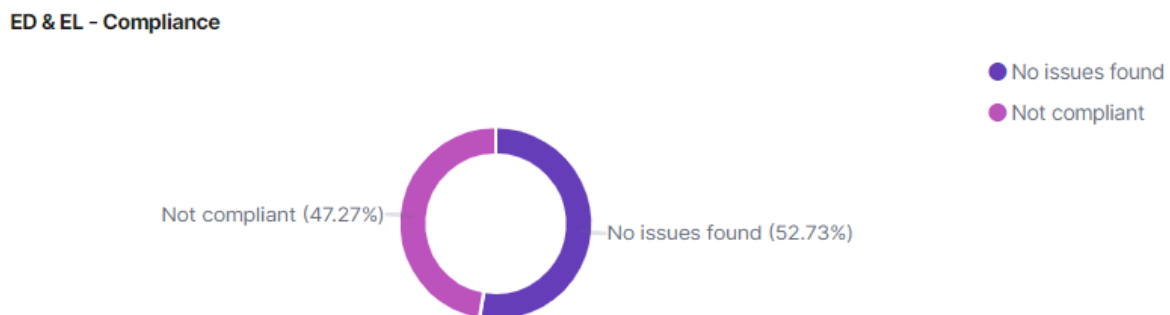


Figure 6 ED/EL Compliance rate

This is not in any way representative of the market situation, but reflects two cumulative biases:

- MSAs tend to encode inspections for non-compliant products more than for compliant ones (deemed more useful to be communicated to the other MSAs).
- MSAs follow a risk-based approach by which they tend to inspect products more likely to be non-compliant.

It has to be clarified that the term ‘non-compliance’ can cover very different realities: from minor non-compliance related to the format in which the mandatory information has to be presented (e.g. the number of digit after the comma), to products that grossly exceed the energy efficiency thresholds. In the first situation, the consumer is not harmed and the non-compliance can be easily corrected by voluntary action taken by the supplier (i.e. correcting the documentation), while in the second situation the consumer is harmed through excessive energy consumption and withdrawal of the product from the market is needed. There is of course a variety of situations between those two. It results that gross non-compliance rates are not very informative if they are not accompanied with more details showing the gravity of the issues at stake.

⁹³ SWD(2015) 139 final, IMPACT ASSESSMENT accompanying the document Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU.

Case study

To further document the issue of non-compliance, we choose a case study from the EU-funded EEPLIANT2 project⁹⁴, which ended in 2020. We analysed in particular the results of the inspection of 47 models of fridges under that project.

In first analysis, 60% of the tested models were considered non-compliant by MSAs⁹⁵:

- Not meeting the ecodesign energy efficiency requirements (Energy Efficiency Index (EEI) <42) : 11%⁹⁶
- Energy consumption greater than declared: 19% not compliant
- Storage volume smaller than declared : 14% not compliant
- Wrong energy class: 26% (associated with volume smaller than declared and/or energy consumption greater than declared)
- Incorrect Storage temperatures/climate class: 21% not compliant
- Freezing capacity: 54% not compliant
- Noise: 13% not compliant

In second analysis, the non-compliance rate went down to 40%, after giving economic operator the chance provide clarifications or to take voluntary action (e.g. change label/product fiche).

Because of the limited size of the sample, the figures should be taken with caution: they represent a plausible image of the situation, but uncertainty is significant.

The impact of the 11% fridges not meeting the required energy performance represents about 1,5 to 3 TWh missed energy savings in 2020, assuming that the samples taken for testing are representative of the market. In the discussions that followed the presentation of the results of the EEPLIANT2 project, the project participants were of the opinion that the figures were fairly representative of the market situation. Nevertheless, in the project report, the experts considered that a reduction factor of 30% should be applied because the samples selected were not necessarily fully representative of the market because of the application of risk-based sampling by the MSAs.

If this 30% factor is applied, the missed energy savings represent 1 to 2 TWh per year, corresponding to missed savings on household energy bills of about EUR 210 to 450 million per year. This represents about 7%-15% of the planned 12TWh energy savings for 2025. These figures can be seen as conservative, as they do not include the impact of the other non-compliances such as incorrect energy class, underestimated energy consumption etc. This is the same order of magnitude than the 10% energy loss pointed out in previous studies⁹⁷.

Even taking the 30% reduction factor, the high non-compliance rates for fridges, a product that is regulated since 1996, is striking. The situation for professional refrigeration, regulated only since 2015, also tested under EEPLIANT2, was worse. During the brainstorming event that followed the presentation of the project results in February 2020, two third of the participants considered that the results were alarming and serious, while one third considered that further analysis of the individual results was needed, in order also to better understand if they are really representative of the market.

⁹⁴ <https://eepliant.eu/index.php/new-about-eepliant/about-eepliant-2>

⁹⁵ These figures are calculated per model. The figures are higher when considering the individual units tested.

⁹⁶ Values are calculated after triple testing and application of the legal tolerances.

⁹⁷ Findings of the review study and impact assessment for the review of the ecodesign and energy labelling directives, 2010-2015.

Cooperation and European Commission support

Although the responsibility of market surveillance lies with the MSs, the European Commission is playing an important role in fostering cooperation between MSAs, ensuring coordination and providing support.

The new market surveillance Regulation (EU) 2019/1020, in force as of 01/07/2021 confers new powers to market surveillance authorities. Very importantly, it establishes the EU Product Compliance Network (EUPCN)⁹⁸, operational since 01/01/2021, where the European Commission, the MSs and the MSAs collaborate with the aim *“to structure the coordination and cooperation between market surveillance authorities in EU countries, and streamline market surveillance practices within the EU that facilitate the implementation of joint enforcement activities by member state authorities, such as joint investigations.”* Several activities, already initiated in 2019, are ongoing, and an ambitious work programme is under preparation, that will cover many aspects likely to raise the effectiveness of market surveillance in the EU.

At operational level, European cooperation on market surveillance takes place through informal groups of market surveillance authorities, called Administrative Cooperation Groups (ADCO)⁹⁹, also financed by the European Commission. Representatives of MSAs meet twice a year in the context of ecodesign and energy labelling with the view to exchange experience, discuss best practices, harmonise and improve approaches, organise collaboration etc. Thematic subgroups are formed on an ad-hoc basis to work on a specific issue and report to the group. The meetings are chaired by a Member State. Participation in the meetings has increased since the establishment of the groups; almost all Member States were present at the most recent meetings. Since 2021, the European Commission also finances a dedicated technical secretariat for the Ecodesign and Energy Labelling ADCOs.

After the successful EEPLIANT2 project mentioned above (and its predecessors "EEpliant"¹⁰⁰ and "Ecopliant"¹⁰¹), the European Commission is now funding the EEPLIANT3 concerted action¹⁰², with a budget of about EUR 6,9 million, which intends to have a transformational effect on ecodesign and energy labelling market surveillance. It combines ‘vertical’ work packages where a certain number of product groups are tested in laboratory with a series of ‘horizontal’ transformative work packages addressing issues such as development of IT tools, collaboration with customs, training, centres of excellence etc. These activities take place in close cooperation with the work of the EUPCN where related activities are also taking place.

In 2020-21, the European Commission has launched a tender for market surveillance campaigns ecodesign and energy labelling market, with an indicative budget of 2 millions.

Market surveillance collaboration is also enhanced through the development and improvement of the ICSMS database, as well as of the EPREL database, as mentioned above. The provision of ad-hoc guidance on the application of the legislation is also very much appreciated by MSAs and the concerned economic operators.

This is not meant to be an exhaustive list of all the all activities the European Commission is undertaking to support national market surveillance efforts. However, without also addressing the issue of resource mentioned above, these very much needed efforts are not likely to considerably reduce prevalence of non-compliance.

⁹⁸ https://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation_en/eu-product-compliance-network_en

⁹⁹ https://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation/administrative-cooperation-groups_en

¹⁰⁰ http://www.prosafe.org/images/Documents/EEPLIANT/EEPPLIANT_Press_release_v2.pdf

¹⁰¹ <http://www.ecopliant.eu/>

¹⁰² <https://eepliant.eu/index.php/new-about-eepliant/about-eepliant3>

MSAs, designated by the MSs, will verify the conformity of the products with the requirements laid down in the implementing measures and delegated acts. These can be done either on the product itself or by verifying the technical documentation. The rules on Union market surveillance and control of products entering the Union market are given in Regulation (EU) 2019/1020¹⁰³. Given the principle of free movement of goods, it is imperative that MS' market surveillance authorities cooperate with each other effectively.

ACHIEVEMENTS UNDER ECODESIGN AND ENERGY LABELLING

The European Commission regularly assesses the main results of the ecodesign and energy labelling framework, which are published under an Ecodesign Impact Accounting report.

Main results

The primary energy savings due to ecodesign and labelling measures are 1037 TWh in 2020 and 1533 TWh in 2030. This represents a saving of respectively 10% (2020) and 18% (2030) compared to the baseline based on business as usual (BAU). The savings are respectively 7% (2020) and 10% (2030) of the total EU27 primary energy consumption in 2019.

Due to the measures taken, the GHG emissions decrease by 170 Mt CO₂eq (-10% vs BAU) in 2020 and 266 Mt CO₂eq (-18% vs BAU) in 2030. The reduction is respectively 4.5% (2020) and 7% (2030) of the EU27 total emissions in 2018 (3764 Mt CO₂). Due to the measures for washing machines and dishwashers, in 2020 consumers save 1507 million m³ (> 50%) of (drinking) water (1885 Mm³ in 2030). The measures on imaging equipment (duplexing, N-print) save 0.23 million tonnes (15%) of graphic paper in 2020 and 0.15 Mt (15%) in 2030. The ecodesign regulation on welding equipment saves 82 kt (5%) of filler wire and electrodes in 2030.

The combined measures entail a EUR 60 billion (5%) saving in 2020 on consumer expenditure (EUR 76 billion energy cost saving, EUR 7 billion consumables saved, EUR 23 billion extra acquisition costs). In 2030 this increases to EUR 118 billion (9%). The consumer's monetary saving is 0.4% (in 2020) and 0.9% (in 2030) of the GDP of the European Union (EUR 13 300 billion in 2020).

Business revenues increase by EUR 21 billion in 2020 and EUR 29 billion in 2030 (5-6%), implying an increase of 324,000 direct jobs in 2020 and 430,000 in 2030.

Results per household

The average EU27 household in 2020:

- Bought 11 regulated products of which 4 light sources, 4 electronics products.
- Used 70 regulated products of which 30 light sources, 25 electronics products.
- Saved 1000 kWh (27%) of electricity and 700 kWh (6%) of fuel (gas, oil coal, wood) in 2020 compared to a scenario without Ecodesign and Labelling measures. In 2030 this is projected to increase to 1200 kWh electricity (33%) and 1400 kWh of fuel (12%).
- Avoided 530 kg CO₂eq of greenhouse gas emissions in 2020 compared a scenario without Ecodesign and Labelling measures. In 2030 this is projected to increase to almost 700 kg CO₂eq/household.

¹⁰³ Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011

- Saved EUR 210 (7%) in user expenditure in 2020, expected to increase to EUR 350 per year per household in 2030 (11%) compared to a scenario without Ecodesign and Labelling measures. This considers only the direct savings for products used in households. Additional financial benefits for households might arrive from the savings in the tertiary and industry sectors, if these are translated in lower tariffs, lower product prices, or higher wages.



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PART 3/4

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

**Proposal for a Regulation of the European Parliament and of the Council
establishing a framework for setting ecodesign requirements for sustainable products
and repealing Directive 2009/125/EC**

{COM(2022) 142 final} - {SEC(2022) 165 final} - {SWD(2022) 81 final} -
{SWD(2022) 83 final}

Annex 7: Problem Definition

Glossary

| Acronym | Definition |
|---------------------|--|
| ADCO | Administrative cooperation |
| BAT | Best available technology |
| BAU | Business as usual |
| BEV | Battery electric vehicles |
| BNAT | Best not yet available technology |
| CBM | Circular Business Model(s) |
| CEAP | Circular Economy Action Plan |
| CEI | Circular Electronics Initiative |
| CEN | European Committee on Standardization |
| CLP | Classification, Labelling and Packaging |
| CO ₂ | Carbon dioxide |
| CO ₂ -eq | Carbon dioxide-equivalents |
| CPR | Construction Products Regulation |
| CSRD | Corporate Sustainability Reporting Directive |
| CWP | Commission Work Programme |
| DKK | Danish Kroner |
| DMC | Domestic material consumption |
| DRC | Democratic Republic of the Congo |
| EAN | European Article Number |
| EAP | Environmental Action Plan |
| EBAE | European Business Awards for the Environment |
| ECA | European Court of Auditors |
| ECHA | European Chemicals Agency |
| ED | Ecodesign Directive |

| | |
|--------|---|
| EEA | European Environment Agency |
| EEB | European Environmental Bureau |
| EEE | Electrical and Electronic Equipment |
| EEl | Energy Efficiency Index |
| EEN | Enterprise Europe Network |
| EF | Environmental footprint |
| EIB | European Investment Bank |
| EIC | European Innovation Council |
| EIPRO | Environmental Impact of Products |
| EIT | European Institute of Innovation & Technology |
| ELV | End-of-life Vehicles |
| EMAS | Eco-Management and Audit Scheme |
| EP | European Parliament |
| EPR | Extended Producer Responsibility |
| EPREL | European Product Database for Energy Labelling |
| EREK | European Resource Efficiency Knowledge Centre |
| ETS | European Emissions Trading System |
| EU DPP | European Digital Product Passport |
| EUPCN | European Product Compliance Network |
| FTE | Full-time equivalent |
| GCI | Green Claims Initiative |
| GDP | Gross Domestic Product |
| GHG | Greenhouse gas |
| GPA | Government Procurement Agreement |
| GPP | Green Public Procurement |
| IA | Impact Assessment |
| ICSMS | Information and Communication System on Market Surveillance |
| ICT | Information and Communication Technologies |

| | |
|--------|--|
| IED | European Industrial Emissions Directive |
| ILO | International Labour Organisation |
| IO | Input-output |
| IPCC | Intergovernmental Panel on Climate Change |
| IPR | Intellectual Property Rights |
| ISG | Inter-service group |
| ISO | International Organization for Standardization |
| ISSG | Inter-Service Steering Group |
| IT | Information technology |
| JRC | Joint Research Centre |
| JUST | Directorate-General for Justice and Consumers |
| KIC | Knowledge and Innovation Communities |
| LCA | Life-cycle assessment |
| LCC | Life cycle costing |
| LCIA | Life cycle impact assessment |
| LLCC | Least Life Cycle Cost |
| LULUCF | Land use, land use change & forestry |
| MEERP | Methodology for ecodesign of energy-related products |
| MS | Member State |
| MSA | Market Surveillance Authorities |
| NGO | Non-government organisation |
| OECD | Organisation for Economic Co-operation and Development |
| OEF | Organisation Environmental Footprint |
| PB | Planetary boundaries |
| PEF | Product Environmental Footprint |
| PEFCR | Product Environmental Footprint Category Rules |
| PO | Policy option |
| PPWD | European Packaging and Packaging Waste Directive |

| | |
|-------|--|
| PRTR | European Pollutant Release and Transfer Register |
| PV | Photovoltaic |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals |
| REFIT | European Commission's regulatory fitness and performance programme |
| RSB | Regulatory Scrutiny Board |
| SCIP | Substances of Concern In Products |
| SCP | Sustainable consumption and production |
| SDG | Sustainable Development Goal |
| SIP | Sustainable Industrial Policy |
| SITRA | Finnish Innovation Fund |
| SKU | Stock Keeping Unit |
| SME | Small and medium-sized enterprise |
| SPI | Sustainable Product Initiative |
| SUP | Single-use plastic |
| SVHC | Substances of Very High Concern |
| TCO | Total Cost of Ownership |
| TFEU | Treaty on the Functioning of the European Union |
| TRIS | Technical Regulation Information System |
| UBA | Umweltbundesamt (German Environment Agency) |
| UK | United Kingdom |
| UN | United Nations |
| USB | Universal Serial Bus |
| VAT | Value-added tax |
| WEEE | Waste from Electrical and Electronic Equipment |
| WFD | Water Framework Directive |
| WTO | World Trade Organisation |

WHAT IS/ARE THE MAIN PROBLEM(S)?

The main problem: consumption and production are not sustainable and not adequately addressed by existing EU product and internal market rules, leading to increasingly divergent national rules on the sustainability of products

Despite the fact that there is no internationally agreed definition of a sustainable product, sustainable production and consumption¹ products in a sustainable manner is likely to involve²:

- minimal use of natural resources and toxic materials during the product’s production and use phase;
- minimal pollution and minimal generation of waste over the product’s life cycle;
- design allowing for products and product materials to be kept in use for as long as possible (the circularity element);
- production, use or end of life not negatively impacting on quality of life and human dignity (i.e. impacts on health, deterioration of social conditions, violation of human rights, including labour rights);
- Minimal compromise of a product’s functionality and safety as a result of the above³.

While there are some examples of products in the EU that meet such criteria⁴, many products do not. Moreover, evidence show that a large amount of imported goods are not compliant with chemical legislation⁵. Rather, evidence that **resources are still being used too inefficiently and that environmental impacts of the consumption of an average EU citizen are outside the safe operating space for humanity** for several impacts⁶, compounded by the fact that the **EU economy remains largely ‘linear’ by design**⁷, provides strong indication that current production, consumption and use of products is unsustainable.

According to latest UN projections, the global population could grow to around 8.5 billion in 2030 and 9.7 billion in 2050. The equivalent of almost three planets would be required to provide the natural resources needed to sustain current lifestyles⁸.

Despite the annual global extraction of materials being projected to grow at a slower pace than in the past (where extraction tripled between 1970 and 2017), it continues to grow⁹, posing a major environmental risk at global level. Natural resource extraction and processing generate about half of

¹ Consumption includes the use phase of products

² See for example: <https://sustainabledevelopment.un.org/topics/sustainableconsumptionandproduction>

³ Though this point is not included in the above-cited reference, it nevertheless follows naturally that products produced and consumed in a sustainable manner should remain fully functional and safe.

⁴ E.g. a leggings for children by ManyMonths (FI). Materials: 100% organic, GOTS-certified wool, Knee patches delaying wear at a vulnerable spot, foldable ends for adaptation to size growth, manufactured under good working conditions.

⁵ **REACH and CLP enforcement report**: up to **28%** of imports are not compliant with REACH and the Classification, Labelling and Packaging (CLP) Regulation, **CEFIC (European Chemical Industry Council) report 2020**: 80 % of non-compliant articles, containing banned or restricted chemicals comes from outside the EU/EEA , **Commission Communication on Chemicals Strategy for Sustainability Towards a Toxic-Free Environment** : almost 30% of the alerts on dangerous products on the market involve risks due to chemicals, with almost 90% of those products coming from outside the EU

⁶ Sala, S. et al., Indicators and Assessment of the Environmental Impact of EU Consumption, Joint Research Center Science for Policy Report 2 (2019); and Sala, S. and Sanye Mengual, E., Consumption Footprint: assessing the environmental impacts of EU consumption, European Commission, (2022), <https://publications.jrc.ec.europa.eu/repository/handle/JRC126257>

⁷ https://circulareconomy.europa.eu/platform/sites/default/files/circular_by_design_-_products_in_the_circular_economy.pdf

⁸ <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/>

⁹ OECD projects that global materials use will be more than double from 79 Gt in 2011 to 167 Gt in 2060. See <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf>

the total greenhouse gas (GHG) emissions and more than 90% of water stress and biodiversity loss¹⁰. As can be seen below, European trends in this respect are a cause for concern: if they persist in this way, the European Green Deal goals of reaching zero net emissions of greenhouse gases by 2050, and of decoupling economic growth from resource use, will become difficult to meet.

Decoupling economic growth from resource use¹¹

Decoupling economic growth from resource use occurs when resource use or pressures on the environment grow at a slower rate than the activity causing it (relative decoupling) or decline while the economic activity continues to grow (absolute decoupling). Absolute decoupling in high-income countries like EU Member States can lower average resource consumption, and maintain a high quality of life. Figure 1 links EU GDP with Domestic Material Consumption (DMC)¹².

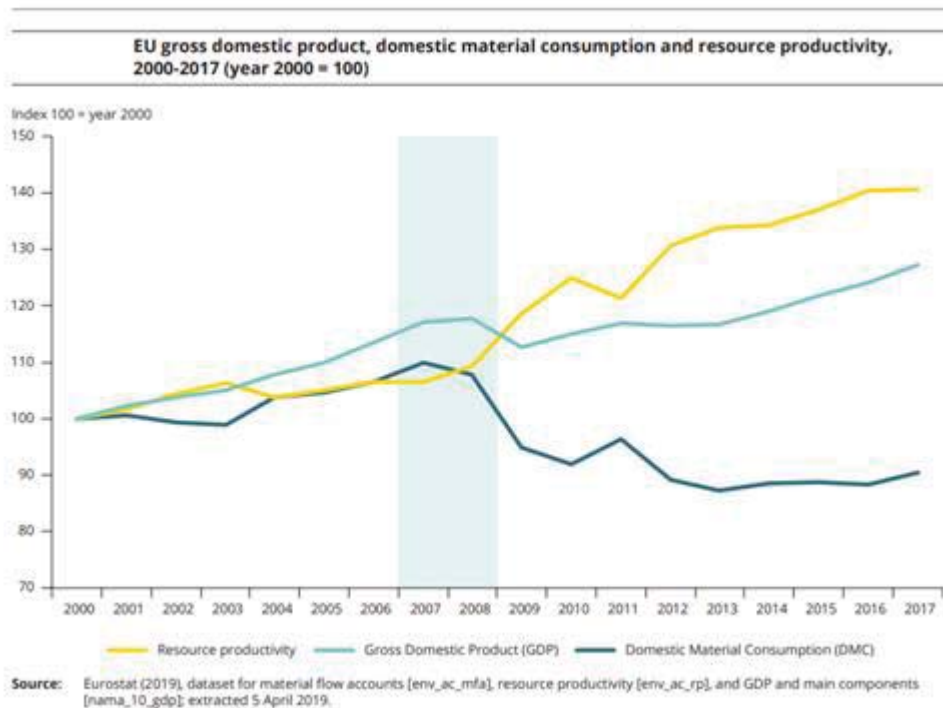


Figure 1 EU Gross Domestic Product, domestic material consumption and resource productivity

In the 2000 – 2017 period, EU GDP grew by 18 %, while DMC declined by 12 %. This means that the EU economy has done more with less, in other words an absolute decoupling of economic growth from resource use. However, **a closer look tells a different story**: the economic crisis of 2007/2008 (marked by the blue bar) significantly influenced the trend. Between 2000 and 2007, total DMC for the EU increased by 10 % and GDP grew by 17 %, resulting in a 7 % growth in resource productivity (the ratio of GDP to DMC). **In this period, the use of resources and economic growth went hand in hand, corresponding to the long-term historical trend.**

After 2008, the use of materials declined rapidly, with a 17 % decrease in total DMC between 2007 and 2017, due to the sharp decline in key sectors, in particular construction. Meanwhile, after a sharp fall in GDP in 2008/2009, it rebounded, reaching the same pre-crisis level by 2013. The result is that

¹⁰ [Global Resources Outlook 2019: Natural Resources for the Future We Want: The International Resource Panel.](#)

¹¹ As set out in the introduction, this features amongst the six the priorities of the Commission’s proposal for the 8th Environmental Action Plan, https://ec.europa.eu/environment/strategy/environment-action-programme-2030_en

¹² DMC measures of the materials consumed in an economy. It does not include the environmental impacts linked to consumption of those materials, but it can be consider a proxy for the pressures generated by their consumption.

resource productivity went up from 2007 to 2013, a period of absolute decoupling. Since 2013, the use of material resources in the EU has been increasing again (4 % in 2013-2017), outpaced by the increase in GDP (9 %). As a result, the resource productivity continued to increase, entering a phase of relative decoupling¹³.

Beyond resources decoupling, a JRC study¹⁴ analysed **environmental decoupling** by assessing the trends of the environmental impacts of domestic production and consumption, and of consumption activities (considering also traded goods) (see Figure 2). While considering only DMC regarding resource extraction might lead to a conclusion of positive effects along time, this would reflect **only a partial perspective on environmental impacts trends**, which can be more comprehensively evaluated in the domestic footprint and consumption footprint indicators.

While domestic activities showed absolute decoupling along the considered timeframe, consumption decoupling is not happening because of the large environmental impacts associated to trade (with higher relevance of imports compared to exports). **This highlighted the EU as a net importer of embedded environmental impacts in traded goods.** Moreover, as shown below, despite the fact that decoupling is occurring in relation to EU domestic production (resources use and emissions to the environment), this is not enough to remain within planetary boundaries, which are transgressed by up to 10 times (e.g. for climate change).

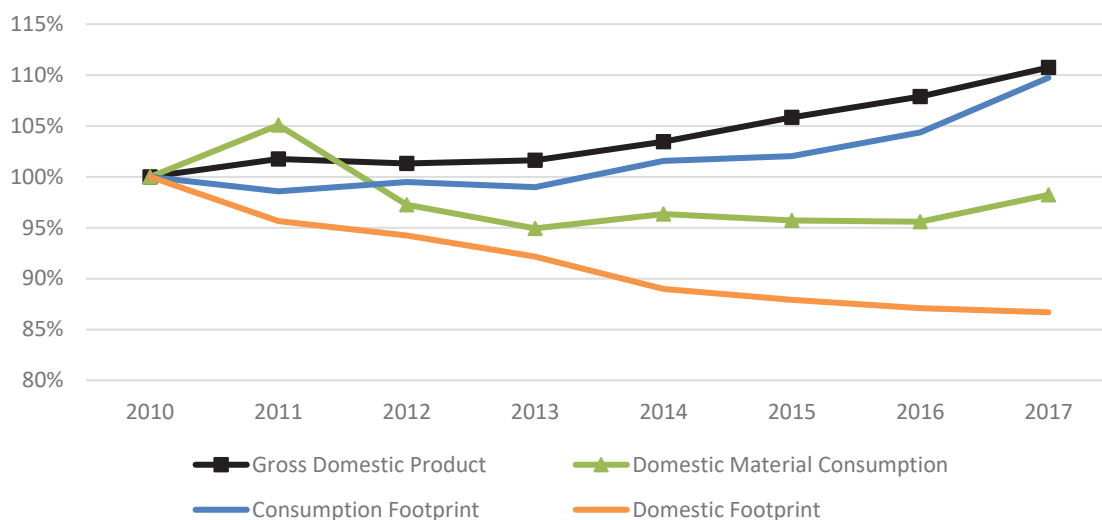


Figure 2 Environmental impacts of EU domestic activities (Domestic Footprint) and consumption (Consumption Footprint) for the period 2010-2017, compared to GDP and DMC

The **Domestic Footprint** is a life cycle assessment-based indicator that evaluates the environmental impacts of EU domestic activities by compiling statistical data on resource extraction and emissions to the environment in EU countries, for goods produced in the EU. The indicator is evaluated with the Environmental Footprint method which includes 16 impact categories¹⁵, which can be normalized and weighted into a single score. The evaluation of the Domestic Footprint as a single score showed an absolute decoupling, where environmental impact is decreasing while economic growth keeps increasing (Figure 2). However, it is important to assess environmental decoupling extending to all the impact categories. In this case, it is possible to observe the diverse behaviour of different

¹³ EEA, Resource efficiency and the circular economy in Europe 2019 — even more from less.

¹⁴ Sanyé-Mengual, E., Secchi, M., Corrado, S., Beylot, A., & Sala, S. (2019). Assessing the decoupling of economic growth from environmental impacts in the European Union: A consumption-based approach. *Journal of cleaner production*, 236, 117535.

¹⁵ Human toxicity, cancer; Human toxicity, non-cancer; Particulate matter; Photochemical ozone formation; Ionising radiation; Water use; Ecotoxicity, freshwater; Climate change; Resource use, fossils; Ozone depletion; Eutrophication, marine; Eutrophication, freshwater; Land use; Eutrophication, terrestrial; Acidification; Resource use, mineral and metals.

environmental issues (Figure 3) over the period 2000-2018. For example, when compared to GDP trend, climate change impact shows an absolute decoupling with a decreasing trend along time. However, climate change impact cannot be considered a proxy for the other categories, since some of them showed a relative decoupling and increased trend (such as land use or mineral resource depletion), while others (such as ozone depletion or acidification) presented a larger degree of absolute decoupling over time.

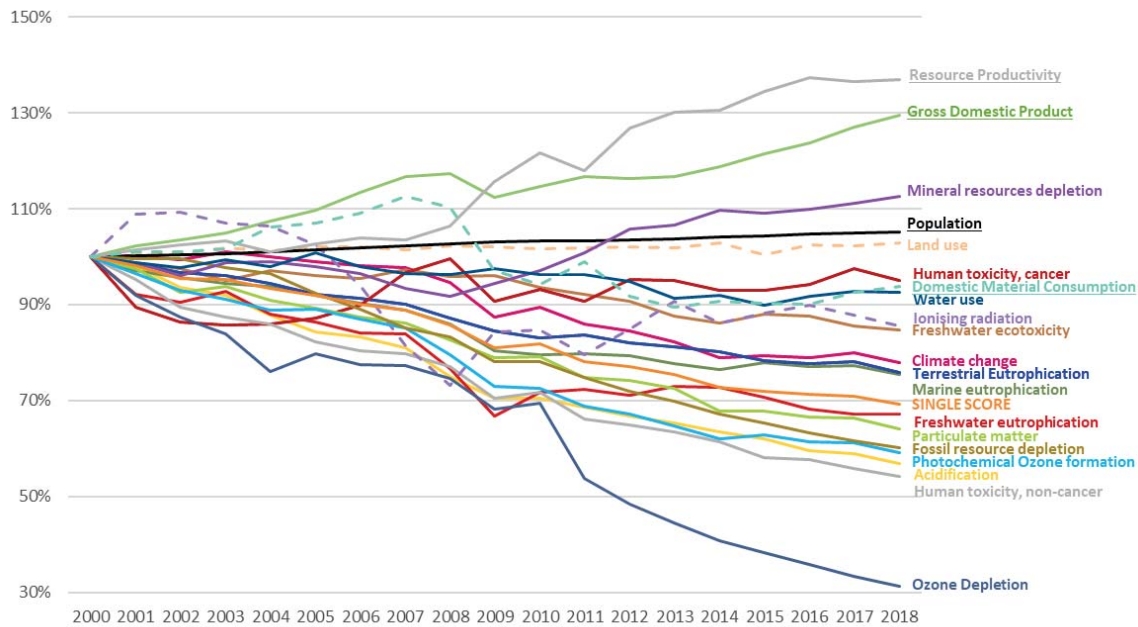


Figure 3 Environmental of EU domestic footprint time, compared to population, GDP, DMC and resource productivity^{16,17}

Note: Results for 2000 are reported as 100%, and results for the other years are rescaled accordingly.

Despite the fact that decoupling is observed when domestic impacts are analysed, the product related supply chains are affecting the environment beyond EU country boundaries. Hence, a production perspective should be compared with a consumption perspective, so as to take account of the entire supply chain within and beyond EU.

The domestic footprint could be then compared to a consumption footprint. The **Consumption Footprint** is a life cycle assessment-based indicator that evaluates the environmental impacts of EU consumption by assessing five areas of consumption, namely food, mobility, housing, household goods and appliances. When presented as single score, the consumption footprint is showing a relative decoupling from GDP, this means the consumption footprint is increasing at a slower pace than the economic growth (GDP), differently from the slight decrease of DMC (absolute decoupling) (Figure 4). As for the Domestic Footprint, the assessment of the individual impact categories show different patterns and intensity of decoupling along the assessed period. **For almost all the impact categories, decoupling is not occurring.** Due to delocalisation of production of a number of goods, increasing import, increasing international transport etc., there are categories with relevant impact increase (e.g.

¹⁶ Sala S., Beylot A., Corrado S., Crenna E., Sanyé-Mengual E, Secchi M. (2019) *Indicators and Assessment of the environmental impact of EU consumption. Consumption and Consumer Footprint for assessing and monitoring EU policies with Life Cycle Assessment*, Luxembourg: Publications Office of the European Union, ISBN 978-92-79-99672-6, doi:10.2760/403263

¹⁷ Sanyé Mengual, E; Tosches, D; Sala, S, (2021), *Domestic Footprint of the EU and Member States: methodology and 2010-2018 results*, Luxembourg: Publications Office of the European Union.

ozone depletion, mainly due to international cold chains transport; land use, due to increase of bio-based materials as input to different sectors, including textile, furniture etc.)

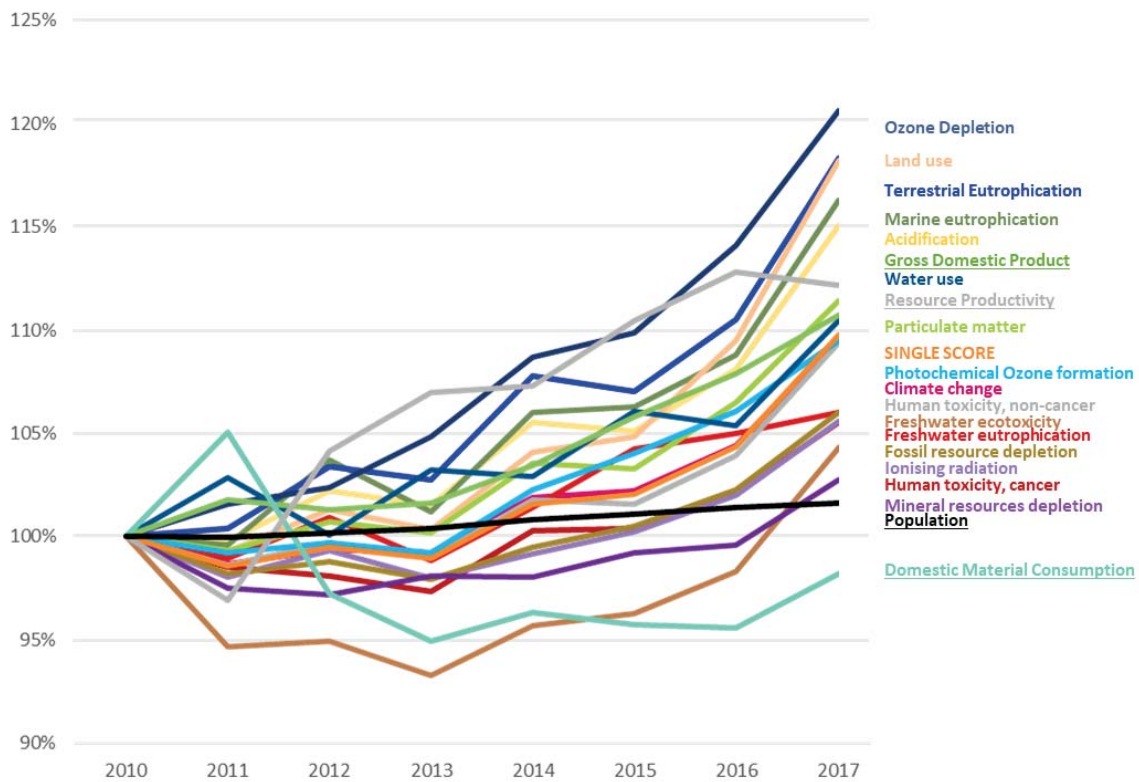


Figure 4: Environmental impacts of EU consumption footprint along time, compared to population, GDP, DMC and resource productivity¹⁸

Given the relevance of traded goods, another JRC study has focused on the **environmental footprint of traded goods**¹⁹, illustrating the main contributors of impacts (Figure 5) and the fact that the impacts of import and export showed an overall increase along the timeframe evaluated although at a different pace.

¹⁸Consumption Footprint Platform: <https://eplca.jrc.ec.europa.eu/ConsumptionFootprintPlatform.html>

¹⁹ Corrado, S., Rydberg, T., Oliveira, F., Cerutti, A., & Sala, S. (2020). Out of sight out of mind? A life cycle-based environmental assessment of goods traded by the European Union. *Journal of cleaner production*, 246, 118954.

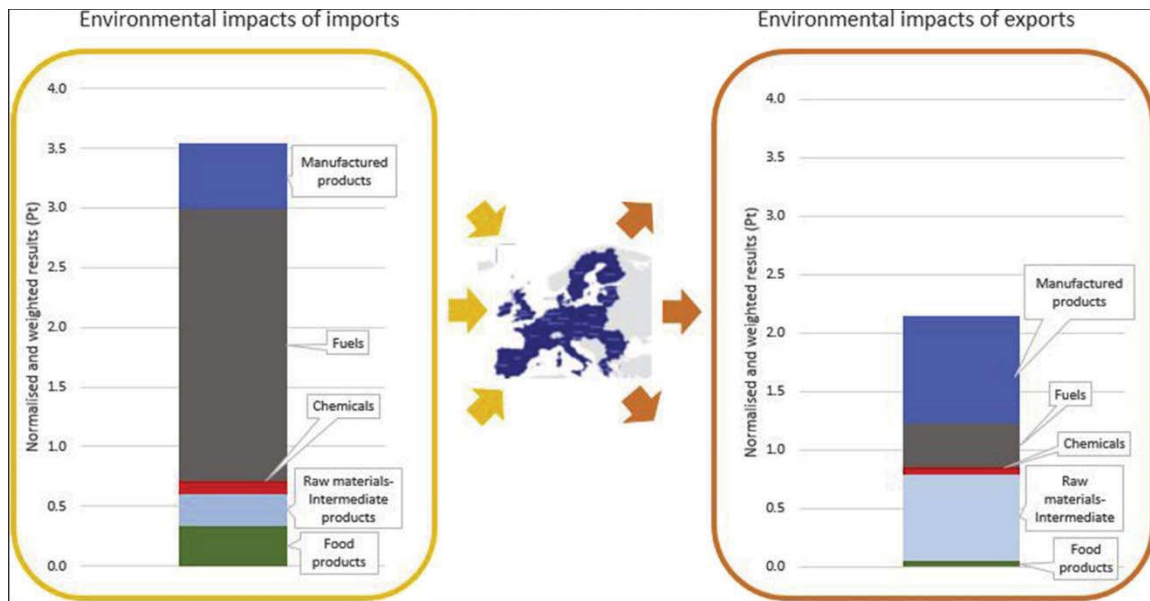


Figure 5: Impact index of import and export by type of products

This is confirmed as well when comparing LCA-based, and input output-based results²⁰ (Figure 6), where there is an increased impact of trade in almost all the impact categories.

²⁰ Beylot, A., Corrado, S., & Sala, S. (2020). Environmental impacts of European trade: interpreting results of process-based LCA and environmentally extended input-output analysis towards hotspot identification. *The International Journal of Life Cycle Assessment*, 25, 2432–2450.

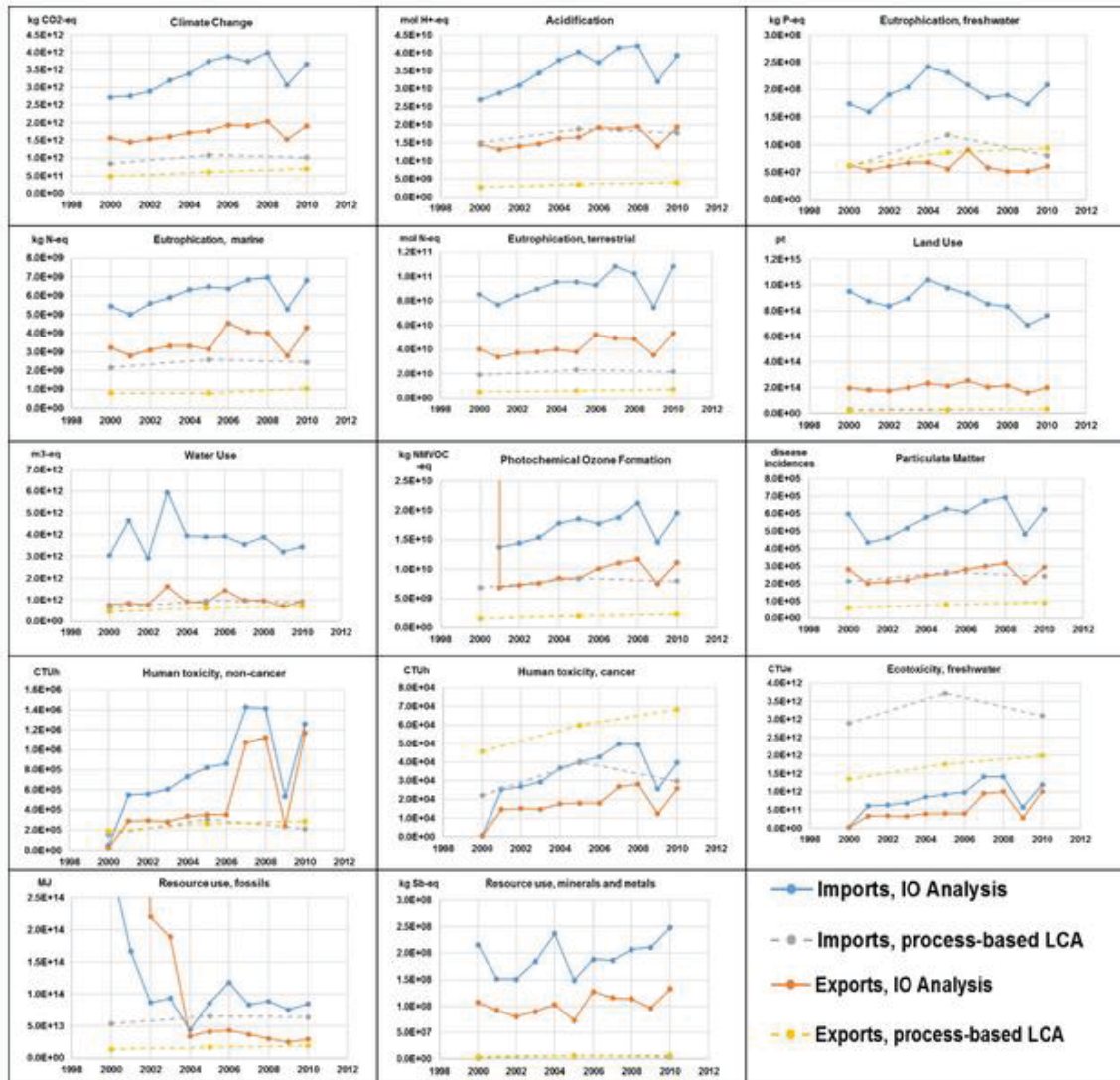


Figure 6: Environmental impacts of EU trade considering Input-Output (IO) analysis (referring to years from 2000 to 2010) and process-based LCA (years 2000, 2005, and 2010), distinguishing 14 impact categories

In Figure 6, the impacts of import and export showed an overall increase along the timeframe evaluated, which is confirmed for both process-based LCA and input output-based results²¹. There is an increased impact of trade in almost all the impact categories, although at a different pace. This means that impact categories associated with the product groups with the largest presence in imports and exports are more sensitive to changes in trade trends. For example, the economic crisis of 2008 led to a decrease in trade in the following years, and this affected some impact categories (e.g. freshwater ecotoxicity) more drastically than others (e.g. water use).

²¹ Beylot, A., Corrado, S., & Sala, S. (2020). Environmental impacts of European trade: interpreting results of process-based LCA and environmentally extended input–output analysis towards hotspot identification. *The International Journal of Life Cycle Assessment*, 25, 2432–2450.

Whereas in general a decoupling of resources use and economic growth is envisaged, in some cases the boosting of highly innovative and sustainable technologies could cause an increase and potential dependency on certain materials. This is the case of Critical Raw Materials (CRMs)²² that are essential to the functioning and integrity of a wide range of industrial ecosystems and for whose supply the EU is largely relying on imports²³. For example, renewable energy technologies or high-tech applications depend on the availability of a number of CRMs (such as rare earths, gallium, or indium), which are mainly mined outside the EU²⁴.

EU Consumption and Planetary Boundaries

As seen above, decoupling is occurring in some impact categories at domestic level, and not occurring at consumption level. However, decoupling is not enough to ensure that production and consumption are within ecological boundaries. The planetary boundaries (PBs) is a concept addressing Earth system processes which are affected by environmental boundaries in order to define a "safe operating space for humanity", as a precondition to achieve sustainable development. It is based on scientific evidence that human actions since the Industrial Revolution have become the main driver of global environmental change and that ecosystems' carrying capacity is limited. According to the paradigm, "transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental-scale to planetary-scale systems"²⁵. In a recent study carried out by JRC²⁶, the impacts of production and consumption of the EU were assessed by means of life cycle assessment (LCA)-based indicators and compared with the PBs, addressing the 16 environmental impact categories used in the life cycle impact assessment (LCIA) of the EU Environmental Footprint. When assessing the overall environmental impacts of EU consumption compared to the global LCIA-based PBs, impacts of EU consumption related to **climate change**²⁷, **particulate matter**²⁸, and **fossil and mineral resources**²⁹ were close to transgressing or had already transgressed the global boundaries. However, in all the other impact categories a negative environmental impact is occurring, and therefore these should also be addressed. The EU, with less than 10% of the world population, was close to transgress the global ecological limits for these impacts. Moreover, when downscaling the global PBs and comparing the impacts per capita for an average EU citizen, the LCIA-PBs were significantly transgressed in many impact categories by up to 8 times the boundary (see Figure 7). The results of this study are helpful in defining the magnitude of the problem and the efforts needed to reduce the impacts of EU consumption.

²² Economic importance and supply risk are the main factors for the assessment of CRMs. (for further details see https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en).

²³ COM(2020) 474 final

²⁴ Raw Materials Scoreboard 2020, <https://op.europa.eu/s/pita>.

²⁵ <https://www.stockholmresilience.org/research/planetary-boundaries.html>

²⁶ Sala, S., Crenna, E., Secchi, M., & Sanyé-Mengual, E. (2020). Environmental sustainability of European production and consumption assessed against planetary boundaries. *Journal of environmental management*, 269, 110686.

²⁷ Staying within a climate change planetary boundary (such as the Paris Agreement goal of limiting global warming to well below 2°C and pursuing efforts to limit the increase to 1.5°C) requires reducing CO₂ emissions to net zero globally, and achieving declining net non-CO₂ radiative forcing. In pursuit of this, the European Climate Law has set the objective of balancing greenhouse gas emissions and removals in the EU regulated in Union law at the latest by 2050.

²⁸ This refers to adverse impacts on human health caused by emissions of Particulate Matter (PM) and its precursors (e.g. NO_x, SO₂). Usually, the smaller the particles, the more dangerous they are, as they can go deeper into the lungs. The potential impact of is measured as the change in mortality due to PM emissions, expressed as disease incidence per kg of PM_{2.5} emitted.

²⁹ The amount of fossil resources or mineral (e.g. metals) use for the production and the consumption of goods

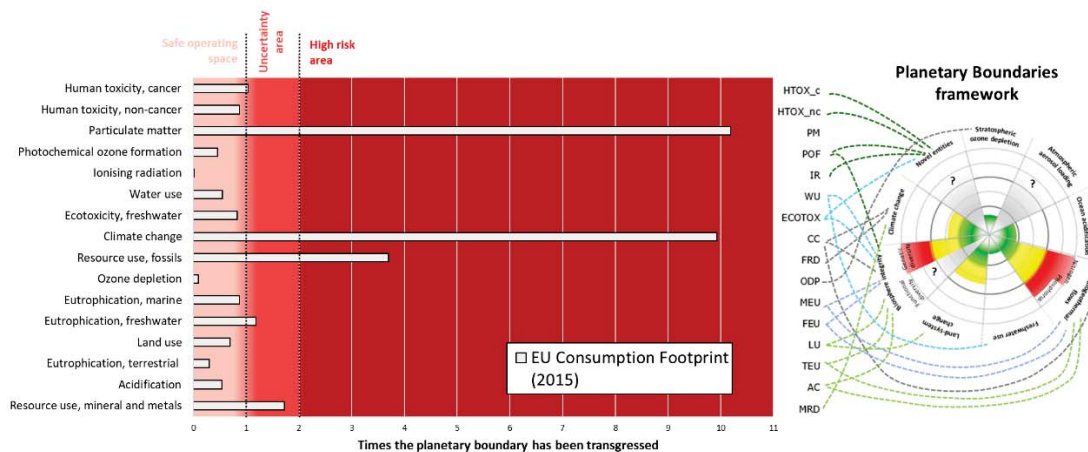


Figure 7: Assessment against the Planetary Boundaries of the EU Consumption Footprint (2015). Updated results based on the JRC study³⁰, showing per capita impacts of EU consumption.

The overall impacts of EU consumption can be also broken down to the contribution of the different areas of consumption. Taking into account the impact categories for which the impacts were more prominent in Figure 7, it is possible to see the role of appliances, household goods and mobility (Figure 8). For example, for particulate matter and GHG emissions, housing, household goods and mobility are transgressing the planetary boundaries.

This granularity enable us to identify the areas with a larger role in these environmental impact categories. The areas of housing³¹, mobility³², household goods³³ and appliances³⁴ have a different role depending on the impact category. On an individual level, most of them are already transgressing the planetary boundary (safe operating space)³⁵. This illustrates the need to expand the scope of environmental impact reductions to all of these sectors, each of which is already generating unsustainable impacts.

³⁰ Sala, S., Crenna, E., Secchi, M., & Sanyé-Mengual, E. (2020). Environmental sustainability of European production and consumption assessed against planetary boundaries. *Journal of environmental management*, 269, 110686.

³¹ Housing includes not only the household infrastructure (from raw materials extraction to end of life management) but also water and energy consumption during the use phase.

³² Mobility includes vehicles structure and use (incl. fuel production and consumption) associated to private and public transport

³³ Household goods include several product groups: detergents, personal care, sanitary products, furniture, footwear, clothes, bed mattresses, paper products, and plastic products.

³⁴ Appliances include different product groups: refrigeration, dishwashing, washing, electronics, lighting, air conditioning, domestic cooking appliances, cleaning appliances, and bathroom appliances. Note that the area of consumption of appliances covers partially the entire appliances market.

³⁵ The remaining impact of the consumption footprint is associated to food consumption, which is beyond the SPI scope.

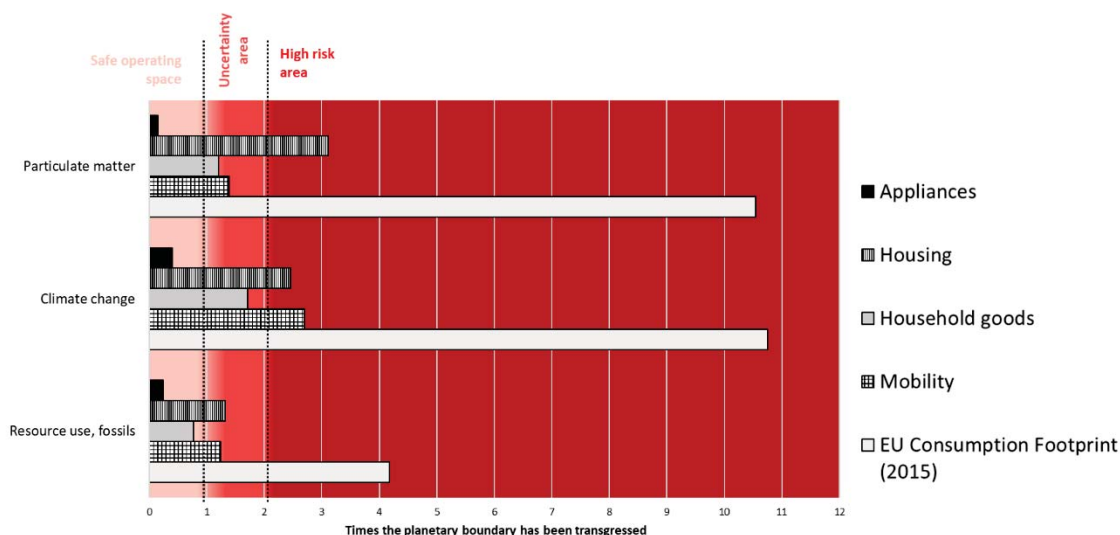


Figure 8: Assessment against the Planetary Boundaries (PB) regarding climate change, particulate matter and fossil resource use of the EU Consumption Footprint (2015) and associated areas of consumption

Results represent the impact of an average EU citizen compared with the PB per capita which are reported as dotted lines, where bars represent the impact per capita as the number of times of each specific PB.

The EU economy is still too “linear”³⁶

The EU’s industry has started the shift toward the green transition. Nevertheless, it still accounts for 20% of the EU’s greenhouse gas emissions³⁷. It remains too ‘linear’, and dependent on a throughput of new materials extracted, traded and processed into goods, and treated as waste. The overall level of circularity is limited, as illustrated in Figure 9, referring to the overall material flows in the economy in 2017.

³⁶ As set out in the introduction, accelerating the transition to a circular economy features amongst the six the priorities of the Commission’s proposal for the 8th Environmental Action Plan, https://ec.europa.eu/environment/strategy/environment-action-programme-2030_en

³⁷ COM (2019), 640 final, p. 7.

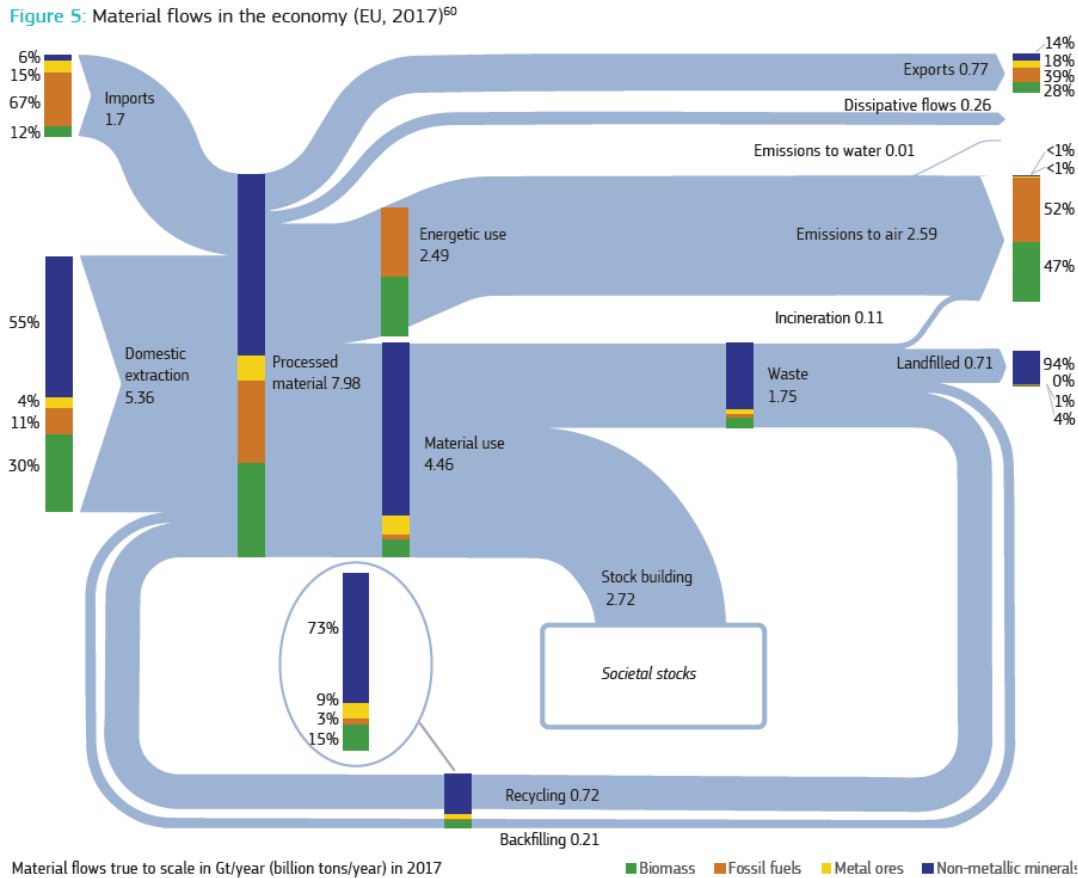


Figure 9: Material flow in the economy (EU, 2017)

Source: JRC analysis based on data provided by EUROSTAT on the circular economy material flows³⁸.

One important indicator gauging the level of circularity of the EU economy is the **circular material use rate**, which measures the share of material recovered and fed back into the economy - thus saving extraction of primary raw materials - in overall material use. It is defined as the ratio of the circular use of materials to the overall material use. The overall material use is measured by summing up the aggregate domestic material consumption (DMC) and the circular use of materials. The circular use of materials is approximated by the amount of waste recycled in domestic recovery plants minus imported waste destined for recovery plus exported waste destined for recovery abroad. A higher circularity rate value means that more secondary materials substitute for primary raw materials, thus reducing the environmental impacts of extracting primary material. As Figure 10 shows, the circular material use rate has been constantly growing (but at a very slow pace) from 8.2 in 2004 to 11.8 in 2019³⁹. In terms of demand for recycled materials, Eurostat data for the years 2010-2018⁴⁰ show that although 7.85 billion tonnes of materials were processed, only 0.7 billion tonnes (i.e. 9.5%) of this were from recycled materials. In addition, there are stark differences in the share of market demand met by secondary materials: while in the cases of lead and copper, 75% and 55% of demand

³⁸ EC, 2021. European Commission, EIP on Raw Materials, Raw Materials Scoreboard 2021. DG Grow report. Luxembourg : Publications Office of the European Union, ISBN 978-92-76-23795-2 doi:10.2873/567799

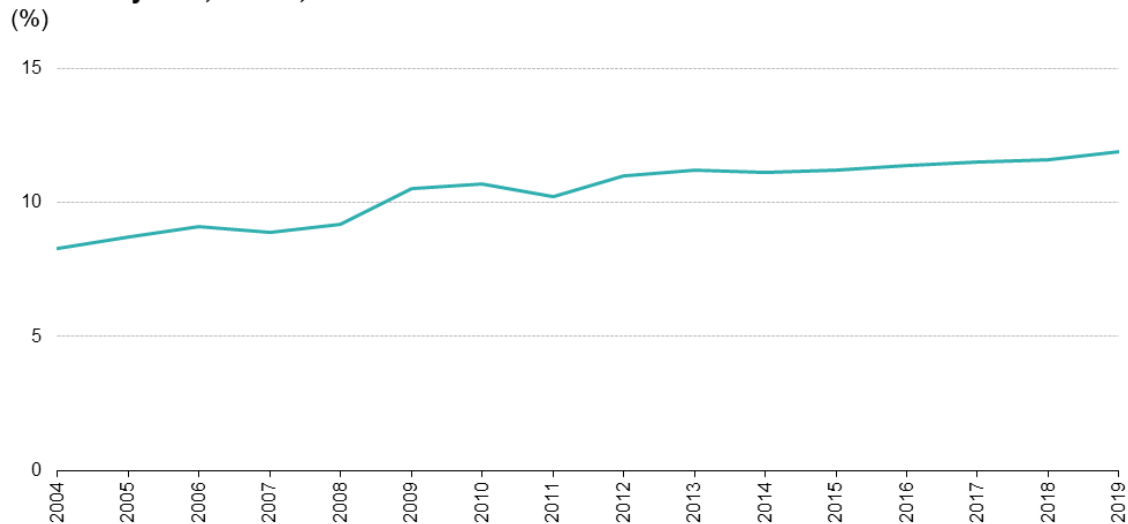
³⁹ https://ec.europa.eu/eurostat/databrowser/view/cei_srm030/default/line?lang=en

⁴⁰ Eurostat Experimental Sankey Diagrams of material flows for the years 2010-2018; Eurostat (2018) Material Flow diagram for the EU-27 2018

respectively is covered by secondary materials, for plastics it is only 6%⁴¹ (of which only 2% is represented by single-use plastics⁴²), and for materials such as indium⁴³, used in the touchscreens of smartphones, it is well under 10%.

It is fair to say that at present the EU economy is still far from being circular and progress towards this goal remains slow. The European recycling industry has repeatedly pointed to the need to boost the market for secondary raw materials (including by stimulating the demand through incentives such as mandatory recycled content measures or green public procurement)⁴⁴ and to combat reluctance and misperceptions on the part of producers as to its reliability and quality potential.

Circularity rate, EU-27, 2004-2019



Source: Eurostat (online data code: env_ac_cur)

eurostat

Figure 10: Circularity rate, EU-27, 2004-2019

Other studies show that over the whole life cycle of the products, **the use of resources is often suboptimal**⁴⁵. Many products have characteristics that do not allow resource saving (e.g. energy and water) during their use and value retention activities at the end of their life, meaning that most products are discarded and their materials not sufficiently recycled, causing valuable resources to be wasted, including critical raw materials⁴⁶. For instance, at the scale of the whole EU economy, the recycling rate of all waste excluding major mineral waste reached only 56% in 2016⁴⁷, so that conversely 44% of all the materials contained in waste is lost.⁴⁸ This performance indicator grows only very slowly (the EU recycling rate had already reached 54% in 2010, meaning a gain of only 2

⁴¹ A European Strategy for Plastics in a Circular Economy, COM(2018) 28 final

⁴² <https://www.minderoo.org/plastic-waste-makers-index/>

⁴³ Foresight on Critical Raw Materials for European Industry, March 2020, https://ec.europa.eu/info/sites/default/files/foresight_newsletters_collection_online_2020.pdf

⁴⁴ See for example joint open statement of EuRIC, FEAD and CEWEP, <https://www.euric-aisbl.eu/position-papers/item/377-joint-open-letter-of-euric-fead-and-cewep-for-a-green-recovery>

⁴⁵ See for example: www.eea.europa.eu/publications/circular-by-design or www.ellenmacarthurfoundation.org/publications/achieving-growth-within

⁴⁶ Report on Critical Raw Materials and the Circular Economy - Commission Staff Working Document SWD(2018) 36 final.

⁴⁷ Last available data. Eurostat: Recycling rate of all waste excluding major mineral waste [CEI_WM010] https://ec.europa.eu/eurostat/databrowser/view/cei_wm010

⁴⁸ Eurostat “Recycling rate of all waste excluding major mineral waste” [cei_wm010]

percentage points in 6 years), with large differences between Member States (from 10% in Estonia to 80% in Slovenia). Even for precious metals such as gold, a study in Germany and the United States reported that 90 % of the gold contained in mobile phones is dispersed and hence lost during the shredding taking place at the start of the recycling process⁴⁹. This situation generates environmental impacts both in and outside the EU as well as unnecessary costs for industries. If we take the example of aluminium, using recycling scrap can save about 95% of the energy required to produce primary aluminium. This reduces processing and logistic costs as well as other important environmental impacts generated by both the mining of bauxite and transport between extraction, processing and fabrication.

Energy

The production and use of energy across economic sectors account for more than 75% of the EU's greenhouse gas emissions⁵⁰. The global figure is 73% worldwide⁵¹. More than 43%⁵² of the EU greenhouse gas emissions is due to energy used by products when consumed. However, even more energy is used for the production of these products (i.e. 'grey energy' or embedded energy) both in the EU and in the rest of the world, making products accountable for an even larger share of greenhouse gas emissions. Consequently, tackling the energy used for products is crucial for reducing greenhouse gas emissions in the short and medium term. Even in the long term perspective of 'green and carbon-free' energy, mastering the energy use, energy content and energy efficiency of products will remain essential in order to avoid creating undue supplementary energy demand that would have to be compensated by additional renewable energy sources. This would involve the use of even more products⁵³ (and therefore additional environmental impacts), or the (temporary) use of less clean source of energy.

Life-cycle social impacts of EU consumption

Products, including those consumed in the European Union, can be produced under conditions that violate one or several of the 8 Fundamental Conventions of the International Labour Organisation (ILO)⁵⁴, which address child labour, forced labour, freedom of association, the right to organise, collective bargaining, equal remuneration and discrimination.

These violations can take place along the global chain supplying the products sold on the EU Internal Market. In fact, social risks (of all natures) related to consumption of goods in the EU are heavily concentrated in the extra-EU part of the value chains that supply these goods: based on a social LCA

⁴⁹ Lee, H., Sundin, E. and Nasr, N., 2012, 'Review of end-of-life- management issues in sustainable electronic products', in: Sustainable Manufacturing, Springer.

⁵⁰ The European Green Deal, COM(2019) 640 final

⁵¹ Our World in Data, Emissions by sector <https://ourworldindata.org/emissions-by-sector>

⁵² Data from the Ecodesign Impact accounting (https://ec.europa.eu/energy/studies/ecodesign-impact-accounting-0_en?redir=1) and Eurostat (Eurostat Energy Balance nrg_bal_c, ed. February 2021) suggest that the products covered by Ecodesign, Energy Label, Energy Star (until it expired) and Tyre Label represented 57% of the total EU primary energy consumption, which itself is linked to 75% of the greenhouse gas emissions in the EU (The European Green Deal, COM(2019) 640 final). When adding non regulated products (either outside the scope, or with no implementing measures) that share will be even greater.

⁵³ energy production and storage products like PV panels, wind turbines, batteries and potentially products and materials for grid expansion and reinforcement

⁵⁴ The 8 Fundamental Conventions of the ILO are:

[Freedom of Association and Protection of the Right to Organise Convention, 1948 \(No. 87\)](#)

[Right to Organise and Collective Bargaining Convention, 1949 \(No. 98\)](#)

[Forced Labour Convention, 1930 \(No. 29\)](#) (and its 2014 Protocol)

[Abolition of Forced Labour Convention, 1957 \(No. 105\)](#)

[Minimum Age Convention, 1973 \(No. 138\)](#)

[Worst Forms of Child Labour Convention, 1999 \(No. 182\)](#)

[Equal Remuneration Convention, 1951 \(No. 100\)](#)

[Discrimination \(Employment and Occupation\) Convention, 1958 \(No. 111\)](#)

approach and on 2010 data, the majority of overall social risks in the 10 most impactful sectors are related to extra-EU trade⁵⁵, a large proportion of which are due to the occurrence of work-related injuries and fatalities (e.g. particularly in the garment sector⁵⁶). Worryingly, however, some violations are also taking place within EU borders.

Table 20 Top ten sectors for single-score social risk (by % contribution to overall social risk) attributable to EU-27 imports in 2010 from extra- and intra-territorial trading partners considering cradle-to-producer gate life cycle social risk scores

| | Extra- | Intra- | Total |
|------------------------------------|--------|--------|-------|
| Oil | 17 % | 0 % | 17 % |
| Crops n.e.c. | 8 % | 0 % | 8 % |
| Machinery and equipment n.e.c. | 5 % | 2 % | 7 % |
| Metals n.e.c. | 6 % | 1 % | 7 % |
| Chemical, rubber, plastic products | 4 % | 2 % | 6 % |
| Textiles | 5 % | 1 % | 6 % |
| Electronic equipment | 4 % | 1 % | 5 % |
| Wearing apparel | 4 % | 1 % | 4 % |
| Food products n.e.c. | 3 % | 1 % | 4 % |
| Minerals n.e.c. | 3 % | 0 % | 3 % |
| SUM | 58 % | 9 % | 67 % |

Global breaches of ILO conventions along supply chains

A 2021 report⁵⁷ of the ILO and Unicef on **child labour** indicates that the number of children in child labour rose to 160 million worldwide in 2020 (including 63 million girls and 97 million boys), an increase of 8.4 million children compared to 2016. This means that almost 1 child in 10 is affected worldwide. More worryingly, this report warns that these figures are rising again for the first time in 20 years after a continuous period of decline. The number of children aged 5 to 17 years in hazardous work – defined as work that is likely to harm their health, safety or morals – has risen by 6.5 million to 79 million since 2016 and represents close to 50% of the total number of children at work.⁵⁸ Between 28 and 43% of these child labourers contribute, directly or indirectly, to global supply chains.⁵⁹

The cases of the worst forms of child labour were found in sectors that correspond to those with a high risk of contemporary forms of slavery occurring in supply chains, including some directly or indirectly linked to the products likely to fall within the scope of this initiative, such as agriculture (i.e. farming of raw materials such as cotton), mining and quarrying, and garments and textiles.⁶⁰ In

⁵⁵ Pelletier, N., Ustaoglu, E., Benoit, C. et al. Social sustainability in trade and development policy. *Int J Life Cycle Assess* 23, 629–639 (2018). <https://doi.org/10.1007/s11367-016-1059-z> Table 1.B

⁵⁶ EC study on due diligence requirements through the supply chain, 2020, p. 215. In the past ten years, garment supply chains have seen horrific workplace accidents, such as the collapse of the Rana Plaza, <https://op.europa.eu/en/publication-detail/-/publication/8ba0a8fd-4c83-11ea-b8b7-01aa75ed71a1/language-en>

⁵⁷ International Labour Office and United Nations Children’s Fund, *Child Labour: Global estimates 2020, trends and the road forward*, ILO and UNICEF, New York, 2021. <https://data.unicef.org/wp-content/uploads/2021/06/Child-Labour-Report.pdf>

⁵⁸ International Labour Office and United Nations Children’s Fund, *Child Labour: Global estimates 2020, trends and the road forward*, ILO and UNICEF, New York, 2021. <https://data.unicef.org/wp-content/uploads/2021/06/Child-Labour-Report.pdf>

⁵⁹ Ending child labour, forced labour and human trafficking in global supply chains, ILO, OECD, IOM, UNICEF - Geneva, 2019. https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipecc/documents/publication/wcms_716930.pdf

⁶⁰ ILO, “Implementing the Roadmap for Achieving the Elimination of the Worst Forms of Child Labour by 2016: a training guide for policymakers” (2013), p. 9.

Africa tens of thousands of children are reported to work in open-pit mines supplying niobium and tantalum to the global electronics industry⁶¹.

A 2019 report of the ILO⁶² on **forced labour and modern slavery** states that in 2016, over 40.3 million people were in a situation of modern slavery, including 16 million people in forced labour exploitation in the private economy (15% of which were employed in the manufacturing sector). Contemporary forms of slavery have often been cited as occurring in global supply chains of international brands in the garment and footwear sector.⁶³ Forced labour in the manufacturing of electronic goods has also been the subject of recent research.⁶⁴ In the garment sector, recent reports of the use of forced labour of Uyghurs in the cotton production in Xinjiang have revealed great risks of human rights violations. The Xinjiang province in China is said to produce almost 20% of global cotton supplies⁶⁵.

There is evidence that several labour rights (e.g. **freedom of association, right to organise and to collectively bargain**) are undermined across the world. The yearly Global Rights Index by the International Trade Union Confederation⁶⁶ on labour and human rights showed that in 2020, 80% of countries (115 of 144 countries) violated the right to collectively bargain (up from 62.5% in 2014), 74% of countries (109 of 144) excluded workers from the right to establish or join a trade union (up from 58% in 2014), and hence the freedom of association and the right to organise. Similarly, the number of countries which impeded the registration of trade unions, increased from 86 in 2019 to 89 countries in 2020. These violations of labour rights take place in third countries, but also in the European Union.

In addition, areas affected by (armed) conflicts often have an increased risk of social and human rights violations, including the ILO conventions. It occurs that products destined for the EU market include materials, often including minerals, which are commonly sourced from such areas.⁶⁷

Despite growing international pressure for application of social codes of conduct throughout supply chains, an ILO survey⁶⁸ shows that working conditions are considered as selection criterion in only 36% of cases, whereas price is a criterion in 73% of cases and speed of delivery in 59% of cases (for example, a Eurostat survey of EU companies sourcing internationally⁶⁹ showed that their motivation lies, in 85% of cases, in reducing labour costs, and that the main reason EU businesses moved functions abroad between 2014 and 2016 or between 2015 and 2017 was to cut labour and other costs). In addition to these selection criteria, purchasing practices as they are currently designed and

⁶¹ B. Vivuya, Equal Times, 16 October 2020: “As incremental efforts to end child labour by 2025 persist, Congo’s child miners – exhausted and exploited – ask the world to “pray for us””, available at: <https://www.equaltimes.org/as-incremental-efforts-to-end#.YLTEOagzY2w>

⁶² United Nations General Assembly: “Current and emerging forms of slavery - Report of the Special Rapporteur on contemporary forms of slavery, including its causes and consequences”, July 2019, available at: https://www.un.org/en/ga/search/view_doc.asp?symbol=A/HRC/42/44

⁶³ See, for example, Centre for Research on Multinational Corporations and India Committee of the Netherlands, “Flawed Fabrics: the abuse of girls and women workers in the South Indian textile industry” (2014) (www.indianet.nl/FlawedFabrics.html); **Anti-Slavery International, “Slavery on the high street: forced labour in the manufacture of garments for international brands”** (2012) (www.antislavery.org/includes/documents/cm_docs/2012/s/1_slavery_on_the_high_street_june_2012_final.pdf).

⁶⁴ ILO referred to the response of a major United States electronics company to allegations of forced labour in factories in China in its publication *Combating Forced Labour: A Handbook for Employers & Business*, Good Practice Case Studies, Part 7 (2008), pp. 5–7. See also China Labor Watch, “Is Samsung Infringing Upon Apple’s Patent to Bully Workers?” (2012) (www.chinalaborwatch.org/upfile/2012_9_4/Samsung%20Report%200904-v3.pdf) and “Beyond Foxconn: Deplorable Working Conditions Characterize Apple’s Entire Supply Chain” (2012) (www.chinalaborwatch.org/upfile/2012_8_13/2012627-5.pdf); and Verité, “Forced Labor in the Production of Electronic Goods in Malaysia: A Comprehensive Study of Scope and Characteristics” (2014) (www.verite.org/sites/default/files/images/VeriteForcedLaborMalaysianElectronics2014.pdf).

⁶⁵ “Xinjiang cotton sparks concern over ‘forced labour’ claims”. BBC, 13 November 2019, <https://www.bbc.com/news/business-50312010>

⁶⁶ International Trade Union Confederation, “2020 Global Rights Index”, 2020. https://www.ituc-csi.org/IMG/pdf/ituc_globalrightsindex_2020_en.pdf

⁶⁷ See information and documentation on **Conflict Affected and High-Risk Areas (CAHRAs)** (responsiblemineralsinitiative.org).

⁶⁸ ILO, “Purchasing practices and working conditions in global supply chains: Global Survey results - INWORK Issue Brief No.10”, June 2017, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_556336.pdf

⁶⁹ The motivation of EU-based companies for sourcing production internationally lies, in 85% of cases, in the reduction of labour costs, In: Eurostat Motivational factors important for enterprises sourcing internationally (2014-2017) https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_sourcing_and_relocation_of_business_functions

implemented consist, according to this ILO survey, in: (1) an absence of written contracts, in 36% of cases; (2) a lack of specification of working conditions in 59% of cases; (3) insufficient lead times more than 30% of the time for 41% of respondents; (4) exerting market power, with the main customer taking over more than 50% of production in 24% of cases, to force taking up unrealistically challenging price and lead time.

The **example of textiles** is a case in point for illustrating how the above-mentioned risks, where the prevalence of highly competitive, mostly linear business models in the sector — both inside and outside Europe — can have detrimental social and human rights impacts, including poor rates of pay, poor working conditions and poor working environments in textile factories⁷⁰. A study reports that the EU consumption of clothing, textiles and leather products have contributed in 2015 to around 375 fatal accidents and 21,000 non-fatal accidents due to poor working conditions in supply chains outside the EU⁷¹. Indeed, more than 70% of the textiles and clothing imported into the EU originate from third countries/regions⁷² – in some of which clear breaches of worker rights have emerged, at times resulting in tragic incidents⁷³. Given the high percentage of global cotton supplies that originate from the Xinjiang province (cited above) for example, it is likely that thousands of EU companies are using cotton produced from the forced labour of Uyghurs in their garment production⁷⁴. According to European Coalition for Corporate Justice, textiles is not the only affected sector: supply chains feeding the EU toy manufacturing industry have been found to be exploiting worker and migrant workers' rights⁷⁵. The EU automobile and cosmetic sectors have also been linked to forced labour in India and Madagascar, from which they solely source mica mineral⁷⁶. For various materials, including some CRMs, the EU is depending on the supply from countries with low standards of governance⁷⁷. This not only poses a supply risk for the EU, but may also exacerbate environmental and social problems, such as conflicts arising from (or aggravated by) access to resources.

Breaches within the EU

Indeed, within the EU itself, 610,000 are estimated to be victims of forced labour exploitation across a range of industries and economic sectors, including agriculture, manufacturing and construction (2012 figures⁷⁸). As highlighted by the EU Fundamental Rights Agency (FRA), migrant workers in the EU are specifically vulnerable to forced labour and there are reports of some experiencing 'concentration camp conditions'⁷⁹. Violations of labour rights and exploitation of workers, including migrant workers, have been documented and reported in many supply chains, including with headquarters

⁷⁰ <https://www.eea.europa.eu/publications/textiles-in-europes-circular-economy>

⁷¹ SDSN, Social spillover effects in the EU's textile supply chains. October 2020; <https://irp-cdn.multiscreensite.com/be6d1d56/files/uploaded/Social%20Spillover%20%20Effects%20in%20the%20EU%27s%20Textile%20Supply%20Chain.pdf>

⁷² [https://www.europarl.europa.eu/RegData/etudes/ATAG/2017/603885/EPRS_ATA\(2017\)603885_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2017/603885/EPRS_ATA(2017)603885_EN.pdf)

⁷³ https://www.ilo.org/global/topics/geip/WCMS_614394/lang--en/index.htm

⁷⁴ <https://www.economist.com/business/2021/03/27/china-boycotts-western-clothes-brands-over-xinjiang-cotton>

⁷⁵ Suppliers of an EU-based company were revealed to have subjected their employees to exploitation and violating both Chinese labour laws and ILO Conventions. Findings revealed the prevalence of 11 hour shifts without breaks, absence of protection measures, violation of freedom of association, insufficient wages for covering basic living costs and exploitation of migrant workers. With China's toy industry producing 75% of the world's toys, risks of such violations are thus inherent to toy supply chains. ECCJ's "What if? Case studies of human rights abuses and environmental harm linked to EU companies, and how EU due diligence laws could help protect people and the planet?"

⁷⁶ ECCJ's "What if? Case studies of human rights abuses and environmental harm linked to EU companies, and how EU due diligence laws could help protect people and the planet?"

⁷⁷ COM(2020) 474 final

⁷⁸ ILO 2012 Global Estimate of Forced Labour – Regional Factsheet European Union. https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-brussels/documents/genericdocument/wcms_184975.pdf

⁷⁹ European Union Agency for Fundamental Rights, Protecting migrant workers from exploitation in the EU: workers' perspectives, 2019. https://fra.europa.eu/sites/default/files/fra_uploads/fra-2019-severe-labour-exploitation-workers-perspectives_en.pdf

inside the EU, particularly in the manufacturing industry⁸⁰ ⁸¹, telecommunication services⁸², the agricultural sector⁸³ and the construction sector⁸⁴.

Sustainable Corporate Governance initiative (SCGI)

The SCGI is a company law initiative that aims to foster long-term, viable and responsible business models, which incorporate climate and environmental considerations and are in line with human rights. One element considered in the ongoing impact assessment is the possible introduction of a general due diligence duty for companies, covering both human rights and environmental aspects and related to all company activities (not a particular product). It would apply to companies of a certain size or generating a certain turnover in the EU. This would entail a general obligation for a company to put in place due diligence process including the mapping of its value chains, identification of risks (including risks covered by the ILO conventions) and risk mitigation.

This company-approach, given its broad nature and scope, will include due diligence steps applicable to a wide range of risks. Therefore, there may potentially be specific risks associated with specific products placed on the EU market to which the SCGI does not address rules tailored to the individual case (see also *Annex 14.1* for more details on the SCGI).

Risk of fragmentation of the internal market

Some Member States have recognised the problem and started putting some rules in place in order to address it. This gives rise to a risk of fragmentation of the internal market, as will be examined in more detail below (under the section on *What are the consequences?* below).

Sub-problem 1: Product design does not sufficiently take into account environmental impacts over the life cycle, including circularity aspects

Product design determines to a large extent the circularity potential of a product⁸⁵. In the context of a circular economy, ‘product design’ must be understood in the broadest sense of the term, as encompassing all choices relating not only to a product’s functionality, but also to its lifespan, reparability, recyclability, suitability for refurbishment or remanufacture as well as the choice of materials, the proportion of recycled and renewable content, the logistics, and the processes used to produce it⁸⁶. It is the combination of these factors which, to a large extent, directly or indirectly determines a product’s longevity and the overall environmental impacts along its life cycle (i.e. the impacts identified in the previous section). Indeed, it has been found that 80% of a product’s environmental impacts is determined at the design phase.⁸⁷

⁸⁰ Violations of labour rights and exploitation of workers, including migrant workers, have been documented in the EU manufacturing industry, https://corporatejustice.org/asi_eccj_report_final.pdf

⁸¹ See the case reported on page 30 of ECCJ’s “What if? Case studies of human rights abuses and environmental harm linked to EU companies, and how EU due diligence laws could help protect people and the planet”

⁸² See page 33 of ECCJ’s “What if? Case studies of human rights abuses and environmental harm linked to EU companies, and how EU due diligence laws could help protect people and the planet” on labour rights of telecommunication employees in Bangladesh, including violation of the right to freedom of association, with workers and union representatives subject to threats, harassment or unlawful dismissals

⁸³ See Alessandra Corrado “Migrant crop pickers in Italy and Spain”, Heinrich Böll Foundation, June 2017; https://www.boell.de/sites/default/files/e-paper_migrant-crop-pickers-in-italy-and-spain_1.pdf#:~:text=In%20the%20Mediterranean%20basin%2C%20Spain%20and%20Italy%20are.restructuring%20processes%20it%20has%20experienced%20since%20the%20mid-1980s.

⁸⁴ Cases of exploitation of migrant workers in Qatar by Irish company in Amnesty International, “Unpaid and abandoned: the abuse of Mercury MENA workers”, and by French company in BHRRC, “Vinci lawsuits (re forced labour in Qatar)”

⁸⁵ EEA Report No 6/2017, *Circular by Design: Products in the circular economy*, p.11

⁸⁶ Ibid

⁸⁷ “How to do EcoDesign?”, a guide for environmentally and economically sound design edited by the German federal Environmental Agency, Verlag form, 2000

Designing products in a more circular way **can also help offset the negative environmental impacts of products more widely and ‘close the loop’ for different materials and products:** for example, the use of recycled materials in one product serves to simultaneously reduce the negative impacts of the original product(s), whose materials are being reused; the capacity to reuse a product’s components through manufacturing reduces the impacts of the new products reusing these components, etc.

We are not yet there, however: the 2020 Circularity Gap report identified poor design of products as one of the chief contributory factors to continued linearity and reliance on virgin materials⁸⁸. In the EU, product design does not yet sufficiently take into account environmental impacts over the product lifecycle, as can be inferred from data on several design-related dimensions, as set out below.

Durability and reparability

First, **products are not being designed to last long enough:** since the late 1980s, the lifespan of consumer products has generally decreased⁸⁹, and in recent years the lifespan of many types of products has become progressively shorter⁹⁰. In France, the NGO “*Halte à l’obsolescence programmée – HOP*” measured a decrease in the lifetime of washing machines from 10 years in 2010 to 7 years in 2019, with strong differences between manufacturers (3.8 years for the worst performing and 10.3 years for the best performing)⁹¹. Another study investigated the lifetime of electric appliances in the Netherlands between 2000 and 2006, and concluded that, for all product categories except one, the lifetime has decreased over this period, from -1% to -20%⁹².

While technological developments may account for some of this, and consumer choices and trends certainly play a role⁹³, this is not always the case: in the case of energy-related goods, **deficient mechanical and electronic robustness**, as well as **software-induced reasons** (including peripheral devices becoming obsolete) have been identified amongst the leading causes⁹⁴. In the case of Information and Communication Technologies (ICT) products such as smartphones, for example, early failure issues (e.g. broken screens/USB-ports; non-durable components such as batteries; software update issues resulting in less upgradability/incompatibility with other devices) are an area of particular concern⁹⁵. A study⁹⁶ for the Greens group in the German *Bundestag* also identifies more than 20 forms of technical deficiencies in products leading to major reductions in the lifespan, and *HOP* has analysed the technical features of inkjet printers⁹⁷, identifying 6 key parts that could be designed for better reparability or longer lifetimes. In the case of appliances, the German Environment Agency (UBA) found that increasing numbers fail within the first five years of their service life – for example household appliances⁹⁸.

⁸⁸ Circularity Gap Report 2020, p. 15, https://assets.website-files.com/5e185aa4d27bcf348400ed82/5e26ead616b6d1d157ff4293_20200120%20-%20CGR%20Global%20-%20Report%20web%20single%20page%20-%2020210x297mm%20-%20compressed.pdf

⁸⁹ There are many drivers leading to a decreasing lifespan of products: the technological progress; economic factors (e.g. when the cost of repair or upgrading is higher than replacement; and psychological reasons, shaped by style, fashion or a perceived change in need). See Circular by design. Products in the circular economy (EEA, 2017).

⁹⁰ Öko-Institut in Germany, Prakash S. e.a., 2016. Also, EEB (2019) Coolproducts don’t cost the earth -full report. www.eeb.org/coolproducts-report

⁹¹ Report “Lave-linge : une durabilité qui prend l’eau ?” (2019)

⁹² Wang F, Huisman J, Stevels A, Baldé CP. Enhancing e-waste estimates: improving data quality by multivariate Input-Output Analysis. *Waste Manag.* 2013 Nov;33(11):2397-407. doi: 10.1016/j.wasman.2013.07.005. Epub 2013 Jul 28. PMID: 23899476. https://www.oneplanetnetwork.org/sites/default/files/the_long_view_2017.pdf, p. 21

⁹³ Öko-Institut in Germany, Prakash S. e.a., 2016.

⁹⁴ BEUC, 2015: Durable goods: more sustainable products, better consumer rights.

⁹⁵ Geplante Obsoleszenz: Entstehungsursachen, Konkrete Beispiele, Schadensfolgen, Handlungsprogramm - Gutachten im Auftrag der Bundestagsfraktion Bündnis 90 / Die Grünen (2013)

⁹⁶ Report: “Imprimantes: cas d’école d’obsolescence programmée ?” (2019)

⁹⁷ UBA (2016) https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/texte_11_2016_einfluss_der_nutzungsdauer_von_produkten_obsoleszenz.pdf

Citizens' experience ties in with the above: there is a general perception amongst citizens that products do not last as long as they should⁹⁹. A survey based in one Member State indicated that respondents "want products to last considerably longer than they are currently used"¹⁰⁰, and in a 2018 public consultation, 83.4% responded that 'the EU should set rules to make sure products have a long lifetime'¹⁰¹. A platform developed by Belgian consumer organisation Test Achats/Test Aankoop to flag products that break too quickly received over 5,400 reports during its first 5 months¹⁰².

A decisive factor for a product's lifespan is its capacity to be easily **repaired**, which in turn is influenced by its initial design¹⁰³. In the EU, it appears that products are generally not designed with ease of repair in mind. In its report¹⁰⁴, the German UBA observed an increase to 36% of the share of permanently fitted batteries in smartphones in 2013. Indeed, the growing tendency to produce more integrated design in recent years has involved an increased use of adhesives (instead of joining mechanisms), making disassembly of parts more difficult: batteries in the best-selling smart-phones of 2019 (48% of the European market) were all fastened within the devices by means of adhesives, meaning that removal is not possible without the intervention of experienced repairers¹⁰⁵, which is likely to significantly increase the cost of repair. Another study found that the proportion of defective electrical devices being replaced by consumers grew from 3.5% in 2004 to 8.3% in 2012¹⁰⁶.

Recyclability, reusability and re-manufacturability

Design also plays a key role in determining the **recyclability, reuse and remanufacturing potential of a product**, in turn affecting its overall environmental impact. For example, compatibility of a product's materials, how easy they are to separate and the use of additives in a product all contribute to determining how recyclable it will be; how well a product's essential components hold up over time is key for reuse¹⁰⁷; and features such as ease of disassembly and modular design determine a product's capacity to be remanufactured.

For **recycling**, increasingly complex product designs (including substances of concern) are creating barriers. In the case of plastics in products and packaging products, mixtures of different polymers or differing materials mean that recyclers are increasingly unable to separate components effectively, and the production of high quality secondary materials is being hampered¹⁰⁸. In the case of waste electrical and electronic equipment (WEEE), the complex product compositions that can contain hazardous materials have been identified as among the main barriers to recycling¹⁰⁹. In the case of textiles, in some instances the chemicals chosen during their production remain in the products throughout the use phase, with implications for possible recovery of the material content and potentially leading to persistent chemicals remaining in products made from recycled materials¹¹⁰. In addition, the growing usage of fibre blends in garments contributes to making recycling more

⁹⁹ The Long View: Exploring Product Lifetime Extension, 2017, p. 21

https://www.oneplanetnetwork.org/sites/default/files/the_long_view_2017.pdf

¹⁰⁰ H. Wieser, N. Tröger and R. Hübner, 'The consumers' desired and expected product lifetimes', proceedings of the PLATE conference – Nottingham Trent University, 17-19 June 2015

¹⁰¹ SWD(2019) 91 final

https://www.beuc.eu/publications/beuc-x-2018-057_premature_obsolescence.pdf

¹⁰² It should be considered that the ease of repair is not only determined by the product design but also the willingness and affordability of repair for consumers.

¹⁰³ *Ibid.*

¹⁰⁴ Cordella, M.; Alfieri, F.; Clemm, C.; Berwald, A.; 2020, Durability of smartphones: A technical analysis of reliability and repairability aspects, p.7.

¹⁰⁵ <https://www.oeko.de/en/press/press-releases/archive-press-releases/2015/reality-check-obsolence/>

¹⁰⁶ A recent paper concluded that, for electric and electronic equipment, it appears technologically feasible to reuse more than 22% of the total weight of in use stock and around 20% of waste according to available technology. See Estimating total potential material recovery from EEE in EU28, <https://doi.org/10.1016/j.resourpol.2020.101785>

¹⁰⁷ Plastics Recyclers Europe, <https://www.plasticsrecyclers.eu/challenges-and-opportunities>

¹⁰⁸ Trinomics, 2020, Emerging challenges of waste management in Europe, <https://trinomics.eu/wp-content/uploads/2020/06/Trinomics-2020-Limits-of-Recycling.pdf>

¹⁰⁹ Schmidt, A., Watson, D., Roos, S., Askham, C., Gaining benefits from discarded textiles: LCA of different treatment pathways, 2016

difficult. (Blends can be processed in mechanical fibre recycling processes, but this makes it difficult to control the material composition of the resulting recycled yarns. For chemical polymer recycling, technologies exist to separate blends as part of the recycling process, although separate steps are required, increasing costs significantly, and the processes are only feasible for materials that are used in large enough portions in the input material¹¹¹.) It is estimated that less than 1% of textiles worldwide are recycled into new textiles¹¹². In the EU, figures suggest only around 15-20% of textiles are collected for recycling or reuse in Europe, whereas 75-80% are either landfilled or incinerated. For furniture, lower quality materials and poor design are contributing to the fact that¹¹³, on reaching its end of life, it is estimated that most furniture in the EU ends up being landfilled¹¹⁴.

Again in the case of furniture, recent moves towards lower quality materials are restricting the potential for **reuse and remanufacture** as products are often not robust enough to be easily moved, and are often not designed for disassembly, reassembly, or reconfiguration¹¹⁵. In addition, if a fire proofing label is attached in a way that it can be easily removed, subsequent reuse is rendered impossible in some cases¹¹⁶. In the case of textiles, studies suggest that the percentage that enters the reuse phase is very limited, with approximately 60% of discarded textiles ending up disposed of due to lack of quality or failures in the garment itself (e.g. pilling, colour fastness properties, tear strength, dimension stability, zipper quality, etc.)¹¹⁷. For electrical equipment, an increase in automated manufacture has led to products being designed with features that render remanufacture less likely¹¹⁸, while in other cases, producers may purposefully design their products to make them difficult to remanufacture, including by embedding microchips¹¹⁹. Indeed, in a market study¹²⁰ under the Horizon 2020 programme, one of the main barriers to wider roll-out of remanufacturing activities identified by the European Remanufacturing Network was “*poor design for remanufacturing: Particularly where remanufacturing is not embedded within the OEM culture, remanufacturing can sometimes be inhibited by poor design*”.

Poor product design also contributes to reducing the overall quality of **secondary raw materials**, in turn limiting the potential scope for their use in production, as seen in the main problem section above¹²¹.

Low recyclability is also affecting several **CRMs** due to a number of reasons, such as¹²²:

¹¹¹ Ellen McArthur Foundation “A new textiles economy: redesigning fashions’ future”, 2017,

<https://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashions-future>

¹¹² ECOS, 2021, Durable, repairable and mainstream: how ecodesign can make our textiles circular, <https://ecostandard.org/wp-content/uploads/2021/04/ECOS-REPORT-HOW-ECODESIGN-CAN-MAKE-OUR-TEXTILES-CIRCULAR.pdf>

¹¹³ EEA, 2017, Circular Economy Opportunities in the Furniture Sector, file:///C:/Users/murrapi/AppData/Local/Temp/1/Report-on-the-Circular-Economy-in-the-Furniture-Sector.pdf

¹¹⁴ European Manufacturing Network Remanufacturing Market Study, 2015: “According to European Federation of Furniture Manufacturers (UEA) statistics, in the EU furniture waste accounts for more than 4% of the total municipal solid waste, of which 80-90% is incinerated or dumped in landfills, with 10% recycled/.”, p.80

¹¹⁵ For example, move from solid wood and metal furniture to less expensive plastic, chipboard and medium-density fibreboard (MDF), particularly in flat-pack furniture; EEA, 2017, Circular Economy Opportunities in the Furniture Sector, p.15

¹¹⁶ Ibid: the EU’s General Product Safety Directive places a general duty on suppliers of consumer products to supply only products which are safe. Transposal of the Directive at Member State level has seen requirements introduced for retailers to ensure that a permanent fireproofing label is on products when they are supplied to the consumers

¹¹⁷ ECOS, 2021, Durable, repairable and mainstream: how ecodesign can make our textiles circular, <https://ecostandard.org/wp-content/uploads/2021/04/ECOS-REPORT-HOW-ECODESIGN-CAN-MAKE-OUR-TEXTILES-CIRCULAR.pdf>

¹¹⁸ Such as sealed electronics that need replacing as a whole at a cost comparable with the original price of the machine, see SWD(2019) 91 final, p.28

¹¹⁹ This is the case of inkjets, and though the predominant reason is linked to preventing counterfeiting, the result inhibits remanufacturing. European Manufacturing Network Remanufacturing Market Study, 2015, P. 74,

<https://www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf>

¹²⁰ Remanufacturing Market Study (Horizon 2020) European Remanufacturing Network et al (2015),

<https://www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf>

¹²¹ Geyer, R.; Kuczenski, B.; Henderson, A. (2016). “Common Misconceptions about Recycling”. *Journal of Industrial Ecology*. 20 (5): 1010–1017.

¹²² JRC Technical Report - Critical raw materials and the circular economy (<https://op.europa.eu/s/vT2H>)

- lower amounts of CRMs (compared to other ‘bulk’ materials, as steel or copper) are dispersed in several components (e.g. electronics), making them difficult to be dismantled at the end-of-life;
- dissipative uses of CRMs in certain applications (e.g. in pigments, lubricants, soldering, braking pads);
- sorting and recycling technologies for many CRMs are not fully developed yet at competitive costs;
- the use of CRMs is relatively new in several applications (including long lasting applications as in renewable energy plants), with few of them already reaching the end-of-life.

Moreover, we lack complete information on the amount of raw materials contained in products (and their exact location in product’s components), in extractive tailings and in waste landfilled, representing potential available sources for future recovery, including recycling. As a result, secondary production of CRMs (i.e. production of these materials from waste recycling) is currently only marginally contributing to meet the internal demand¹²³.

Environmental impacts

The net result of the above is that products are being replaced more frequently than before, involving significant energy and resource use in order to produce and distribute new products and dispose of old ones¹²⁴. Indeed, though the **embedded emissions of products’ non-use phases** – resource extraction, manufacturing, logistics, and end-of-life treatment etc. – are often overlooked, they account for a large part of products’ negative environmental impacts: a study by the European Environmental Bureau (EEB) found that extending the lifetime of all washing machines, notebooks, vacuum cleaners and smartphones in the EU by just one year would save around 4 million tonnes of carbon dioxide (CO₂) emissions annually by 2030 – the equivalent of taking over 2 million cars off the roads for a year (See Table below)¹²⁵. It also concluded that the active use lifetime of smartphones is far below the optimal lifetime they should have to compensate the environmental impacts of their entire lifecycle phase, and that in the case of the four products it examined, repair is always preferable to replacement from the point of view of environmental impact¹²⁶.

¹²³ Raw Materials Scoreboard 2020, <https://op.europa.eu/s/pita>

¹²⁴ EEB, 2019, Cool Products Don’t Cost The Earth, <https://mk0eeborgicuyptuf7e.kinstacdn.com/wp-content/uploads/2019/09/Coolproducts-report.pdf>

¹²⁵ Ibid

¹²⁶ Estimated to lie between 25 and 232 years. (EEB, 2019)

Table 21 Sample findings of EEB study on product lifespan and related impacts on the environment of two electrical products¹²⁷

| | Annual climate impact of use and non-use phase (in tons of CO2 equivalent) | % climate impact that manufacturing, distribution and disposal count for | Expected lifetime | Annual EU sales | Total EU stock | 1 year extension of lifetime estimated to equal |
|-------------------------|---|---|--------------------------|------------------------|-----------------------|--|
| Smart phones | 14.12 | 72% | 3 years | 210,800,000 units | 632,400,000 units | 2.1 Mt CO2 per year by 2030; i.e. over a million cars taken off the roads |
| Washing machines | 17.62 | 25% | 11.5 years | 13,518,000 units | 202,000,000 units | 0.25 Mt CO2 per year by 2030; i.e. 130,000 cars taken off the roads |

Note: Figures for smartphones refer to the region Western Europe (for the year 2018). This may include non-EU countries.

Private sector data does not contradict this: research put forward by the Ericsson company found that over the lifecycle of a smartphone, raw material acquisition and production were the most impactful with regards to toxicities and other environmental impacts, and that the production processes of the different parts were responsible for over 80% of the device's global warming potential associated with climate change¹²⁸.

These trends are also reflected in other sectors: clothing, footwear and household textiles is the EU's fifth highest pressure category for greenhouse gas emissions¹²⁹, and its production and handling consumed within the EU-28 generated emissions of 654 kg CO2 equivalent per person in 2017. A quarter of this was due to production and handling that took place inside the EU-28¹³⁰.

¹²⁷ EEB, 2019, Cool Products Don't Cost The Earth, <https://mk0eeborgicuyptuf7e.kinstacdn.com/wp-content/uploads/2019/09/Coolproducts-report.pdf>

¹²⁸ <https://www.ericsson.com/en/reports-and-papers/research-papers/life-cycle-assessment-of-a-smartphone>

¹²⁹ Higher than that of the recreation and culture, beverages, health, restaurants and hotels, and communication categories; EEA, 2019, Textiles and the environment in a circular economy

¹³⁰ Ibid

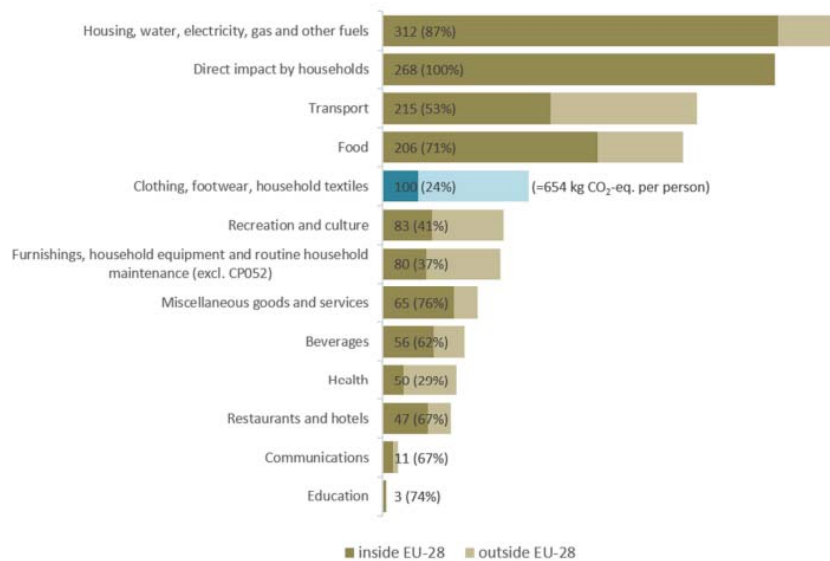


Figure 11 Estimated greenhouse gas emissions in the upstream supply chain of EU household consumption domains, indexed values with textile consumption equalling 100, 2017 (Source: European Environment Agency - EEA, 2019, Textiles and the environment in a circular economy)

In conclusion, there are many studies and analyses showing that **most of the environmental impacts related to products come from life cycle stages other than that of the use stage**¹³¹. A first consequence of such evidence is that, in order to tackle some global environmental issues like climate change, the focus of the policy action should not be limited to direct emissions but address effectively and consistently the most relevant emissions taking place along the entire value chain. While the relative relevance of the different life cycle stages may change for the various impact categories, similar trends have been reported for all the industry sectors for which such an analysis has been carried out. This seems to **confirm the importance of the “design” phase**, understood as the possibility to holistically manage the value chain fostering the different actors to create synergies and operate **to minimise the total environmental impact of products**. This could require a change of design, a change of raw materials, a change of suppliers, a change of logistic solutions, a change of “usage models”, a change of maintenance approaches, or a mix of different solutions. By focusing on a single life cycle stage, or a single impact, the industry ecosystem would not have the right incentives to create the required synergies to optimise the value chain management.

Sub-problem 2: Too difficult for economic operators and citizens to make sustainable choices in relation to products

It is still too difficult for economic operators and citizens to make sustainable choices in relation to products given that relevant **information and affordable options** to do so are lacking.

A recent assessment found that 56% of consumers¹³² would use information on environmental characteristics to buy “more environmentally friendly products”. However, the level of information

¹³¹ E. Hertwich, and R. Wood, “The growing importance of scope 3 greenhouse gas emissions from Industry”, Environ. Res. Lett. 13 (2018) 104013

¹³² This is in line with the findings from the consumer survey conducted in preparation of the empowering the consumers for the green transition, with between 42% and 60% of respondents (depending on the products category) reporting that they would be willing to pay about 5% of the price of a product to receive information on the environmental characteristics of the product. European Commission, IA

available on **product environmental characteristics** is considered unsatisfactory: a 2019 open public consultation¹³³ found that 85% of respondents were unsatisfied or only partially satisfied with the product sustainability information available to them. Indeed, despite actively looking for information about the environmental characteristics of products¹³⁴ (such as their environmental impacts or performance, greenhouse gas emissions, water use etc.) a large number said that the existing information is insufficient^{135, 136}. The other categories do not fare much better: information on the ‘expected **lifespan**’ of products (i.e. years of life, hours of use, number of cycles etc.) is hardly ever made available to consumers¹³⁷, and a majority of consumers find it difficult to find information on product **reparability**¹³⁸.

The above factors may in particular discourage undecided **consumers** (i.e. those who do not usually buy environmentally-friendly products but intend to/are considering doing so) from making more sustainable product choices. Indeed, in particular for this category of consumers, **the ease with which a sustainable product can be differentiated from other products appears to play a role in encouraging sustainable product choice**¹³⁹.

For **economic actors along the supply chain**, considerable gaps exist between suppliers, producers, and waste management operators in relation to information and communication on composition, recyclability and toxicological characteristics of product materials (including for both primary and secondary product materials)^{140,141}. This can be traced to a combination of factors, including traditional confidentiality accompanying commercial transactions and, in the case of complex value chains (such as textiles), the proliferation of indirect commercial relationships (e.g. lack of one-to-one relationships between supply chain actors)¹⁴². The magnitude of the problem is such that European industrial representatives have cited lack of available data (and the resultant inability to compare the green properties of embedded materials or intermediate inputs in certain products) as the single biggest non-cost inhibitor to higher demand and market competition for lower carbon and climate neutral production inputs¹⁴³. In addition, “*lack of technical information on third party products...[where] the knowledge necessary to remanufacture products effectively is not readily available to non-OEMs*” has been identified by remanufacturers as one of the main barriers to wider roll-out of remanufacturing business models¹⁴⁴.

supporting study, forthcoming. Binner, A.S., Robert, I., Ourahmoune, N., Etiquettes environnementales et consommation durable: des relations ambiguës en construction. Revue de l'organisation responsable 9, 2014, p. 5-24.

¹³³ See SWD(2019) 92 final, p. 66

¹³⁴ European Commission, *Consumer Market Study on Environmental claims for non-food products*, 2014, p. 75.

¹³⁵ 60% of consumers found it difficult to determine the environmental impact of products, mostly because the information was not available or not clear or that consumers were unaware that such information existed.

European Commission, *Flash Eurobarometer 367*, 2013, p. 73.

¹³⁶ European Commission, *Sustainable Products in a Circular Economy - Towards an EU Product Policy Framework contributing to the Circular Economy*, 2019, p. 66.

¹³⁷ Around 82 % of respondents agreed, or tended to agree, that it is difficult to find information about how long a product will last. European Commission, *Behavioural Study on Consumers' engagement in the circular economy*, 2018, p 82.

¹³⁸ European Commission, *Behavioural Study on Consumers' engagement in the circular economy*, 2018, p. 81.

¹³⁹ *Flash Eurobarometer 367*, p. 6: “Respondents who do not buy environmentally-friendly products but intend to, are significantly less likely to believe that environmentally-friendly products are easily available compared with those who sometimes buy them (42% versus 54%). This suggests that environmentally friendly products should be more carefully presented so that they could be more easily differentiated from other products.”

¹⁴⁰ [Circular Business Models: Overcoming Barriers. Unleashing Potentials \(squarespace.com\)](https://www.squarespace.com)

¹⁴¹ Nicolli F, Johnstone N, Soederholm P (2012) Resolving failures in recycling markets: the role of technological innovation. *Environ Econ Policy Stud* 14:261–288

¹⁴² The first element of data enabling this traceability is the identity of the players involved in the supply chain. This information is available to the general public only for 2.5% of the companies subject to the Non-Financial Reporting Directive. Alliance for Corporate Transparency: 2019 Research Report, p.76

http://www.allianceforcorporatetransparency.org/assets/2019_Research_Report%20Alliance_for_Corporate_Transparency.pdf

¹⁴³ Sartor, O. (Agora Energiewende), Whittington, E., Markkanen, S. (University of Cambridge Institute for Sustainability Leadership (CISL)): Tomorrow's market today: Scaling up demand for climate neutral basic materials and products, 2021, https://www.corporateleadersgroup.com/files/cisl-clg-agora_tomorrows_markets_today_report.pdf

¹⁴⁴ Remanufacturing Market Study (Horizon 2020) European Remanufacturing Network et al (2015), <https://www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf>

This lack of availability of high quality information on products and their material composition is leading to **missed opportunities for sustainability and reducing the likelihood that value-retaining operations can be performed**. Repair is a case in point: independent repair networks commonly cite inability to understand how product repair should be carried out as a reason for unsuccessful repair¹⁴⁵, and lack of maintenance information is contributing to the fact that establishing maintenance services is mainly perceived as a burden and financial risk¹⁴⁶ (see also *sub-problem 1* as well as the section *What are the consequences?* below). Lack of information or available data on product materials is also creating a barrier to mechanical recycling processes and reducing the amount of material ultimately being recycled¹⁴⁷. Indeed, imperfect information has been identified as a fundamental cause of market failure in recycling markets¹⁴⁸: given that waste needs to be sorted before recycling takes place, and screening techniques are not usually capable of detecting intentionally/unintentionally added chemicals or contaminants in materials¹⁴⁹ (which could inhibit recycling), the absence/lack of access to clear information on material composition means that some materials with recycling potential continue to be overlooked and treated through disposal, causing their value not to be retained. One study¹⁵⁰ points to an ‘almost systematic gap’ in information flows relating to substances of concern in products and materials from the supply chains to the waste sector: even for the few goods¹⁵¹ for which more binding and comprehensive documentation requirements exist, the information is not necessarily sufficiently accessible for the purpose of informing the waste sector (including e.g. because it is documented only on paper, because IT-systems are incompatible, or because confidentiality rules do not allow to the information to be disclosed to all parties). This lack of information also impedes the early detection of materials that should not be recycled, for instance due to the presence of harmful chemicals, which end up polluting otherwise safe waste streams. All of this in turn is **reducing the availability of high-quality recycled content, and therefore the uptake of such content in product design**.

Linked to this, in contrast to virgin materials, **possessing and transferring information on the quality of secondary materials appears crucial for ensuring uptake**: indeed, given that the quality of such materials is considerably more difficult to assess (e.g. presence of unwanted substances), the likelihood that customers will continue to opt for virgin over secondary materials increases if adequate information and guarantees on the characteristics of the latter are not in place¹⁵². In addition, in the absence of more granular information, waste material is likely to continue to be considered as contaminated and structurally deficient *by default* – in turn decreasing its potential to be used to form high quality secondary raw material¹⁵³.

The continued lack of/insufficient product information is also **affecting demand and market competition for more sustainable products and materials**. As mentioned, lack of available data has

¹⁴⁵ <https://www.ellenmacarthurfoundation.org/assets/downloads/ce100/Empowering-Repair-Final-Public.pdf>

¹⁴⁶ acatech/Circular Economy Initiative Deutschland/SYSTEMIQ (Eds.), 2020, Circular Business Models: Overcoming Barriers, Unleashing Potentials, https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/608a9b723926032d9f74aea2/1619696523596/GM_Gesamtbericht+EN

¹⁴⁷ acatech/Circular Economy Initiative Deutschland/SYSTEMIQ (Eds.), 2020, Circular Business Models: Overcoming Barriers, Unleashing Potentials, https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/608a9b723926032d9f74aea2/1619696523596/GM_Gesamtbericht+EN

¹⁴⁸ Nicolli F, Johnstone N, Söderholm P (2012), Resolving failures in recycling markets: the role of technological innovation. Environ Econ Policy Stud 14:261–288

¹⁴⁹ https://chemsec.org/app/uploads/2021/02/What-goes-around_210223.pdf

¹⁵⁰ JRC, 2020, Information Flows on Substances of Concern in Products From Supply Chains to Waste Operators, [ET0219141ENN.en\(1\).pdf](https://ec.europa.eu/jrc/en/ET0219141ENN.en(1).pdf)

¹⁵¹ Such as airplanes, machine tools or medical devices; Ibid.

¹⁵² [Circular Business Models: Overcoming Barriers, Unleashing Potentials \(squarespace.com\)](https://www.acatech.de/~/media/Files/2020/09/Circular-Business-Models-Overcoming-Barriers-Unleashing-Potentials-squarespace.com)

¹⁵³ Nicolli F, Johnstone N, Söderholm P (2012) Resolving failures in recycling markets: the role of technological innovation. Environ Econ Policy Stud 14:261–288

been identified by industrial representatives as a major barrier to the above¹⁵⁴. The report also identifies the lack of reliable and comparable data as a particularly significant obstacle for downstream operators: instead of being able to reliably select the best performing suppliers and market their products accordingly, they are often obliged to presume higher carbon values to avoid legal/liability challenges, and/or rely on average emissions (at national or sectoral level) to evaluate the impacts of embedded materials in products. This inhibits their ability to market the sustainable properties of their products to consumers.

Lack of data may also be inhibiting the adoption of more sustainable business practices in general: generating high quality information on environmental characteristics of products has been identified as a useful tool for revealing new circular revenue streams or methods for cost reduction, and generally propelling businesses in the direction of greater circularity^{155,156}. Failure to do so on a more widespread basis is therefore leading to missed opportunities: for optimising environmental performance of products and businesses, as well as for cost savings.

The above example also underlines how clarity and ease of access to relevant environmental information is crucial for fostering more sustainable decisions by supply chain actors. A major obstacle today is that, where certain sets of information on the environmental characteristics of products do exist – whether due to legal requirements or voluntary measures – **they have no consistent delivery format and are stored in many different places**. Instead, as alluded to above, a variety of formats are used, including physical (e.g. paper/hard copies) and digital (though websites etc.).¹⁵⁷

Market actors often feel they have limited or no access to trustworthy information on environmental performance of products and organisations. Some of that information exists for certain environmental impacts or processes (e.g. EU energy label) and for specific products. Companies can choose to apply the EU Ecolabel or national/regional schemes (e.g. Nordic Swan, Blue Angel, etc.), to products in product categories covered by these “best-in-class” schemes that comply with criteria. However, information provision for the vast majority of the products on the market remains limited. Studies analysing environmental claims¹⁵⁸ for products show that half of explicit claims are misleading. Whilst such voluntary green claims will be addressed by other initiatives more directly, they show that even for products where in theory information is available, this is often not the case or the information is not correct. Initiatives addressing the reliability of voluntary claims will however not necessarily lead to an increase in the availability of information.

In addition (as set out below in the section on *Market failures*), the number of businesses capable of making truly sustainable offers in relation to products remains low due to the **low overall market penetration of circular business models (CBM)**: for example, in sectors such as furniture and electronics/ICT, CBMs represent only 3% and 4% of the market respectively¹⁵⁹, and the overall market share of business models offering reuse, repair, remanufacturing/refurbishing, and upgrading/upcycling in the EU remains limited - Eurostat statistics since 2005 show that there has only been a slight but steady increase in the number of businesses in rental and leasing services, while

¹⁵⁴ Sartor, O. (Agora Energiewende), Whittington, E., Markkanen, S. (University of Cambridge Institute for Sustainability Leadership (CISL)): Tomorrow's market today: Scaling up demand for climate neutral basic materials and products, 2021, https://www.corporateleadersgroup.com/files/cisl-clg-agma_tomorrows_markets_today_report.pdf

¹⁵⁵ Adisorn, T.; Tholen, L.; Götz, T. Towards a Digital Product Passport Fit for Contributing to a Circular Economy. *Energies* 2021, 14, 2289. <https://www.mdpi.com/1996-1073/14/8/2289>

¹⁵⁶ Some companies have used data from product life cycle assessment to identify environmental focal areas or improve circularity along the supply chain (See [Philips](#) or [Levi Strauss](#)) while others report significant cost avoidance secured through comparative life cycle assessment (see [Unilever](#) reports over €700m of cumulative cost avoidance since 2008 through measures focussing on water, energy, waste and materials, and a [media company](#) reached over €30m cost avoidance through a comparative life cycle assessment of packaging focussing on greenhouse gas emissions only)

¹⁵⁷ Ibid

¹⁵⁸ *Environmental claims in the EU – inventory and reliability assessment*, European Commission 2020. *Consumer Market Study on Environmental Claims for Non-Food Products*, European Commission 2014.

¹⁵⁹ REF consultant's supporting study to SPI IA, Task 5

repair services have been declining since 2014. This in turn is reducing the ability and ease with which citizens can access the products and services that result from circular business processes.

Another element making it difficult for economic operators and citizens to purchase more sustainable products in the market is the **price gap** vis-à-vis conventional, less sustainable products. Sustainable products are in some cases intrinsically more costly, given that the more numerous the requirements placed on a product and the sourcing of its materials, the smaller the space of feasible technical solutions, and hence the higher the cost¹⁶⁰. More sustainable products are normally characterised by a longer lifetime compared to alternatives. However, counteracting and delaying naturally occurring breakdown requires a more robust design, in order to resist the multiple events over its extended lifetime. It also often implies reversible assembly methods (e.g. screws) which are more labour-intensive than the irreversible alternatives (e.g. glue, clipping) as these reversible assembly methods facilitate maintenance and repair. All of these aspects can contribute to the prolongation of a product's lifetime, but they can also increase the complexity of the design phase and as a consequence the costs of design and (often) production. In addition, more sustainable products tend to use materials sourced from suppliers respecting human rights, and for that purpose have put in place costly due diligence processes to assess their supply chain. As a result, more sustainable products can be more expensive than their alternatives in the market¹⁶¹, but higher upfront costs can be offset by extended product lifetime and/or lower usage costs. Price is a strong signal in the market and it influences significantly purchasing choices of economic operators and consumers. Often consumers state that they would **pay more for environmentally-friendly products** (if confident about the product's credentials)¹⁶². However, it should be acknowledged that there is a difference between stated preferences and what consumer actually do (revealed preferences): very often stated preferences are biased towards "desirable" behaviours. As a result, the sale of more sustainable products is just a relatively small fraction in most product groups placed on the EU market (see the section on *Market failures* below) because sustainable products are inherently more expensive to design and produce, and unsustainable products are too cheap due to a lack of internalisation of external costs. When looking at waste management, for instance, many sectors do not pay for the costs they incur at the end-of-life¹⁶³. Lately there is growing attention for the problem of textile waste, but in most countries the manufacturers and importers of textile products do not need to pay for the treatment of the textile waste nor for the costs of the environmental damage done at the end-of-life stage (i.e. pollution and GHG emissions).

The aforementioned market failure is exacerbated by the fact that the EU market is a very open market, with streams of imported products from countries with weaker environmental and social legislation, compounded with weaker enforcement of this already lax legislation. Where prices of European products have part of the environmental and social costs internalised into the product price, such internalisation is often smaller for imported products. This does not only lead to bad environmental and social outcomes, but it also harms the competitiveness of the European industry due to a lacking level playing field.

¹⁶⁰ As an illustration, the RoHS Directive prohibited the usage of lead in soldering of electronic components, which was a low-tech, low-cost solution, and led to the usage of more expensive lead-free soldering (e.g. with bismuth / tin / silver alloys).

¹⁶¹ A. Yenipazarli, A. Vakharia, Pricing, market coverage and capacity: can green and brown products co-exist? *European Journal of Operational Research*, 242 (1) (2015)

¹⁶² For instance, 77% of respondents said they were willing to pay more for environmentally-friendly products if confident about the products' credentials, *Flash Eurobarometer 367*, 2013, p. 8.

¹⁶³ See for example examination of the 'polluter pays' principle in ECA, Special report 12/2021: "The polluter pays principle: inconsistent application across EU environmental policies and actions".

Sub-problem 3: Sub-optimal application of the current Ecodesign legislation

Although the Ecodesign Directive is generally considered successful¹⁶⁴ and can in principle address all stages of the product life cycle, evaluations and stakeholder consultations have highlighted that **its full potential was not systematically realised**.

The 2009/125 Ecodesign Directive extended the scope of products that could be subject to Ecodesign measures from the previous scope of “Energy using products”¹⁶⁵ to “Energy related products”¹⁶⁶ on the account that energy using products were “only responsible for 31-36% of the environmental impacts”¹⁶⁷ that had been studied. New energy using products have been regulated under Ecodesign at a constant pace from 2009 to 2015, followed by the adoption of a package of measures in 2019, bringing the total of product groups covered through implementing regulations to 29. Nonetheless, a number of energy related products have not yet been regulated, for a limited portion because the potential for improvement was considered not significant enough¹⁶⁸ but for a larger part because they have not yet been fully assessed by the European Commission.

Thus, if the Ecodesign Directive has indeed prioritised the most relevant products, accounting for the greatest household energy consumption and more than half of energy consumption in the industrial and services sectors¹⁶⁹, **a number of products remain unregulated**, despite falling under the scope of the Directive. Generally, the focus has stayed on energy using products, with the result that so far there are no implementing measures for energy related products that would not qualify as energy using products.

For those products that are regulated, some stakeholders have claimed that **not all significant environmental impacts of the regulated products were tackled**, as implementing regulations have had energy efficiency as a primary objective. The 2012 evaluation of the Ecodesign Directive noted that “while it is broadly recognised that the energy efficiency aspects of the SCP/SIP Action Plan¹⁷⁰ and of EU resource efficiency policy can be served by the Ecodesign Directive and the implementing measures, it is also suggested by some Member State representatives and by environmental NGOs that there have been missed opportunities as a result of the limited coverage in implementing measures of other environmental aspects”¹⁷¹. The evaluation concluded that “there may have been non-energy improvements that have not been addressed as a result of the product scope, policy choices or the underlying technical analysis”.

In its 2020 Special Report on EU action on Ecodesign and Energy Labelling, the European Court of Auditors found that in its most recent proposals the European Commission increased the focus on resource efficiency. For example, “the audit found that the studies carried out to review the legislation on electronic displays and refrigerators considered several environmental aspects other than energy, such as waste management, the presence of critical and rare materials, recyclability, reparability and durability”¹⁷².

¹⁶⁴ See, e.g. ECOS “Ecodesign is one of the greatest success stories of the EU climate policies in the last decades” (https://ecostandard.org/news_events/2021-resolution-the-eu-must-advance-ecodesign-upgrades-to-reach-its-climate-objectives/) and Energy Efficiency Policies around the World: Review and Evaluation, p. 48, World Energy Council 2008. ECOS calls

¹⁶⁵ A product which “is dependent on energy input (electricity, fossil fuels and renewable energy sources) to work as intended, or a product for the generation, transfer and measurement of such energy”.

¹⁶⁶ “any good that has an impact on energy consumption during use”

¹⁶⁷ SEC(2008)2115

¹⁶⁸ For example during preliminary studies to establish the Ecodesign Working Plan or, later in the process, after more extensive preparatory study.

¹⁶⁹ Ecodesign Impact Accounting – Overview report 2018, p. 8, VHK, January 2019.

¹⁷⁰ Communication on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52008DC0397>

¹⁷¹ CSES, p.19

¹⁷² ECA(2020), p. 23

The two reports noted that there is progress in how other aspects than energy efficiency are tackled under ecodesign. However, this progress is a slow learning process that could benefit from being accelerated.

The 2014 evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive¹⁷³ concluded that the level of ambition of Ecodesign implementing regulations was sometimes too low: “most stakeholder groups agree that while for some product groups implementing measures and labels have shown the right ambition level, many other groups have shown levels of ambition that are too low compared to what is technically and economically feasible”. The **evaluation team itself concluded that the ambition level was either correct or too low, but never too high**. The level of ambition achieved in the end is a balance between technical and economic feasibility at European level and positions of EU Member States as expressed during the comitology process.

The ECA report also pointed to significant **delays** in the adoption of new product regulations, stemming both from a regulatory process twice as long as the theoretical process and a package approach to their adoption, which, was found by the ECA to lead “to delays for those product groups that are ready earlier, until the full package is ready to be adopted, leading to further delays in an already lengthy process”¹⁷⁴.

As argued by (which) stakeholders¹⁷⁵, these delays lead to missed opportunities to exploit significant energy saving potentials as soon as possible and risks adopting requirements that are outdated by the time they come into force.

Finally, **lack of compliance** with existing rules represents a further sub-optimal application of the Ecodesign Directive and its implementing regulations. By definition, providing a precise figure on the environmental impact of non-compliance is impossible. However, experts estimate that only around 0.6% of the products placed on the market are verified yearly and some 10 to 25% of products are found non-compliant with ecodesign requirements¹⁷⁶.

The share of non-compliance itself does not provide an indication of the environmental impact as non-compliance can be limited to documentary elements, “marginal” non-compliance with some requirements or more serious issues. However, there is a general agreement that the problem is non-negligible and the general estimate is that, for energy efficiency alone, around 10% of envisaged energy savings are being lost due to non-compliance¹⁷⁷.

¹⁷³ <http://www.energylabevaluation.eu/eu/home/>

¹⁷⁴ ECA(2020), p. 20

¹⁷⁵ [Save the Ecodesign energy-labelling package. Joint letter to the European Commission; Joint Industry Letter on Ecodesign; The Ecodesign Directive \(2009/125/EC\) European Implementation Assessment, European Parliamentary Research Service, November 2017.](#)

¹⁷⁶ See Annex 14 for more information on levels of non compliance.

¹⁷⁷ Ecofys, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive: Background report I: Literature review, December 2013, p.9.

WHAT ARE THE CONSEQUENCES?

The central problem identified by this impact assessment – that life cycle environmental and social impacts of products placed on the EU market are not sustainable – gives rise to several inevitable and negative consequences, including for the **planet**, for **citizens** and for **markets**.

For the Planet

Inefficient use of resources

As levels of high quality recycling and uptake of secondary materials remain low, overall resources are being used inefficiently: unless action is taken, OECD predicts that global materials use will more than double from 79 Gt in 2011 to 167 Gt in 2060¹⁷⁸.

At macro level, the secondary raw materials present in the EU Internal Market are very inefficiently being used to cover the demand (see *section 0 What is/are the main problem(s)?* above, including the discussion on the contribution of recycled materials to raw materials demand).

Negative environmental impacts, including on climate

As mentioned, the consumption footprint of products consumed in the EU internal market per capita is outside the safe operating space for humanity for several categories of impacts (climate change, particulate matter, resource use i.e. fossil fuels minerals and metals)¹⁷⁹. This footprint has been rising by 6% on average between 2010 and 2015, for all these categories of impacts, with a peak at +9% for resource use – minerals and metals.¹⁸⁰

These environmental impacts have a damage on both human health and ecosystem quality, which leads to biodiversity loss. An analysis of the environmental impacts of EU consumption revealed the contribution of different environmental issues to the overall damage to biodiversity loss (Figure 12). Among the different impacts, land use and climate change showed the largest role on biodiversity loss. Climate change was the most relevant impact category for all of the areas of consumption, apart from food in which land use showed the largest impact.

¹⁷⁸ <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf>

¹⁷⁹ Sala, Serenella, et al., Indicators and Assessment of the Environmental Impact of EU Consumption, Joint Research Center Science for Policy Report 2 (2019), figures 58 and 70b.

¹⁸⁰ JRC (2019), Sala S., Benini L., Beylot A., Castellani V., Cerutti A., Corrado S., Crenna E., Diaconu E., Sanyé-Mengual E., Secchi M., Sinkko T., Pant R (2019) Consumption and Consumer Footprint: methodology and results. Indicators and Assessment of the environmental impact of EU consumption. Figures 54 and 55.

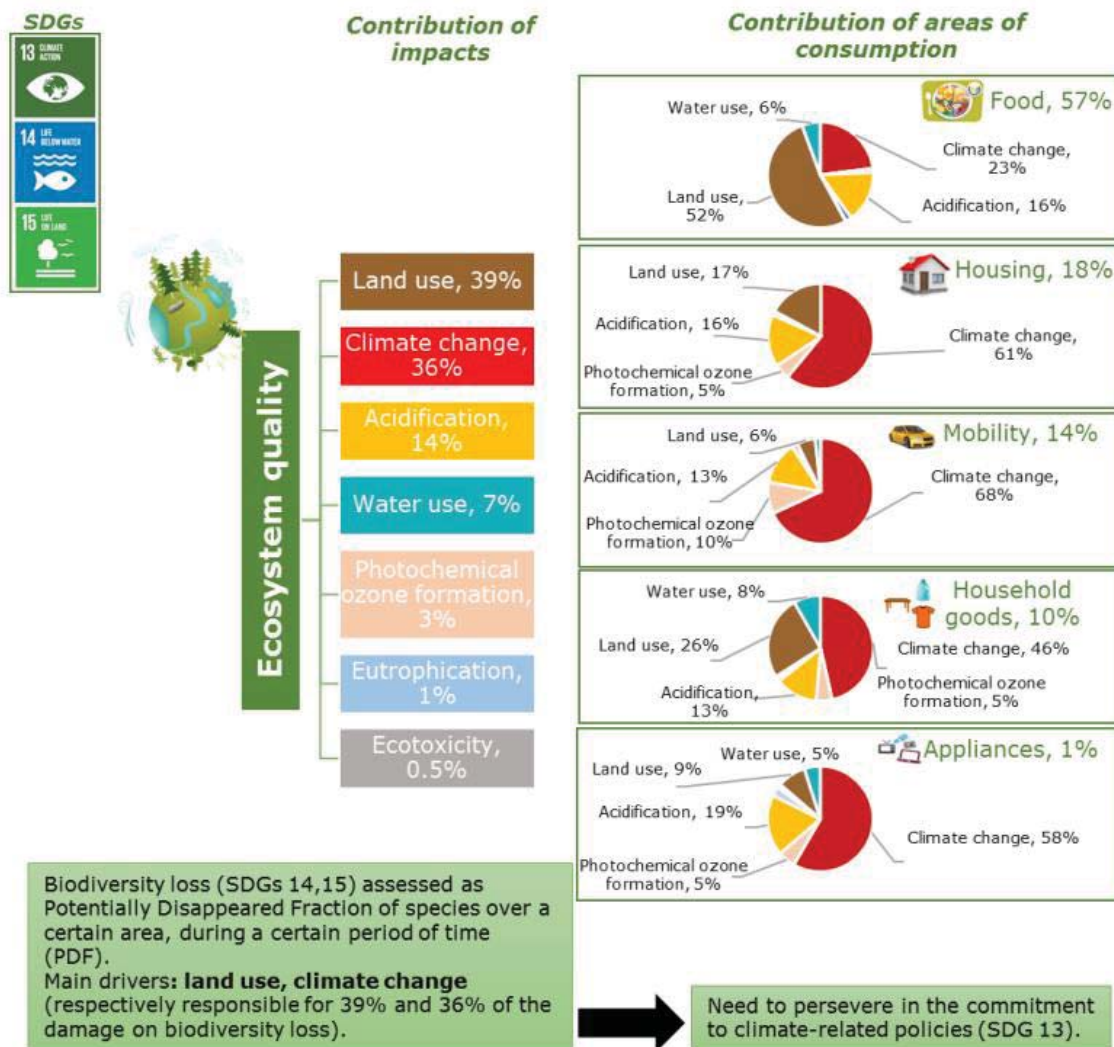


Figure 12 Damage on ecosystem quality generated by EU consumption (2010) by impact category and area of consumption¹⁸¹

While much emphasis is placed on the critical role of renewable energy and energy-efficiency measures in combatting climate change, **the substantial contribution to greenhouse gas emission levels made by the production, processing, transport, use and disposal of goods** (close to 60%¹⁸²) is often overlooked. For example, 10% of global greenhouse gas emissions are caused by clothing and footwear production¹⁸³. In addition, significant pollution is being generated – in particular at the production stage of products and along the supply chain¹⁸⁴.

¹⁸¹ Sala S., Beylot A., Corrado S., Crenna E., Sanyé-Mengual E, Secchi M. (2019) Indicators and Assessment of the environmental impact of EU consumption. Consumption and Consumer Footprint for assessing and monitoring EU policies with Life Cycle Assessment, Luxembourg: Publications Office of the European Union, ISBN 978-92-79-99672-6, doi:10.2760/403263, JRC114814.

¹⁸² Calculations of Fraunhofer ISI based on World Resources Institute (2020): World Greenhouse Gas Emissions: 2016. <https://www.wri.org/resources/data-visualizations/world-greenhouse-gas-emissions-2016>; International Transport Forum (2019): ITF Transport Outlook 2019. OECD Publishing. Paris. https://doi.org/10.1787/transport_outlook-en-2019-en.

¹⁸³ <https://www.europarl.europa.eu/news/en/headlines/society/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographic>

¹⁸⁴ E.g. see https://ec.europa.eu/environment/enveco/resource_efficiency/pdf/studies/issue_paper_digital_transformation_20191220_final.pdf

Waste Generation

The generation and the management of waste can have negative impacts on human health and the environment. Though EU legislation¹⁸⁵ to tackle the problem of waste generation is in place, and has led to progress in recent years¹⁸⁶, the fact remains that **Europe is generating more and more waste: total waste generation increased from 2.2 to 2.3 billion tons from 2010 to 2018** (this equates to 5.0 and 5.2 tons per capita respectively).¹⁸⁷

In terms of individual sectors, worrying trends can be perceived:

1. The amount of **waste electronic and electrical equipment** (WEEE) is one of the fastest growing waste streams in the EU, with current annual growth rates of 2%.¹⁸⁸
2. The average per capita apparent consumption in EU-27 lay at 12.3 kg/capita in 2018, which is an increase of 20 % compared to the 10.1 kg/capita in 2003¹⁸⁹. It is estimated that between 1.7 and 2.1 million tonnes of used textiles are collected annually throughout the EU, with the majority of the remaining 3.3 to 3.7 million tonnes thought to be discarded in mixed household waste, with a much smaller amount being stored in increasing stockpiles in households¹⁹⁰. According to European Federation of Furniture Manufacturers (UEA) statistics, **80-90% of EU furniture waste is incinerated or sent to landfill**, with only 10% being recycled. Reuse activity in the sector is considered to be low¹⁹¹.

¹⁸⁵ Of particular relevance in this respect are: Directive 2008/98/EC on waste (Waste Framework Directive); Directive 94/62/EC on packaging and packaging waste; Directive 2012/19/EU on waste electrical and electronic equipment (WEEE); Directive 2017/2102 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

¹⁸⁶ 2018 Report on the implementation of EU waste legislation, including the early warning report for Member States at risk of missing the 2020 preparation for re-use/recycling target on municipal waste, COM(2018) 656 final

¹⁸⁷ Eurostat. Generation of waste by waste category, hazardousness and NACE Rev. 2 activity [ENV_WASGEN]

¹⁸⁸ COM/2020/98 final

¹⁸⁹ JRC, 2021, Circular Economy Perspectives in the EU Textile sector,

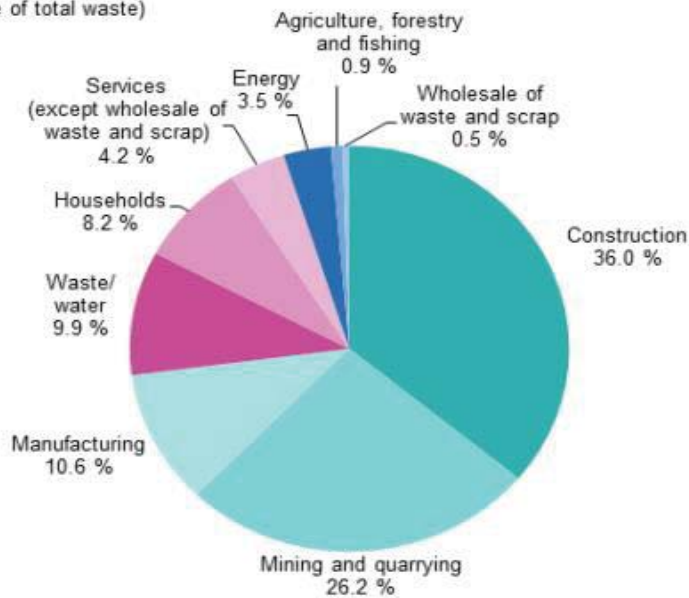
file:///C:/Users/murrapi/AppData/Local/Temp/1/jrc125110_ce_perspectives_for_eu_textiles_tr_10.06.2021_final.pdf

¹⁹⁰ Ibid

¹⁹¹ Furn36 (2017). Circular Economy in the furniture industry: Overview of current challenges and competences needs, <https://circulareconomy.europa.eu/platform/sites/default/files/circular-economy-in-the-furniture-industry.pdf>

Waste generation by economic activities and households, EU-27, 2018

(% share of total waste)



Source: Eurostat (online data code: env_wasgen)



Figure 13 Waste generation by economic activities and households, EU-27, 2018

For Citizens

Products break too quickly and cannot be easily repaired

A product's **lifespan** is usually defined as the period from product acquisition to its disposal by the final owner (Murakami et al., 2010). The period includes any repair, refurbishment or remanufacturing and periods of storage when the product is no longer in use (Bakker et al., 2014).

As further elaborated in under *sub-problem 1* above, since the late 1980s, the lifespan of consumer products has generally decreased¹⁹², and in recent years the life span of many types of products has become progressively shorter¹⁹³. The European Environmental Bureau computed the optimal life duration that a product would need to have to compensate the GHG emissions incurred during production, considering improvements in energy consumption of products. They conclude that, even under optimistic assumptions regarding technical progress, this optimal lifetime is 1.5 to 8 times above the one achieved¹⁹⁴. New tendencies in product design (e.g. design becoming more miniaturised, integrated, encapsulated, and complex; increased use of adhesives etc.) also means that more and more products are not adapted for repair and longevity.

¹⁹² There are many drivers leading to a decreasing lifespan of products: the technological progress; economic factors (e.g. when the cost of repair or upgrading is higher than replacement; and psychological reasons, shaped by style, fashion or a perceived change in need). See Circular by design. Products in the circular economy (EEA, 2017).

¹⁹³ Öko-Institut in Germany, Prakash S. e.a., 2016. Also, EEB (2019) Coolproducts don't cost the earth -full report. www.eeb.org/coolproducts-repor

¹⁹⁴ EEB (2019) Coolproducts don't cost the earth - full report. www.eeb.org/coolproducts-report

Citizens are perceiving these tendencies, which in turn – in the absence of other incentives – is decreasing the likelihood that they will engage with repair activities. Though improved information on product reparability could act as one such incentive, as outlined in *sub-problem 2* above, this information is not always readily available: a European Commission behavioural study¹⁹⁵ found that about 36% of consumers do not generally repair defective products, and that **not knowing how to repair them/where to get them repaired** (i.e. due to lack of repair manual and information about the availability of repair services) influences the decision not to do so, as did lack of availability of spare parts. In addition, **high repair costs** are a major obstacle to consumer engagement in repair¹⁹⁶, especially if the cost of repair is near or comparable to the cost of purchasing a new product. Perception by consumers that products have been **intentionally manufactured with low quality materials** in order to last for a shorter time also discourages repair attempts¹⁹⁷.

A combination of the above issues is contributing to the need for consumers to replace products sooner than expected, leading to indirect additional costs as well as to increased ‘hassle costs’ related to the need to frequently replace products¹⁹⁸.

Citizens are willing to engage in sustainability but are unable to fulfil their green ambitions

More and more citizens are willing to engage in circular practices and product choices¹⁹⁹. A 2020 survey²⁰⁰ found **that the majority of consumers believe they have a role to play in tackling environmental issues**, and that for certain product groups, environmental impact of companies’ products has overtaken brand recognition in consumer buying decisions.

As things stand however, citizens are prevented from fulfilling their green ambitions and, in certain cases, are instead making sub-optimal choices. As previously mentioned, one of the factors contributing to this is lack of information. In a 2019 public consultation, a majority of consumers²⁰¹ expressed broad dissatisfaction with environmental information on products: They also highlighted that:

- Environmental information on products is generally not sufficient to support consumer decision-making;
- More **information about specific product themes**, including the product’s entire life-cycle, information on post-consumer (i.e. waste) impacts, and information on the durability of products, should be provided;
- Where it is provided, information is often **too difficult to understand**, in particular making it **too difficult to compare** products.

¹⁹⁵ The most important reasons for not repairing products is the high price of repairs, followed by the preference for a new product, and the feeling that the old product was simply obsolete or out of fashion.

Depending on the product type, between 5 and 10% of consumers surveyed did not repair the product because they did not know where to get it repaired and between 1 and 7% because of the unavailability of spare parts.

European Commission, *Behavioural Study on Consumers’ engagement in the circular economy*, 2018, p. 86.

¹⁹⁶ LE Europe, VVA Europe, Ipsos, ConPolicy and Trinomics: “Behavioural Study on Consumers’ Engagement in the Circular Economy - Final Report” (2018), <https://op.europa.eu/en/publication-detail/-/publication/5de64de7-f9d3-11e8-a96d-01aa75ed71a1/language-en/format-PDF>.

¹⁹⁷ Nazli Terzioglu, 2020

¹⁹⁸ BEUC, 2015

¹⁹⁹ European Commission, *Behavioural Study on Consumers’ engagement in the circular economy*, 2018, p. 10. In addition, see more information in section on *Consequences*.

²⁰⁰ <https://www.ingwb.com/media/3076131/ing-circular-economy-survey-2020-learning-from-consumers.pdf>

²⁰¹ 85% of consumers. SWD(2019) 92 final, p. 66

Indeed, the fact that information about products' environmental characteristics is sometimes not at all provided, or provided in an inconsistent way, prevents consumers from taking it adequately into account in their decision-making process²⁰².

Similarly, as information on the lifespan of products is regularly not available to consumers²⁰³, they often **use other indicators** (e.g. price or brand²⁰⁴) to gauge the durability of the goods. This often leads to consumers associating more expensive goods with longer lifespans²⁰⁵, despite the fact that consumer organisations point out that “in non-transparent markets high purchase prices are not always good indicators for the durability of products”²⁰⁶. Ultimately, the lack of information on a product's durability can lead to sub-optimal purchase choices²⁰⁷, with consumers unknowingly purchasing goods that are potentially more difficult to repair or that have worse software update/upgrade policies than the available alternatives, in turn leading to increased ‘hassle costs’ (e.g. related to efforts and expenses with organising repair or replacing the good).

For Markets

Markets are resulting in a sub-optimal consumption of sustainable products

As seen in the previous section, EU consumers are increasingly willing to engage in sustainable practices and purchase more sustainable products. However, markets in general are distorted and biased against sustainable products, for the reasons described in *section 0 Market failures* below. The EU Internal Market is arguably one of the “greenest”, however it is not an exception to this trend: a study carried out in 2018 by *Umweltbundesamt* (the German Environmental Agency) has analysed the market share of products carrying an official eco-label (see Figure 14) in Germany (the largest consumer market in the EU²⁰⁸). The results demonstrated that environmentally friendly products occupy still a niche in their respective product groups investigated, with on average a 7.5 % market share.

²⁰² Wrap.org, *The Effectiveness of Providing Labels and other Pre-Purchase Factual Information in encouraging more Environmentally Sustainable Product Purchase Decisions: Expert Interviews and a Rapid Evidence Assessment*, 2019, p. 36.

²⁰³ Around 82 % of respondents agreed, or tended to agree, that it is difficult to find information about how long a product will last. European Commission, *Behavioural Study on Consumers' engagement in the circular economy*, 2018, p. 82.

²⁰⁴ Cox, J., Griffith, S., Giorgi, S., & King, G., *Consumer understanding of product lifetimes*. Resources, Conservation and Recycling, 79, 2013, p. 21-29.

²⁰⁵ European Commission, *Behavioural Study on Consumers' engagement in the circular economy*, 2018, p. 116.

²⁰⁶ BEUC, *Durable Goods: more sustainable products, better consumer rights*, 2015, p. 10.

²⁰⁷ The more durable good generally has a lower total consumer cost compared to a standard option, mostly due to avoiding the purchase of the replacement appliance, with the exception being when the price is very low.

European Commission, *Study on the durability of products*, 2015, p. 157-158.

²⁰⁸ "Household final consumption expenditure (current US\$) | Data". data.worldbank.org

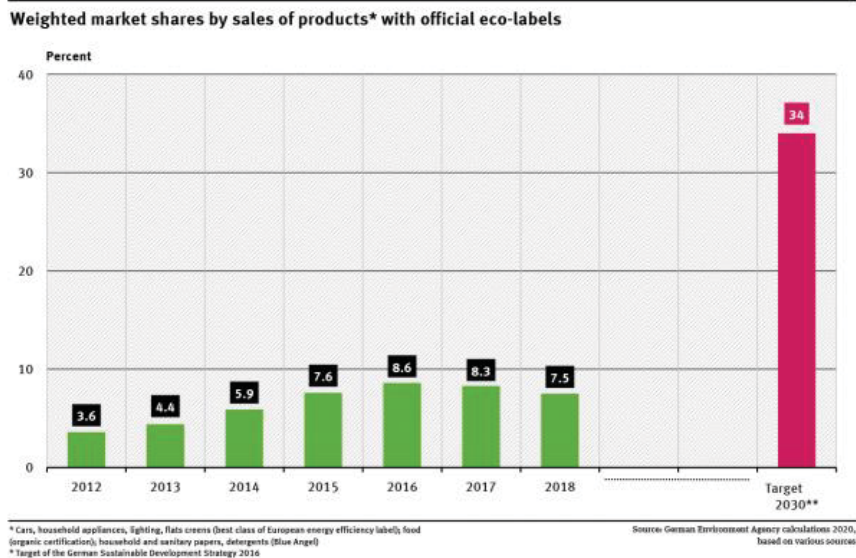


Figure 14 Weighted market shares by sales of products with official eco-labels²⁰⁹

Widening the analysis to the entire EU Internal Market, the EU Ecolabel²¹⁰ can offer a potential lens through which the current sustainability levels of EU products can be gauged. EU Ecolabel criteria have now been established for 24 product categories (including some identified as priority value chains in the CEAP). As of March 2021, the total number of EU products (which in the context of the EU Ecolabel include goods and services) awarded an EU Ecolabel amounted to 78,071. Though this is a substantial achievement, it represents those goods and services that tend to be within the top 10-20% of the most environmentally friendly within their category²¹¹. This suggests that **a majority of products sold in the Single Market remain below these performance levels**. In addition, uptake under the product groups covered has been very uneven – including at geographical level, where product awards range from one in some Member States to thousands in others. There are several examples in Member States of under-internalisation of externalities at product level as well as at sector level. For instance, for the Danish apparel sector, impacts are dominated by GHG emissions, air pollution and water. Should the sector have to internalise the natural capital costs (i.e. the externalities) of indirect land use change, water consumption, air and water pollution and GHG emissions, the total cost would be DKK 3,390 m, equivalent to 11.7% of total revenue for the sector²¹².

Increasing market fragmentation

An increasing number of initiatives are emerging at national level in the EU, with the aim of promoting the sustainable production and consumption of products (see section on *Drivers*). While this is positive proof of Member States' increasing willingness to engage with circular economy practices, the existence of different provisions across Member States risks hindering operations facing

²⁰⁹ German Environment Agency, <https://www.umweltbundesamt.de/en/data/environmental-indicators/indicator-environmentally-friendly-consumption#assessing-the-development>

²¹⁰ The EU label of environmental excellence that is awarded to products and services meeting high environmental standards throughout their life-cycle, from raw material extraction, to production, distribution and disposal.
https://ec.europa.eu/environment/ecolabel/index_en.htm

²¹¹ <https://eeb.org/work-areas/resource-efficiency/eu-ecolabel/>

²¹² Danish apparel sector natural account, <https://www2.mst.dk/Udgiv/publications/2015/01/978-87-93283-07-7.pdf>
<https://www2.mst.dk/Udgiv/publications/2015/01/978-87-93283-07-7.pdf> <https://www2.mst.dk/Udgiv/publications/2015/01/978-87-93283-07-7.pdf>

different requirements and is becoming a cause for concern for businesses operating at cross-border level. This emerged clearly in the consultations carried out in the preparation of the Impact Assessment (*please see further details in the table below*).

If left unchecked, such diverging approaches are likely to create further difficulties for businesses and act as a disincentive to their continued investment in innovation and sustainable product development – in turn reducing the number of sustainable products on the market and increasing prices.

Table 22 Examples of responses from businesses/business associations (alphabetical order). Sources: feedback on the Inception Impact Assessment or, where linked, published by organisations themselves.

| X | Name of entity | Excerpt supporting SPI in the context of EU internal market |
|----|---|--|
| 1. | <u>American Chamber of Commerce to the EU</u> | <i>“Design is a crucial phase to improving product sustainability and we take note of the need to extend the scope of the Ecodesign Directive. A harmonised and broadened eco-design framework is an important contribution to a level-playing field for the assessment of different products and material applications. Diverging eco-design product rules amongst Member States represent a barrier to intraEU trade and makes it harder for consumers to access and for companies to offer products crossborder. The Commission must take decisive action in line with the principles established by the Single Market Transparency Directive (EU) 2015/1535 to avert a fragmentation of EU product rules.”</i> |
| 2. | APPLiA - Home Appliance Europe | <i>“European legislation should be the preferred option over national legislation APPLiA supports legislation harmonised at EU level. Lack of harmonisation at EU level increases burden on industry. National legislation initiatives should not impede the free circulation of goods in the internal market. EU measures facilitate a more harmonised single market with incentives for more sustainable and innovative products across the whole EU. This provides strong economic potential for both EU and non-EU operators that offer sustainable products by reducing market fragmentation due to individual Member State initiatives. A key example is the law recently approved in France which sets specific technical modifications for washing machines from 2025 onwards and de-facto creates a barrier to trade for European manufacturers. There are also ongoing discussions on national green deals in other countries (such as Italy, Germany, and Luxembourg) which APPLiA’s General Principles for Sustainable Product Policy 2 www.applia-europe.eu APPLiA Home Appliance Europe may also have potential measures in their scope which could impact the internal market. When regulation is relevant and needed, it must be tackled at European level and subject to thorough impact assessment”.</i> |
| 3. | <u>BusinessEurope</u> | <i>“An effective Sustainable Products Policy should start from a set of key general principles that can be transversally applied to all the different market segments. Additionally, specific sustainability principles can only be developed at the product group level to capture the peculiarities of different product categories. It will be</i> |

| | | |
|----|---|--|
| | | <i>extremely important to ensure a harmonized and coherent development at European level, to avoid different approaches at Member States' level that can potentially hinder a smooth transition towards an EU circular economy market. An appropriate level of market surveillance should accompany new sustainability requirements."</i> |
| 4. | Closed Pallet Pooling Coalition | <i>"Cross-border circular business models and sustainable production processes should be further promoted by ensuring a high-level of harmonization of rules at EU level. The different interpretation and application as well as the lack of guidance of EU legislation at national level can hamper the development of sustainable circular business models if they fail to properly recognize the importance and the specific challenges of this sector"</i> . |
| 5. | <u>DIGITALEUROPE</u> | <i>"When it comes to enforcement, we strongly believe any risk of fragmentation of the Single Market should be avoided, the burden on companies be relieved and fair competition protected. Therefore, we call for enforcement to be consistent across all Member States and products to be covered equally to avoid discrepancies and margins for interpretation, with product specificities taken into account. Based on our experience from the Ecodesign Directive, we have witnessed the need to provide guidelines to MSAs to facilitate the understanding of multiple policies covering very complex value chains. Likewise, national legislations should aim at strengthening the Single Market to put the EU as a whole at the forefront of the green transition. (...) Hence, we support initiatives that avoid fragmentation of the single market such as EU-wide voluntary commitments and information requirements, taking product specificities into account. Such information and commitments should be based on standards to ensure fairness, consistency, transparency, and comparability."</i> |
| 6. | <u>Ecopreneur.eu – European Sustainable Business Federation</u> | <i>"We strongly advise the European Commission to make the Sustainable Product Initiative coherent with other regulatory initiatives and revisions, such as the sustainable textiles and chemicals strategies, policies regarding construction products, ecodesign and energy efficiency labelling, and waste regulation, for example, to make sure EU Legislation is coherent and supports the principle of free movement of goods within the Common Market. To avoid market fragmentation, the Initiative should also strive toward harmonisation of policies at EU national level, especially those accelerating the transition towards a circular economy, such as harmonised EPR schemes."</i> |
| 7. | Eurima - European Insulation Manufacturers Association | <i>"Eurima welcomes the Commission's intention to harmonize and set a baseline of principles for a market of sustainable products in Europe. We support the objectives of the Circular Economy Action Plan in this regard as it will contribute to a</i> |

| | | |
|-----|---|--|
| | | <i>fairer market and allow for a better valorisation of the more sustainable products in the construction sector”.</i> |
| 8. | European Bedding Industry | “A harmonised set of rules and a really functioning Internal Market to ensure a level-playing field throughout the European Union is essential”. |
| 9. | European Federation of the Parquet industry | “We need harmonised rules and a really functioning Internal Market to ensure a level-playing field throughout the European Union (and beyond). The principles of the “Sustainable Products Initiative”, such as circularity, should be translated in (existing) standards and there is already a platform for doing it: the European Committee for Standardization, CEN (and the International Organization for Standardization (ISO) to go beyond EU borders)”. |
| 10. | European Furniture Industries Confederation | “Harmonised circular economy rules at EU level, involvement of standardisation bodies and harmonised implementation of rules in the EU and globally - Sustainability principles for products and services are only partially addressed in EU legislation. The sustainable products initiative has the potential to expand requirements under EU legislation, when appropriate, and to contribute to a more complete and harmonised framework at EU level. With the upcoming initiative we see an opportunity for strengthening the internal market, avoiding that national initiatives address the same issue in different ways. It is important that requirements at EU level are streamlined, clear and detailed enough to avoid misaligned implementation of EU rules at national level”. |
| 11. | Orgalim, Europe's Technology Industries | “We would value a cooperation between policy makers and industry to create a sound framework, preferably a harmonised EU one. If not, barriers for more circularity beyond manufacturers’ control will continue to exist and doubts will block further market introduction”. |
| 12. | PlasticsEurope | “The Sustainable Products Initiative must preserve the integrity of the Single Market and ensure the competitiveness of the European economy. One clear and consistent framework for products across the EU Single Market remains critical to European industrial competitiveness and the industry’s ability to innovate at scale and provide solutions to deliver on the EU Green Deal. PlasticsEurope believes that the future policy developments must preserve the integrity and well-functioning of the EU Single Market and welcomes the European Commission’s intention to adopt the initiative based on Article 114 TFEU (...) In addition, the European Commission should maintain ownership in the implementation process, including monitoring and follow-up processes with Member States. This will enhance legal certainties for economic operators and will prevent any fragmentation of the internal market. Any necessary guidance or |

| | | |
|-----|---|--|
| | | <i>implementation plan must be foreseen and delivered well in advance of the deadline for transposition by the Member States. Furthermore, to safeguard not only competitiveness among the Member States but also of the whole EU economy vis-a-vis third countries, the European Commission should consider the adoption of measures aimed at ensuring that the same sustainability requirements apply to products imported from outside the EU. Market surveillance should therefore be reinforced.”</i> |
| 13. | Plastics Recyclers Europe | “The industry, however, must be aided with harmonized and transparent rules that are implemented at the EU level”. |
| 14. | Swedish Association of Engineering Industries | <i>“Through the experience we have until today, a well-functioning internal market will be the basis for circular business models to function internationally. The New Legislative framework should be applied to all product legislation and rules must be harmonized within the EU. A harmonized regulatory framework within the EU makes it easier for companies to sell products as a service, in order to better reuse and renovate recycled material. Partnerships and collaborations between different actors also benefit from a common regulatory framework in the internal market. Rules that mean that national borders within the EU give different requirements lead to increased bureaucracy and special requirements. This damages the market and hinders the growth of the circular economy”.</i> |
| 15. | TEKO - Swedish textile and clothing industry organisation | <i>“As much as possible shall be regulated in as few laws as possible. The single market has contributed to an improved prosperity and more opportunities for European citizens and businesses. Therefore, it is crucial to ensure a harmonized approach throughout the EU of the various circular economy measures. If not, it will damage the market and hinder the growth of the circular economy”.</i> |

Loss of resources

Even though the generation of **secondary raw materials** has increased in recent years (for example more than 50% of some metals such as iron, zinc, or platinum are recycled and they cover more than 25% of the EU’s consumption) much progress has still to be made. Many materials, especially those needed in renewable energy technologies or high-tech applications such as rare earths, gallium, or indium, secondary production makes only a marginal contribution to EU’s consumption²¹³. This is a loss of potential value to the EU economy and a source of strain on the environment and climate. As a result, valuable materials end up in landfill. In general, the contribution of recycled materials to raw materials is low: only 6% for plastics²¹⁴.

²¹³ Foresight on Critical Raw Materials for European Industry, March 2020, https://ec.europa.eu/info/sites/default/files/foresight_newsletters_collection_online_2020.pdf

²¹⁴ A European Strategy for Plastics in a Circular Economy, COM(2018) 28 final

The fact that some basic materials are not recycled, can also be an indication that the cost of recycling is high compared with the cost of virgin resources. These resources are therefore not 'valuable' enough to be recycled at current prices. However, there are a number of proportionate measures that can be taken to enable recycling at lower cost, therefore changing the economic viability of recycling and ensuring that resources are not lost to the economy.

Low recycling levels can sometimes be due to impurities that reduce the potential applications of the recycled material, a phenomenon known as downcycling (e.g. steel from cars being re-used in construction due to excessive copper impurities²¹⁵). In addition, large amounts of potentially recyclable resources leave Europe in the form of waste and scrap²¹⁶. As a consequence, despite relatively high rates of waste being collected for recycling, only a fraction of this material flow is being effectively re-used, thus compromising the development of the recycling industry and the circular economy in general. Aluminium is a good example: since 2002 the EU has been a continuous net exporter of aluminium scrap (Figure 15)²¹⁷.

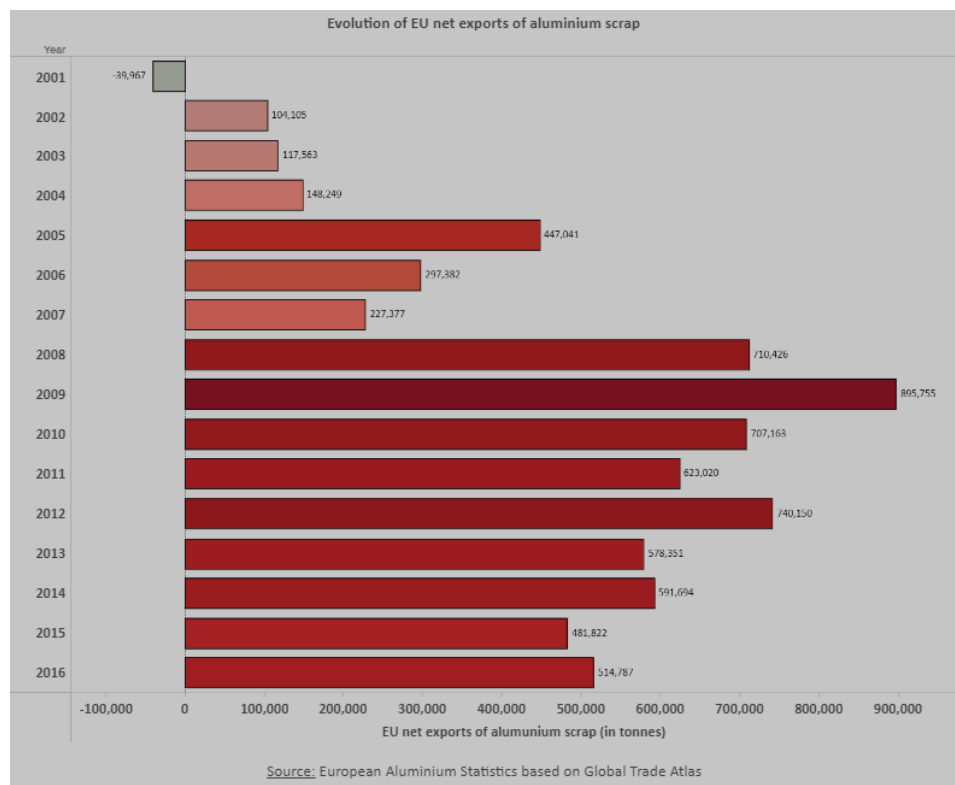


Figure 15 Evolution of EU net exports of aluminium scrap

In 2020, exports of recyclable raw materials – which include recyclable waste and scrap as well as secondary raw materials – from the EU Member States to non-EU countries amounted to 38.4 million tonnes²¹⁸. The volume of these exports has been on an upwards trend since 2004, reaching a peak in 2020 (a 70% increase compared with 2004). On the other hand, imports of recyclable raw materials from non-EU countries into the EU amounted to 44.7 million tonnes in 2020, a slight decrease

²¹⁵ Savov, L.; Volkova, E.; Janke, D. (2003). "Copper and tin in steel scrap recycling" (PDF). RMZ - Mater. Geoenviron. 50 (3): 627–640

²¹⁶ Foresight on Critical Raw Materials for European Industry, March 2020, https://ec.europa.eu/info/sites/default/files/foresight_newsletters_collection_online_2020.pdf.

²¹⁷ <https://www.european-aluminium.eu/data/recycling-data/recycling-eu-net-exports-of-aluminium-scrap/>

²¹⁸ <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210429-1>

compared with 2019 (45.0 million tonnes) and an increase of about 2% compared with 2004 (43.7 million tonnes)²¹⁹.

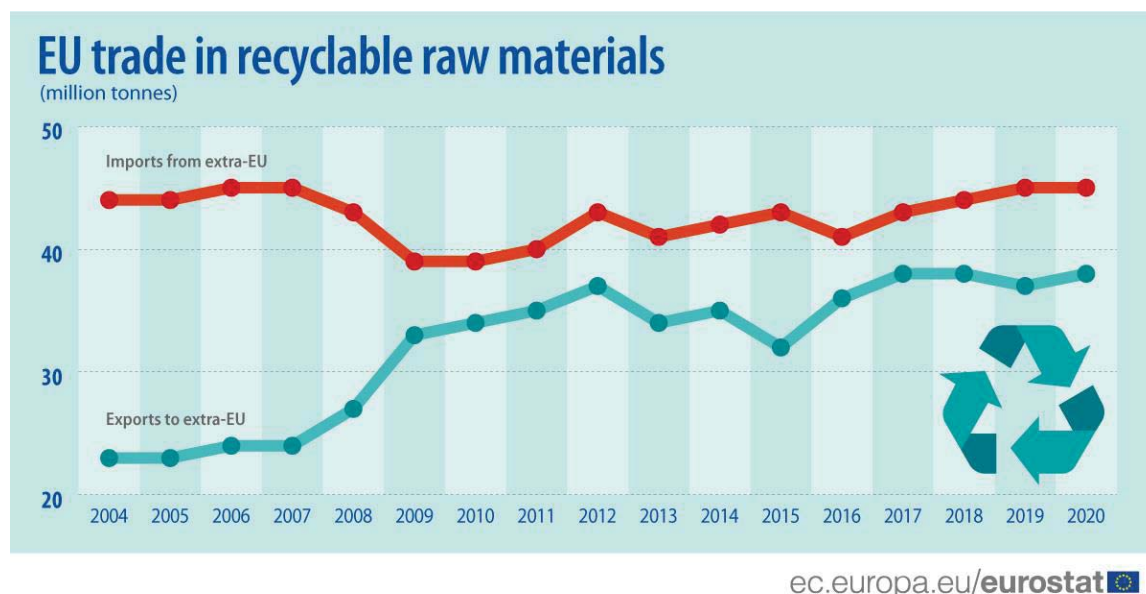


Figure 16 EU trade in recyclable raw materials

There is a loss of valuable economic resources whenever products that could be designed for a long duration of use are actually designed and manufactured for single use, thereby reaching the shortest possible usage duration. According to the Circular Gap Report by the Dutch NGO Circle Economics, around 31% of the materials entering the global economy are being used by society as short-lived non-food products, lasting less than one year.²²⁰ Focusing on plastics, globally 300 million tonnes of plastic are produced each year²²¹. It has been estimated that about 100-150 million tonnes of this are for single use products²²².

This is not efficient from an economic point of view and generates negative environmental impacts: in the EU, between 50% and 70% of marine litter, measured as beach litter counts, is made of single-use plastic items²²³. World-wide, 5 to 13 million tonnes of single-use plastic ends up in the ocean²²⁴.

Another example of loss of valuable economic resources is the destruction of unsold consumer products. This phenomenon has been highlighted by very visible cases, such as the destruction of millions of unsold durable goods in France by a major online retailer²²⁵ in 2019²²⁶. The Impact

²¹⁹ <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210429-1?redirect=%2F%2Fec.europa.eu/eurostat/web/main%2Fhome>

²²⁰ Circle Economics, “Circularity Gap Report 2020”, <https://www.circularity-gap.world/2020>

²²¹ <https://www.nrdc.org/stories/single-use-plastics-101#:~:text=We%20produce%20300%20million%20tons,is%20for%20single%2Duse%20items.&text=Left%20alone%2C%20plastics%20don't,what%20are%20known%20as%20microplastics.>

²²² <https://plasticoceans.org/the-facts/>

²²³ Joint Research Centre, Top Marine Beach Litter Items in Europe, 2017. <https://ec.europa.eu/jrc/en/publication/top-marine-beach-litter-items-europe> and Impact Assessment of the “Reducing Marine Litter: acting on single-use plastics and fishing gear” SWD(2018) 254

²²⁴ Jambeck J et al. 2015, ‘Plastic waste inputs from land into the ocean’, Science, vol. 347, no. 6223, pp. 768-771. Available from: <https://science.sciencemag.org/content/347/6223/768>; Pew Charitable Trusts and SYSTEMIQ 2020, Breaking the Plastic Wave. Available from: https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf; Ryberg M et al. 2018, Mapping of global plastics value chain and plastics losses to the environment, United Nations Environment Programme. Available from: <https://wedocs.unep.org/handle/20.500.11822/26745>

²²⁵ M6, “Capital” enquiry of January 2019 on Amazon: <https://www.rtl.fr/actu/debats-societe/video-capital-quand-les-salaries-d-amazon-detruisent-des-tonnes-d-invendus-7796192959>

²²⁶ Despite the visibility of the case, the same online retailer has been the purpose of identical criticism two years later (2021) in the United Kingdom, following an enquiry that revealed the destruction of several hundreds of thousands of unsold goods per week in a single online sales warehouse in the United Kingdom, with less than one quarter of this volume being donated. ITV News Investigation “Amazon destroying millions of items of unsold stock in one of its UK warehouses every year”, June 2021,

Assessment²²⁷ of the French law (n°2020-105)²²⁸ prohibiting the destruction of unsold durable goods, based on a study on gifts of durable goods²²⁹, states that “out of EUR 140 billion consumed by households in non-food consumer durables, EUR 6 billion represent the gross amount of unsold goods. These unsold goods can then be sold through different distribution channels such as private sales, discounters or wholesalers. The share of unsold goods remaining after using these distribution channels (the net amount) represents 0.6% of non-food durable consumer goods consumed by households, or EUR 800 million. Of this EUR 800 million of unsold goods, nearly EUR 630 million are destroyed each year and only EUR 140 million are donated. Textiles and shoes, for example, account for EUR 49 million of this destruction. For household appliances, the share of destruction represents EUR 10 million and for hygiene and beauty products, it represents EUR 180 million.”

Though the above figures suggest that the destruction of unsold consumer products may be a comparatively minor phenomenon (i.e. when compared to the total consumption volume), its absolute magnitude remains considerable – in particular taking into account that it may be linked to the rapid growth of online sales in recent years (as the visible cases cited above may suggest).

WHAT ARE THE PROBLEM DRIVERS?

Market failures

Product-related externalities are not fully internalised

There is a market distortion in the shape of uncorrected externalities: environmental, health, or other impacts generated by a product and not reflected in its price. Policy can respond to these externalities, for example, through regulation of the characteristics of externality-generating products or activities. An alternative approach is to use economic incentives, such as subsidies, taxes, or fees, to "internalise" these products' externalities, so it is reflected in their market price. This approach uses competitive market forces to determine efficient prices, quantities and product characteristics instead of attempting to estimate and regulate outcomes.

The general background

The Functioning of the European Union (TFEU) states that: “Union policy on the environment (...) shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay”.

Policymakers can use this principle to curb pollution and restore the environment, and make sure that markets operate efficiently. By applying it, polluters are incentivised to avoid environmental damage. In economic terms, this constitutes the “internalisation” of “negative environmental externalities”. When the costs of pollution are charged to the polluter, the price of goods and services increases to include these costs. Consumer preference for lower prices will thus be an incentive for producers to market less polluting products.

The European Green Deal stresses that only by making full use of pricing and well-designed tax reforms can Europe meet its environmental objectives in an efficient and just way. Reflecting the

<https://www.itv.com/news/2021-06-21/amazon-destroying-millions-of-items-of-unsold-stock-in-one-of-its-uk-warehouses-every-year-itv-news-investigation-finds>

²²⁷ French Senate, “Étude d’impact. Projet de loi relatif à la lutte contre le gaspillage et à l’économie circulaire”. NOR : TREP1902395L/Bleue-1, July 2019, accessible at: <https://www.senat.fr/leg/etudes-impact/pj118-660-ci/pj118-660-ci.pdf>

²²⁸ LOI n° 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l’économie circulaire, accessible at: <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000041553759/>

²²⁹ Agence du don en nature, “Etude du potentiel de dons non alimentaires – rapport d’étude”, 2014, available at: <https://www.adnfrance.org/medias/publications/rapport-etude-potential-dons-non-alimentaires-2014.pdf>

European Green Deal, the European Commission is working to strengthen the implementation of the Polluter Pays Principle in European Union law.

Evidence on externalities

The cost of pollution can be valued by considering the pathways via which it leads to impacts, then calculating a figure for the cost of those impacts. An ongoing study²³⁰ estimates the degree of internalisation for pollution of air, water, and land and finds that there is a systematic failure to internalise externalities. This means that markets are distorted, with consumption biased towards products with environmental impacts.

For example, for air pollution, it suggests that the degree of internalisation is around 44% with unpriced externalities of around EUR 400 billion per annum.

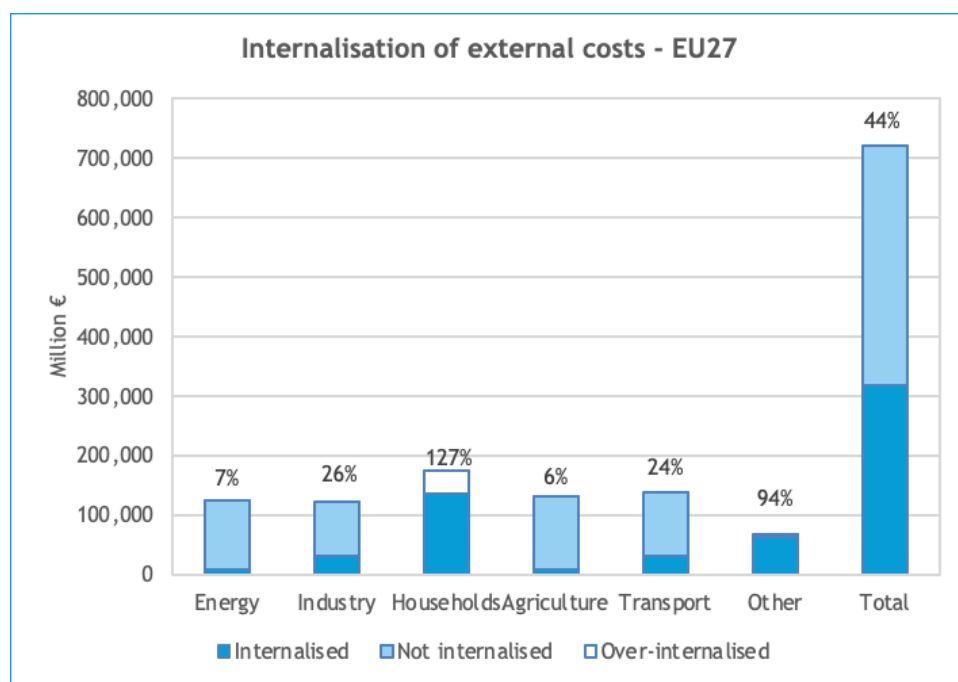


Figure 17 Extent to which air pollution costs are internalised in the EU27, 2017

This general conclusion that externalities are only partially internalised is confirmed by the European Court of Auditors Special Report: “The Polluter Pays Principle: Inconsistent application across EU environmental policies and actions”²³¹. It finds that “Overall, we found that the Polluter Pays Principle is reflected and applied to varying degrees in the different EU environmental policies and its coverage and application was incomplete.” It recommends that the European Commission “assess the scope for strengthening the integration of the Polluter Pays Principle into environmental legislation”.

Markets for Circular Business Models are not fully developed

The limited development of markets for Circular Business Models (CBM) is directly linked to sub problem 2 (Too difficult for economic operators and citizens to make sustainable choices in relation to

²³⁰ “Green Taxation and other economic instruments: Internalising environmental costs to make the polluter pay”, IEEP et al, 2021 (forthcoming, will be published before the Summer)

²³¹ ECA, Special report 12/2021: “The polluter pays principle: inconsistent application across EU environmental policies and actions”.

products). Product design is driven by sales revenue, with concern and responsibility for post sales performance defined mostly by warranties, guarantees, liability, brand value and reputation. In the absence of regulatory requirements, standards of information requirements, product design briefs do not consider the costs (or lost savings) to consumers and society of poor performance, durability, reparability and recyclability.

A circular business model can be defined as “a business model in which the conceptual logic for value creation is based on utilising the economic value retained in products after use in the production of a new offering”²³². CBMs are designed to create, deliver and capture value whilst optimising resource usage and striving towards complete cycling of materials. This implies reduced input costs through improved resource efficiency, but also a shift in goals from making profits through the sale of products or artefacts to making profits through the flow of resources, materials, and products over time, including providing access to goods through services, reusing goods, and recycling resources.

Notably, CBMs are a subset of business models in general, and they can have overlaps with other types of sustainable business models, although not always. Some CBMs might also lead to value destruction in ecological and social terms and hence do not contribute to sustainability, for example, because of rebound effects due to efficiency gains or negative effects on supply chain partners. Within the scope of this study, we focus on CBMs that are also sustainable²³³.

CBMs are varied, and can be adopted by incumbent (primarily linear) businesses, or by new market entrants and disruptors. In some cases, the business opportunity lies in delivering circular processes (e.g. a repair shop, symbiosis scheme or recycler), operating on the fringes of linear value flows. In other cases, it can involve an existing business in adapting its product design, sourcing or post-sales services, and in others it can involve applying an integrated circular approach.

New types of circular models appear all the time as a result of business model innovation, but they have been categorised as²³⁴:

1. Circular supplies: A business model based on industrial symbiosis²³⁵ in which the residual outputs from one process can be used as feedstock for another process.
2. Resource value: A business model based on recovering the resource value of materials and resources to be used in new forms of value.
3. Product life extension: Those business models that are based on extending the working life of a product. This includes **Maintenance, Repair, Re-furbishing, Re-manufacturing**²³⁶, used

²³² Linder, M.; Williander, M. Circular Business Model Innovation: Inherent Uncertainties. *Bus. Strategy Environ.* 2015, (p.2)

²³³ A **sustainable CBM** is a business model that strives for one, or ideally several, of the following goals: 1) Employing fewer materials and resources for producing products and/or services; 2) Extending the life of current products and assets through for example design for durability, re-use, maintenance, repair, refurbishment, repurposing and remanufacturing and through producer retained ownership; 3) Increasing intensity of use of products and assets through for example sharing, symbiosis and products-as-a-service; 4) Closing the loop of products' lives by for example component harvesting, upcycling and recycling. Thus, CBMs reduce environmental and societal costs, but also boost profits and competitiveness through efficiencies, and value capture, creation and delivery.

²³⁴ A Conceptual Framework for Circular Design; Mariale Moreno, Carolina De los Rios, Zoe Rowe and Fiona Chamley Centre for Competitive Creative Design (C4D), Cranfield University (2016) at [ResearchGate](#)

²³⁵ **Industrial symbiosis** is the process by which wastes or by-products of an industry or industrial process become the raw materials for another. Examples of industrial symbiosis are wide ranging and include the use of waste heat from one industry to warm greenhouses for food production, the recovery of car tyre shavings for use in construction materials, and the use of sludge from fish farms as agricultural fertiliser. It can also comprise shared use of warehousing, machinery and office space. Symbiosis tends to happen within geographical clusters, but requires matchmaking and servicing to happen.

²³⁶ **Remanufacturing** is an industrial scale process to disassemble used products, replace worn parts, test and return them to use "as new", normally with a full warranty. It typically results in emissions and cost reductions of 80-90% compared to a new product using virgin materials. With €30bn sales across the EU, currently, remanufacturing employs around 190,000, 90% in the business to business (B2B) sector. It is estimated that in 9 sectors the market has potential to expand from €7.4 bn today to €100bn by 2030[1], generating between 450,000 and 600,000 jobs. Remanufacturing is generally carried out either by OEMs directly (eg: Dell Computers, Renault), under licence or by spin-outs from OEMs (eg: Syncreon for Lexmark), or by independent companies. In the latter case SMEs need to deal with OEM intellectual property rights and branding issues. Remanufacturing usually requires significant capital investment, from basic machine tools to high tech, and it requires guaranteed flow of core (used equipment and components).

products or product parts are disassembled, improved or replaced, to be use "as new". Such activities can be supported by **Reverse logistics**²³⁷.

4. Extending product value: Those business models based on offering product access and retaining ownership to internalise benefits of circular resource productivity. This includes **product-as-a-service**²³⁸ or servitisation, where buyers do not necessarily buy a product but rather services associated to the product.
5. **Collaborative- or Sharing economy**²³⁹ models where individual/private use of products and services turns into shared usage on a temporary basis, facilitated by online platforms and open marketplaces

To these can be added **Recycling activities**²⁴⁰ which convert waste into secondary raw materials, sometimes to higher value products through **Upgrading** or **Upcycling**. However, although an important element of the circular economy, recycling activities are rather a sector of activity than a circular business model as such, and are concerned with dealing with the end-of-life phase when a product becomes waste. Nevertheless, the quality, quantity and viability of recycling businesses is highly dependent on product design.

Current situation and forecast

There are CBM examples that illustrate the strong business case of a circular economy across many different industries and that show the many environmental and social benefits circular practices yield.²⁴¹ **The market share of CBM is relatively small**, despite the rapid growth in some known platforms, with future environmental impacts likely to remain small-scale when compared to the overall economy. CBM and traditional business models are however expected to converge. Numerous studies point to the untapped potential of CBMs.²⁴²

²³⁷ CBMs for **Reverse Logistics (RL)** support take-back, maintenance, repair, refurbishment, and remanufacturing. Reverse material flows are a prerequisite for various CBMs. Newer approaches also connect reverse flows and stock overruns with new markets, for example for second-hand retailing.

²³⁸ In CBMs based on **Product-service system (PSS)**, buyers do not necessarily buy a product but rather services associated to the product. Different degrees of servitisation, from product-related services to product-replacing services distinguish different types of PSS patterns. Major mechanisms of these patterns are a shift in incentives towards more efficient resource use and moving away from the notion of ownership. This includes use-oriented services, where the product is still central, but its ownership remains with the provider and the product is leased, shared, rented or pooled. It also includes result-oriented services, where payment is by pre-defined and agreed result, i.e. pay per service unit delivered. For example, purchasing x hectares of pest-free fields for x years instead of purchasing a predefined volume of pesticides.

²³⁹ **Collaborative- or sharing economy (CSE)** are models where individual/private use of products and services turns into shared usage on a temporary basis, facilitated by online platforms and open marketplaces. Collaborative or sharing models generally increase the use-intensity of the product or asset, compared to user-ownership, leading to reduced costs, and improved access, while leading to environmental gains. It is estimated that the collaborative economy can save up to 7% of household budget spending and reduce waste by 20% if the market operates under favourable conditions²³⁹. The collaborative economy is particularly active in transport (car sharing (vehicle-renting), ride-sharing and rides on demand), tourist accommodation (sites such as AirBnB) and consumer durables (thus, instead of buying a power drill, you rent one). It is often associated with design for durability, as the owner remains the actor putting the product on the market, but more intense use leads to shorter absolute product lifetimes.

²⁴⁰ **Recycling activities** convert waste into secondary raw materials. Waste regulations aim to ensure steadily increasing and separated feedstocks of various waste types, but investment gaps persist²⁴⁰ despite available Structural Funds. Confidence in stable future demand and prices need to be enhanced, and relative costs of landfill and incineration need to be progressively increased. For example a legal obligation to separately collect municipal biowaste (by 1st January 2024) will bring on tap far higher amounts of this feedstock. If not treated properly it will lose value and emit methane; if treated properly it will provide valuable fuel and fertiliser. Bio-refineries can capture the value of organic waste and by-products by extracting energetic or non-energetic products including biochemicals and nutraceuticals, nitrogen, phosphorus and potassium (NPK) 133, returning nutrients to soils and developing markets for biomethane. In the EU27, current capture of food waste is 9,5 million tonnes p.a. (MTPA), just 16% of the theoretical potential, estimated at 60 MTPA.

²⁴¹ *SITRA 2021 The winning recipe for a circular economy (sitra.fi)*

²⁴² Consultant's supporting study to SPI IA, Task 5; Material Economics, 2019; Material Economics, 2018; SITRA 2020; SITRA 2021

Market penetration per sector

Overall, the market penetration of new circular business models remains limited, with considerable potential remaining for scaling up such models in many sectors. The degree of market penetration varies depending on sector and depending on type of CBM concerned²⁴³. The sectoral distribution (using the Eutopia Green database) of a sample of CBMs is depicted in Figure 18 below. The energy sector reports having the largest amount of CBMs, followed by construction material and works, and means of transport (with an aggregated value of 66% of all BMs in the sample). Sectors such as furniture, high impact intermediary products (cement, chemicals, steel) and electronics & ICT have far lower CBM market penetration: 3%, 4% and 4% respectively.

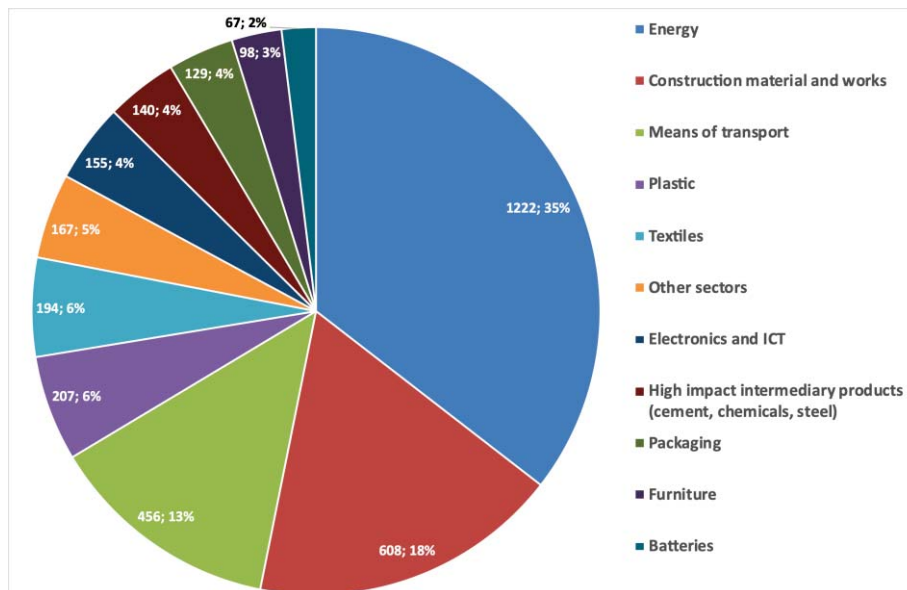


Figure 18 Sectoral distribution of 2380 European companies with CBMs in the study to support this initiative

The results from the survey collected as part of the impact assessment (see Annex 2: Stakeholder consultation) provide some additional indication on the level of market penetration of CBMs. The survey found that most SMEs were more or less equally familiar with the different new as well as established CBMs presented. One model did not stand out in particular. Respondents considered that the EU is best placed to enable and regulate product service systems (66%), reverse logistics (55%), the collaborative economy (47%) and on demand production (41%).

The survey results indicate that the two main drivers for the uptake of circular business models for sustainable products in Europe were predominantly regulations and incentives to foster innovation in sustainable products (50% agree, 20% strongly agree). Regulations and incentives also deemed to enable circular business models (52% agree, 17% strongly agree).

Barriers and drivers

Diaz Lopez et al. (2019)²⁴⁴ explore relationships between Circular Economy business model changes, and implementation barriers in 143 cases. They adopt a categorisation of implementation barriers into institutional, market, behavioural, cultural and organisational.

²⁴³ Material Economics, 2019; REF consultant's supporting study to SPI IA, Task 5

²⁴⁴ Based on Diaz Lopez, F., Bastein, T., Tukker, A. (2019) Business Model Innovation for Resource-efficiency, Circularity and Cleaner Production: What 143 Cases Tell Us, Ecological Economics, 155, 20-35

Using these categories, some examples are identified below.

Table 23 Barriers and drivers for Circular Economy Business models

| Barrier | Scope | Example |
|------------------------------|--|---|
| Institutional | Policy framework not adapted, e.g.: regulations, fiscal measures, conditions for investment | The lack of clear end-of-waste criteria excludes many remanufacturing actions as a product that has become waste cannot be put back on the market. Waste shipment rules prevent adequate feedstocks Lack of minimum standards for design make repair, remanufacturing and recycling uneconomic Labour is generally taxed more than materials as a factor input. |
| Market | Market conditions, information gaps and asymmetries, split incentives, monopolies, subsidies, relative costs of inputs | Benefits of design for durability or easy dismantling and recycling do not accrue to the manufacturer. Costs of repair of a DVD player outweigh costs of replacement. OEMs refuse to allow their products to be remanufactured by independents for reputational or IP reasons. Cheaper to landfill than to recycle. Lack of critical mass of consumer demand Reverse material flows are restricted |
| Behavioural/ cultural | Risk aversion, social norms and habits, hassle avoidance | CBMs are often excluded from public procurement by restrictive interpretation of “most economically advantageous offer”; for example not incorporating life-cycle costing, and excluding possibilities for supplying reconditioned/remanufactured products or products-as-a-service. Consumer ownership is often for “prestige” motivations, reinforced by branding and marketing. |
| Technological | Lack of equipment and tools, underdeveloped or expensive technology | Robotic disassembly and use of AI are not rolled out yet. Technologies for chemical recycling of plastic are not cost effective yet. |
| Organisational | Company structures and routines, Management, accounting and reporting systems | Accounting processes, performance measurement and bonuses are based on sales revenues, with less importance to benefits of asset retention in servitisation models. Lack of knowledge and expertise in circular approaches. |

These barriers can be split into those that are more internal to companies or to the practices of individuals, over which companies have some control, and external barriers, over which they have little control, and where policy intervention would be required to unlock circular potential. In reality the distinction is often overlapping, in that for example accounting, reporting and management practices will be influenced by accounting and tax rules.

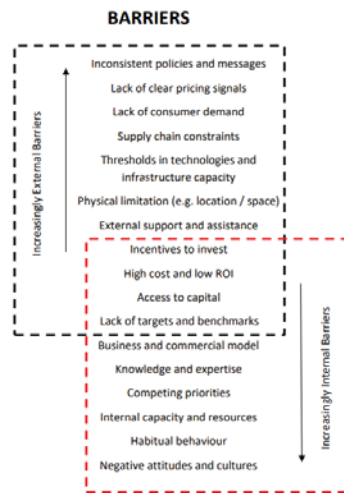


Figure 6.1: Barriers to business becoming more resource-efficient. Source: Adapted from AMEC and BioIS (2013), Figure B9, p.83

Figure 19 Barriers to business becoming more resource efficient

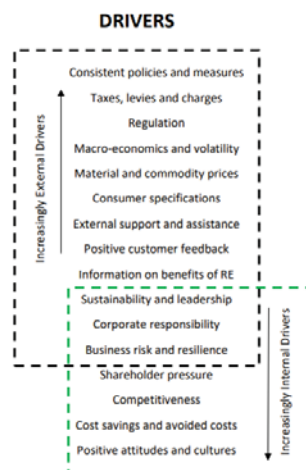


Figure 6.2: Drivers to stimulate businesses to become more resource-efficient. Source: Adapted from AMEC and BioIS (2013), Figure B9, p.83

Figure 20 Drivers to stimulate businesses to become more resource-efficient

Amongst the potential external drivers for CBMs, several respond directly to the barriers set out in the previous figure. For example, consistent policies and measures, and the use of taxes, levies and charges, and of regulation, to address a lack of clear pricing signals. Policy makers can also assist with providing information on the benefits of resource efficiency and the circular economy. Customer specifications and positive customer feedback in support of circular economy practices and products are clearly external to businesses, but would themselves be dependent on other broader social trends, within which governments could play a role.

An important general observation arising from considering these internal and external barriers and drivers, is that barriers and drivers are frequently not isolated, but operate in a context, and in combination with other drivers and barriers, both internal and external. This is why Kemp et al

(2014)²⁴⁵ develop the concept of the ‘web of constraints’ – and a corresponding ‘web of drivers’ – rather than considering individual barriers and drivers operating independently.

A study by SITRA²⁴⁶ points out four categories of barriers to further application of CBM: cultural, technological, market and regulatory. The interrelatedness of these four categories of barriers can result in a chain reaction towards circular economy failure, with the economy then remaining in its current business-as-usual.

Figure 2. Categories of Circular Economy Barriers

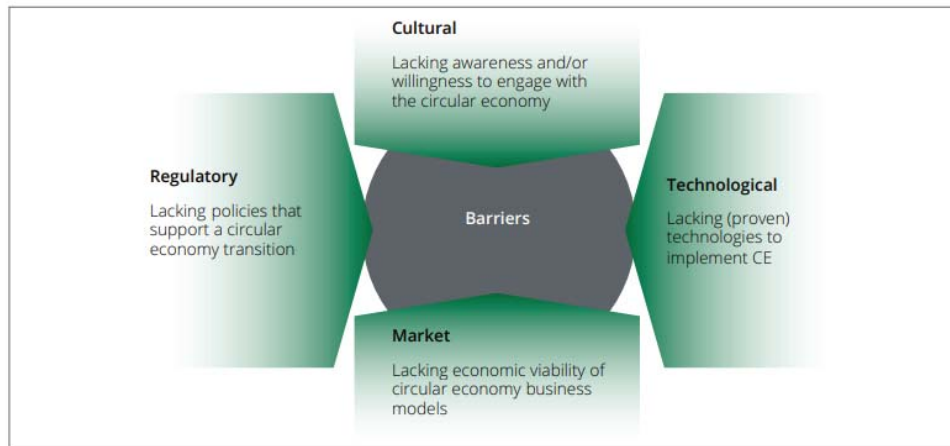


Figure 21 Categories of circular economy barriers

These four types of barriers are interrelated. For instance, a business with a company culture hesitant towards circular economy will not develop circular designs. **Hence, consumers will lack awareness and interest regarding circular designs since none of these are offered in the market.** This means that cultural barriers can induce technological barriers which induce further cultural barriers. Another example regarding interrelatedness are regulatory and **market barriers**. For instance, limited circular procurement can result in **limited funding for circular business models** since circular firms may not be able to demonstrate convincingly that there is a market for their products in the absence of such procurement. This, in turn, may further undermine the development of a global consensus among policy-makers regarding transitioning towards circular economy since convincing use cases are missing. Hence, regulatory barriers can induce market barriers which induce further regulatory barriers. This analysis is underpinned by a study of the Circular Economy Initiative Deutschland²⁴⁷, which analysed the barriers to development of circular business models in the area of maintenance and upgrading, repair, reuse, remanufacturing, and recycling. On the **demand side**, amongst other barriers the study highlighted the inhibiting role currently played by **price** (as, in some cases, carrying out a value-retaining operation such as repair costs a similar price/is more expensive than purchasing a new product), as well as by **geographical or structural distance** between providers and users (which leads to increased ‘hassle costs’). On the **supply side**, amongst other barriers the study identified **lack of access to spare parts, information asymmetries²⁴⁸, low profitability margins,**

²⁴⁵ Kemp, R., Dijk, M., Domenech, T., Wieser, H., Bahn-Walkowiak, B. Weaver, P. (2014), Synthesis Report and Conclusions about Drivers and Barriers, POLFREE Deliverable 1.7. Available at: <https://www.ucl.ac.uk/polfree/publications/publications-2014/1.7.pdf>

²⁴⁶ SITRA, 2020 [Rethinking ownership \(sitra.fi\)](https://www.sitra.fi/)

²⁴⁷ acatech/Circular Economy Initiative Deutschland/SYSTEMIQ (Eds.), 2020, Circular Business Models: Overcoming Barriers, Unleashing Potentials, https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/608a9b723926032d9f74aea2/1619696523596/GM_Gesamtbericht+EN

²⁴⁸ e.g. for repair and maintenance businesses: lack of access to products’ repair and maintenance information; for recyclers: insufficient information about material composition, recyclability and toxicological characteristics of materials

difficulties in accessing relevant funding (due to perceived lack of solid business cases), and **competition** (e.g., in the case of recyclers, from well-established virgin materials industry and value chains).

Results from the survey as part of the impact assessment also uncovered some barriers relating to the development of CBMs. When asked to list the main barriers to the successful deployment of more circular business models, a clear regulatory framework, the profitability of business models, and consumer awareness and responsiveness were considered to be the most important barriers. A lack of technical skills and the support provided by banks and investors willing to provide funding was considered much less important.

In the particular case of the CBM relating to the sustainable manufacturing of products, barriers highlighted by respondents referred mostly to the difficulty in obtaining trustworthy information on the social conditions of work along the supply chain, as well as the environmental conditions of processing along the supply chains. The ability of obtaining certificates of good environmental or social credentials were considered a much less hampering factor.

Table 24 Link to identified Policy Options

| Driver | Related Policy Option (SPI) | Other related EU policies |
|---|---|--|
| Consistent policies and measures | Single market basis of Ecodesign, | Value-chain approach of CEAP |
| Taxes, levies and charges | promotion of eco-modulation of EPR, and potentially enabled via DPP | EU competence limited, |
| Regulation | Ecodesign, non-destruction of unused goods obligation, take-back obligation | Waste regulation, chemicals regulation, Consumer regulation (right to repair, green claims), |
| Material & commodity prices | | CRM Action Plan Raw Materials Initiative Innovation Partnership, Strategic Partnership |
| Consumer specifications | Ecodesign and DPP | |
| External support and assistance | Guidelines on supporting CBMs, EIC funding and accelerator, Hub | EEN advisory services (SME Strategy) |
| Positive consumer feedback | DPP | |
| Information on benefits | Guidelines, Hub, DPP | Stakeholder platform |

Imperfect Information: economic actors lack reliable information on product sustainability

There is often imperfect communication in the supply chain about a product’s energy, environmental and social sustainability information, both from downstream actors (end-users and recyclers) up to product designers, and from product manufacturers downstream to end-users and recyclers. This leads to observed market failure in terms of sound economic purchasing decision because of:

- Lack of information for end-users on the efficiency of products;
- Lack of incentives to base purchase decision on factors other than direct performance (“suboptimal economic behaviour” of the users);
- Myopia of cost calculation, i.e., not assessing the Total Cost of Ownership (TCO) and instead solely relying on purchase price, especially in the case of SMEs or lower income households;
- Split incentives within companies due to the separate budgets for purchasing and running costs;
- Lack of communication between the designers and the actors in the supply chain involved in repair, refurbishment and end-of-life treatment.
- User preferences for selecting specific brands of equipment and ancillary materials (e.g. tradition).

Overall, there are multiple reasons why economic actors do not rationally choose the products which are the most cost-effective over the product's lifetime. In several cases companies and households are less likely to undertake energy or resource saving measures, even if they would have the same economic viability as other investments. Moreover, as seen in the section dedicated to the sub-problem 2, the lack of information on the sustainability of products along the supply chain leads to missed opportunities for value-retaining operations and affects the demand and market competition for more sustainable products and material.

These market failures could to some extent be tackled by reliable information on product sustainability: for example on whether one product is more resource efficient during its use phase than another. Such information is often not obvious for consumers who often lack information on products' sustainability including information on the environmental characteristics of products, expected or guaranteed lifespan of products, the availability of repair services, spare parts and repair manuals; and the software update/upgrade policy concerning the product. These parameters are considered²⁴⁹ as the most relevant to help consumers assess a product's environmental sustainability.

An increasing number of consumers are interested in sustainability, with the majority of EU consumers being “occasional” consumers of environmentally-friendly products (56%) and more than a quarter paying attention to the environmental impact of all or most goods and services (23%). 67% EU citizens buy products that are better for the environment even if they cost more²⁵⁰. 43% of EU consumers declared that they would be willing to pay for environmental information²⁵¹, and 56% of consumers would use the information to buy “more environmentally friendly products”²⁵². Consumers say they look actively for information about the environmental characteristics of products²⁵³, such as their environmental impacts or performance. However a large number of them find that the existing information is simply insufficient^{254, 255}.

²⁴⁹ Based on European Commission, *Behavioural Study on Consumers' engagement in the circular economy*, October 2018 as well as the Impact Assessment for the green Claims Initiative [add reference when published].

²⁵⁰ *Consumer conditions survey*, European Commission, 2021.

²⁵¹ Data extrapolated from the consumer survey in the framework of the impact assessment on Consumer Empowerment initiative [add reference when published].

²⁵² Impact assessment on Consumer Empowerment initiative [add reference when published].

²⁵³ Half of the respondents look for environmental information on the packaging when purchasing a product.

European Commission, *Consumer Market Study on Environmental claims for non-food products*, 2014, p. 75.

²⁵⁴ 60% of consumers found it difficult to determine the environmental impact of products, mostly because the information was not available or not clear or that consumers were unaware that such information existed.

European Commission, *Flash Eurobarometer 367*, 2013, p. 73.

Currently, evidence suggests that 26% to 40% of consumers²⁵⁶, i.e., 74-150 million consumers, would use information to buy “more environmentally friendly products”. Consumers would be on average willing to pay between 2.25% and 4.25% (depending on the product-type) more for an identical product, presented as environmentally sustainable²⁵⁷.

Currently, these issues hamper effective support for buyers’ decision-making based on environmental performance. For example, information could favour certain product characteristics, despite increasing impacts on other environmental indicators (e.g. optimising for climate change but worsening water use) and would omit information on what environmental issues are truly relevant for the product or company.

Even for consumers less interested in sustainability, there are good economic reasons for favouring products with higher sustainability because of savings over the use period (such as energy savings) or longer durability.

In response to this market demand by consumers, businesses, investors, and public administrations for environmental information, green products and services, environmental performance has become a competitive and differentiating factor. This has driven a proliferation of methods and initiatives and boosts the number of claims. However, claims, labels and initiatives can be based on different, inconsistent methods, with a varied level of reliability and coverage. Coverage may be different on environmental impacts (e.g. climate change only) or elements in the supply chain covered (e.g. whole supply chain, use phase or end of life phase only).

In response, there is an increasing effort to ensure that information on the sustainability performance is reliable, credible, and clear. This can be seen in the use of labels such as Energy Labels, EU Ecolabel and the initiatives to improve the clarity of green claims (the accompanying proposals on consumer empowerment and the use of PEF/OEF to substantiate green claims). These initiatives will contribute to tackling the problem, but will not remove it²⁵⁸.

Lack of incentives to produce more sustainable products and retain value

All of these market failures lead to a lack of incentive for producers to produce more sustainable products. Why do so if the market will not properly reward sustainability, and you do not need to pay for pollution.

This also feeds through into a lack of incentives to ensure an optimal “expected lifespan” of goods (i.e. years of life, hours of use, number of cycles etc.) Information about the “guaranteed lifespan” is only available when a commercial guarantee of durability is offered by the trader (corresponding to the number of years covered by the commercial guarantee). Research shows that while consumer products are regularly offered with a commercial guarantee,²⁵⁹ the information on such commercial

²⁵⁵ 85% of respondents to the OPC & targeted consultations carried out in the context of this study reported being unsatisfied or only partially satisfied with the environmental information available to them, due (among other factors) to the fact that such information is generally not sufficient to support consumer decision-making.

European Commission, *Sustainable Products in a Circular Economy - Towards an EU Product Policy Framework contributing to the Circular Economy*, 2019, p. 66.

²⁵⁶ Varies depending on the sources and consequently on the methodology used. For instance, see:

Plank, A., & Teichmann, K., *A facts panel on corporate social and environmental behavior: Decreasing information asymmetries between producers and consumers through product labeling*. Journal of Cleaner Production, 177, 2018, p. 868-877.

Binnering, A.S., Robert, I., Ourahmoune, N., *Etiquettes environnementales et consommation durable: des relations ambiguës en construction*. Revue de l'organisation responsable 9, 2014, p. 5-24.

²⁵⁷ European Commission, *IA supporting study*, forthcoming.

²⁵⁸ Please see Annex 14 for more details.

²⁵⁹ In 66% of the mystery shops at least one commercial guarantee was offered (38% of which were included in the price of the product). The most common duration of a commercial guarantee was 36 months (30%). European Commission, *IA supporting study*, forthcoming.

guarantees, and the way how consumers are being charged, is often unclear, imprecise or incomplete²⁶⁰.

Producers also face weak incentives to manage this lifespan, through repair services, spare parts and repair manuals of goods as well as on the software update/upgrade policy. This links to a lack of information for consumers²⁶¹.

Indeed, there can be a perverse incentive to design in early obsolescence, meaning that a product cannot be used for the expected purpose and breaks earlier than expected²⁶². Several types of ‘early obsolescence’ practices can be identified, such as planned obsolescence or built-in obsolescence, premature obsolescence, indirect obsolescence, incompatibility obsolescence, etc.²⁶³. A few of these are intentional, whilst others are allowed to happen.

Moreover, in the absence of adequate requirements and incentives, low virgin material prices continue to be a dissuasive barrier to increased sustainability for many companies, as do fears that engaging in circular practices will increase product prices, resulting in loss of customers²⁶⁴.

Regulatory and administrative failures

Insufficient EU regulatory framework for sustainable production and consumption

Bringing more sustainable products to the market is currently hampered by the lack of a harmonised regulatory framework in the EU.

As outlined in the introductory section, there is currently no overarching, integrated EU policy instrument capable of covering the sustainable production and consumption of all products and/or the availability and reliability of sustainability information on these products. Rather, a ‘patchwork’ regulatory situation exists, which allows only certain aspects related to product sustainability and circularity to be addressed, and leaves certain highly relevant sectors (such as textiles and furniture) almost wholly unaddressed in this respect. This situation leaves room to national initiatives: EU Member States have begun to press ahead with national-level rules to foster the sustainability of the products placed on their markets. This is illustrated in the **TRIS database graph** as well as the

²⁶⁰ 50% of consumers do not possess enough information to distinguish between legal and commercial guarantees.

European Commission, *Consumer market study on the functioning of legal and commercial guarantees for consumers in the EU*, 2015, p. 77.

²⁶¹ Information on reparability aspects of goods is not provided for more than 80% of all goods in the market. This information when available is not complete nor available in a consistent way to allow consumers to compare products based on it. Information on the availability of software updates is not provided for more than 5% of the products with digital content. European Commission, *IA supporting study*, forthcoming.

²⁶² COM(2020)696 final, 13 November 2020, p. 5.

Planned obsolescence, or built-in obsolescence in industrial design, is a commercial policy involving deliberately planning or designing a product with a limited useful life so that it will become obsolete or non-functional after a certain period of time.

SWD(2016) 163 final, p. 75.

Premature obsolescence implies that the product lasts less than its normal “lifespan”. The normal “lifespan” needs to be defined by taking into account consumers’ expectations.

Indirect obsolescence generally occurs because the components required to repair the product are unobtainable or because it cannot be repaired or substituted (e.g. batteries welded into an electronic device).

Incompatibility obsolescence occurs when a device no longer works properly once an operating system is updated, or when the software update has resulted in poor functioning of the device.

SWD(2019) 91 final.

²⁶⁴ Deloitte, Utrecht University, 2017: *Breaking the Barriers to the Circular Economy*,

https://circulareconomy.europa.eu/platform/sites/default/files/171106_white_paper_breaking_the_barriers_to_the_circular_economy_white_paper_vweb-14021.pdf

‘Table on national level initiatives’, both set out in this section. Taking this into account, as well as the growing political and legislative momentum to foster a more sustainable economy in order to address, amongst other aspects, the climate emergency, **the continued absence of overarching or harmonised rules at EU level is likely to lead to increased fragmentation of the EU internal market.**

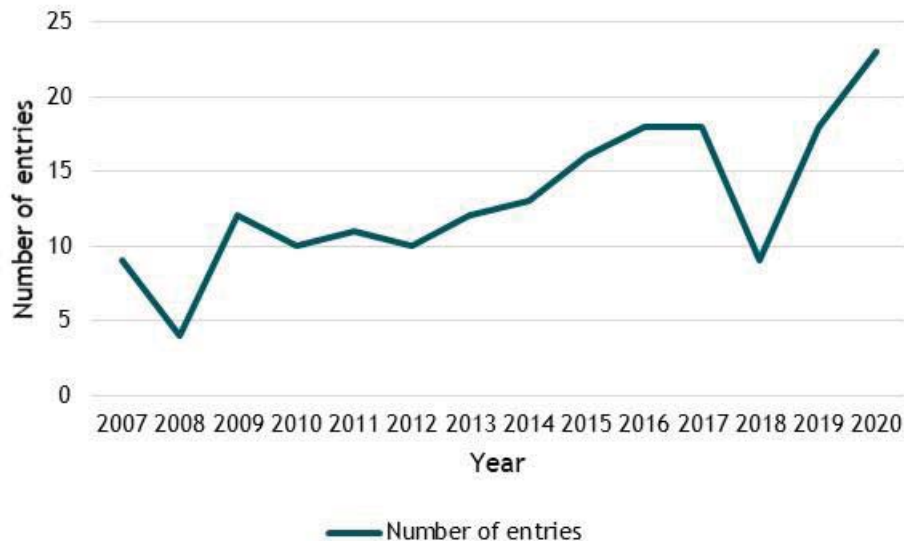


Figure 22 Number of entries per year in the Technical Regulation Information System for the product category of ‘environment’. Source: elaboration from TRIS database²⁶⁵

The Technical Regulation Information System (TRIS) database reports the legislative initiatives by Member States susceptible to have an impact on the Internal Market. **Error! Reference source not found.** above shows that there is a growing trend in the number of national environmental legislation entries that potentially have an impact on the Internal Market

Some of the initiatives recently adopted by Member States are particularly ambitious and broad in scope. For example:

- In February 2020, France adopted a “law against waste and for a Circular Economy” n°2020-105²⁶⁶. It includes requirements on washing machines (filters against the release of microplastics), a national index of reparability of products and of their longevity, information requirements on the duration of software compatibility, and 5-years plans for the ecodesign of selected value chains.
- More recently, France notified²⁶⁷ the Commission of its intention to require information on the environmental qualities and characteristics of waste-generating products to be made available to the consumer at the time of the purchase, in a dematerialised format, accessible and free of charge. The environmental qualities and characteristics in question include: reparability and durability, compostability, incorporation of recycled material, use of renewable resources, re-use opportunities, recyclability, presence of precious metals, presence of rare earths, presence of hazardous substances, traceability, presence of plastic microfibres.

²⁶⁵ <https://ec.europa.eu/growth/tools-databases/tris/en/>

²⁶⁶ <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759/>

²⁶⁷ <https://ec.europa.eu/growth/tools-databases/tris/index.cfm/en/search/?trisation=search.detail&year=2021&num=644&mLang=EN>

- Germany is planning to introduce a new label, which would include greenhouse gas emissions and raw-material consumption over the full lifecycle of products²⁶⁸.
- In the Netherlands, the government-wide circular economy programme²⁶⁹, published in 2016, set out national-level plans to utilise raw materials, products, and services in more efficient and smarter ways. The stated objective – as endorsed by companies, trade unions, governmental and other social organisations in the 2017 ‘National Agreement on the Circular Economy’²⁷⁰ – is for the Dutch economy to use 50% less primary raw materials by 2030 than it does today, and to be fully circular by 2050. The three strategic paths singled out in this agreement focus on efficient use of raw materials, replacement of non-sustainable raw materials with sustainably produced ones and **designing new production methods and products for a circular economy**. The government has clarified that its objective is to ensure that as many manufacturing companies as possible have taken steps towards circular design of their products by 2022²⁷¹. This plan includes the development of a Dutch biobased content label or certification²⁷².
- Finland published in 2019 an updated version of its Strategic programme to promote a circular economy²⁷³ with a coherent set of actions by all stakeholders in society.
- Regarding the destruction of unsold goods, several member states are developing or have developed legislation to restrict this practice. The French “law against waste and for a Circular Economy” includes a provision that producers, importers and distributors of new non-food products intended for sale are required to reuse in particular by donating or recycling their unsold products. The Spanish preliminary draft law on contaminated soil and waste includes a ban on the destruction of unsold surpluses of non-perishable products such as textiles, toys and electrical devices, unless another regulation requires their destruction²⁷⁴. The German the Recycling Management Act introduces a general ‘duty of care’ to ensure, when distributing products, also in connection with their return, that their fitness for use is maintained and that they do not become waste. More specific ordinances will follow determining the functioning of the duty of care for specific products. The German act also includes the possibility to introduce a transparency obligation requiring manufacturer to clearly document how unsold goods are handled²⁷⁵. These measures by Member States differ in terms approach (e.g. a general ban as opposed to a duty of care principle) and stringency (e.g. whether recycling of unsold goods is allowed instead of sale or donation) which leads to fragmentation from diverging national approaches.

While such initiatives are indicative of the growing momentum at national-level to engage with circular economy practices to foster sustainable products, they risk leading to growing uncertainty for businesses, increased administrative burden and potential barriers to the development of their

²⁶⁸ As reported in an expert workshop organised by the European Environmental Agency on 22 September 2021 on the promotion of circular behaviours by consumers.

²⁶⁹ <https://www.government.nl/documents/leaflets/2016/09/22/a-circular-economy-in-the-netherlands-by-2050>

²⁷⁰ <https://www.government.nl/documents/discussion-documents/2017/01/24/national-agreement-on-the-circular-economy>

²⁷¹ <https://www.government.nl/topics/circular-economy/accelerating-the-transition-to-a-circular-economy>

²⁷² <https://kidv.nl/media/wet-en-regelgeving/uitvoeringsprogramma-circulaire-economie.pdf>

²⁷³ <https://ym.fi/en/strategic-programme-to-promote-a-circular-economy>

²⁷⁴ Search the database - European Commission (europa.eu)

²⁷⁵ The ‘duty of care’ obligations has been introduced under its ‘Waste Management and Product Recycling Act’ (Kreislaufwirtschaftsgesetz – KrWG), which has recently entered into force <https://www.bmu.de/themen/wasser-abfall-boden/abfallwirtschaft/abfallpolitik/kreislaufwirtschaft/die-obhutspflicht-im-kreislaufwirtschaftsgesetz/>

economic activities – **something businesses themselves have drawn attention to and called for action on**²⁷⁶.

Table 25 National level initiatives

The table below presents national legislative initiatives, either already adopted or in the pipeline, and which aim at addressing some of the issues identified in this Impact Assessment. This substantiates the fact that increasingly divergent approaches are being adopted across the EU, leading to further internal market fragmentation. Economic operators active across the EU internal market will have to comply with different rules and requirements varying from one Member State to another when they want to place a product on the market. This will inevitably create distortions of competition that need to be addressed by EU measures to preserve the correct functioning of the internal market (*see section 2.1 on Consequences*).

²⁷⁶ See for example ORGALIM position paper on the Sustainable Products Initiative, <https://orgalim.eu/position-papers/environment-orgalim-position-sustainable-products-initiative-0>, as well as a number of other examples set out in the *Consequences* section.

| | Durability | Reparability | Obsolescence | Environmental information | Prohibition of destruction of unsold goods |
|---|---|---|--|---------------------------------------|--|
| Enacted legislation and existing initiatives at national level | France | France, Slovenia and Finland | France and Greece | * See 'Legislative proposals' section | Germany and France |
| | Durability index | Reparability index | Ban | | Ban |
| | <p>France – Durability Index: introduced by the Circular Economy Law 2020, it will integrate/replace the Reparability Index from 2024. It obliges producers, importers, distributors or any other person placing electrical and electronic products on the market to inform consumers on reliability and robustness of a list of products to be established.</p> | <p>France – Reparability Index: The Circular Economy Law obliges producers, importers, distributors or any other person placing electrical and electronic products on the market to provide the reparability index of their product to sellers of their products or any other person requesting it. The aim is to inform consumers about the ability to repair five groups of products (televisions, smartphones, laptops, lawnmowers and washing machine)</p> <p style="text-align: center;">Information on spare parts and/or repair manuals and/or software updates</p> <p>France – Obligation to inform consumers on the availability of spare parts: The Circular Economy Law establishes that manufacturers and importers have the obligation to inform retailers on the availability or non-availability of essential spare parts and of the time period during which they will be available. It also establishes that the retailer has the</p> | <p>France – Criminalisation of planned obsolescence: Consumer Code and Law on energy transition for green growth defines and forbids the practice of planned obsolescence.</p> <p>In case of breach of this provision, the person responsible for placing the product on the market can be sentenced to two years' imprisonment and a fine of EUR 270,000.</p> <p>France – Criminalisation of intentional irreparability and deliberate obstruction of access to repair information: Circular Economy Law criminalise any technique used by the person responsible for placing the product on the market, which makes it impossible to repair or recondition outside its approved/licensed repairers.</p> <p style="text-align: center;">Provision of spare parts and repair service</p> <p>France – Obligation to provide spare parts for a certain time period: The Circular Economy Law requires producers of</p> | | <p>Germany – 2020 amendment to the Recycling Management Act: This amendment established a new 'duty of care' for producers and provided a legal basis to prohibit companies from destroying unsold goods (unless they are proven to be unusable). As part of this initiative, the government announced that it plans to develop a transparency ordinance requiring manufacturers (as well as retailers) to clearly document how unsold goods are handled</p> <p>France – Law n° 2020-105 of 10 February 2020 on the fight against waste and the circular economy: This law strengthened existing French legislation aimed at was reduction and included new objectives, tools and obligations, notably a prohibition on the destruction of unsold non-food goods, such as clothing, shoes, beauty products, books, or consumer electronics. According to the law, manufacturers, distributors, and stores with unsold goods are be</p> |

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| | | <p>obligation to inform consumers on the updates necessary to maintain the conformity of the product, how to install these updates and the consequences of refusing to install them.</p> <p>Slovenia – Consumer Protection Act: It obliges the producer and/or seller, in case of obligatory conformity guarantee for certain types of technical goods²⁷⁷ to provide information on the duration of services for maintenance of goods, spare parts, and supplementary devices (at least 3 years after the elapse of the guarantee).</p> <p>It also obliges the producer and/or seller, in case of obligatory conformity guarantee for certain types of technical goods²⁷⁸, to provide an assembly manual and a list of authorised services centres (at least 3 years after the elapse of the guarantee). This guarantee is provided on top of EU harmonised 2-year guarantee.</p> <p>Finland – Legislative ban on untrue or misleading information: the Finnish Consumer Protection legislation introduces a ban to provide untrue or</p> | <p>household appliances, small IT and telecommunications equipment, screens and monitors to make spare parts available for a minimum duration of five years.</p> <p>Greece – Provision of technical service for repair and maintenance and supply of spare parts: Consumer Protection Law establishes that the supplier (including both the manufacturer and the retailer) of new durable goods must ensure that consumers are consistently provided with technical services for maintenance and repair of these goods, as well as supply of spare parts, for at least 2 years from delivery.</p> | | <p>required to donate or recycle them instead of incinerating or dumping them in landfills.</p> |
|--|--|---|--|--|---|

²⁷⁷ Household appliances, vehicles and similar products, machines for agricultural and small-area cultivation, information technology products, sport equipment, products in the field of radio communications, audio and video technology and devices connected thereto, electro-medical devices intended for personal use, fire protection devices and wastewater treatment plants.

²⁷⁸ Household appliances, vehicles and similar products, machines for agricultural and small-area cultivation, information technology products, sport equipment, products in the field of radio communications, audio and video technology and devices connected thereto, electro-medical devices intended for personal use, fire protection devices and wastewater treatment plants.

| | | | | | |
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| | | misleading information in marketing or during the course of the customer relationship including information especially relating to 'the availability and need for maintenance, repairs and spare parts'. | | | |
| Legislative proposals at national level | <p>Belgium and Italy</p> <p>Belgium – Proposals for a Bill aiming at combating planned and premature obsolescence and increasing the possibilities of repair (9 November 2019): it prohibits producers from engaging in planned and premature obsolescence practices; it proposes to include in pre-contractual information the reparability and non-reparability of products, as well as the length of time of spare parts are available; it suggests that all products have on the surface, on the packaging, and on advertisement, an indication of the lifetime of the product and the possibility for repair in a legible, apparent and unequivocal manner. Lifespan is expressed in hours, month or years or, where relevant, in number of operating cycles. The obligation to provide information on lifespan to consumers and to ensure that the</p> | <p>Belgium, Italy, Spain and Portugal</p> <p>Belgium – Proposals for a Bill aiming at combating planned and premature obsolescence and increasing the possibilities of repair (9 November 2019): it prohibits producers from engaging in planned and premature obsolescence practices; it proposes to include in pre-contractual information the reparability and non-reparability of products, as well as the length of time of spare parts are available; it suggests that all products have on the surface, on the packaging, and on advertisement, an indication of the lifetime of the product and the possibility for repair in a legible, apparent and unequivocal manner. Lifespan is expressed in hours, month or years or, where relevant, in number of operating cycles. The obligation to provide information on lifespan to consumers and to ensure that the product does not fail</p> | <p>Belgium, Italy and Portugal</p> <p>Belgium – Proposal for a bill to address planned obsolescence and support repair economy (19 July 2019): This proposal introduces a definition of planned obsolescence and bans it. In case of breach of this provision, it provides a sanction for the producer. It also suggests the creation of a product passport, an extension of the legal guarantee to 5 years. It also provides that it can be decided to require manufacturers and importers to provide professional sellers and repairers with essential spare parts.</p> <p>Belgium – Proposal for a Bill to address organised obsolescence and support the circular economy (7 January 2020): It introduces a definition of organised obsolescence and prohibits it. If the product is considered affected by organised obsolescence, it is the producer who is deemed responsible unless the producer is established abroad, in which case the trader</p> | <p>France</p> <p>France – Proposal for a Decree on consumer information on the environmental qualities and characteristics of waste-generating products (draft notified to the Commission on 04/10/2021): This proposal concerns public information on the environmental qualities and characteristics of waste-generating products, as well as the premiums and penalties paid for environmental performance.</p> <p>The draft proposal provides that information on the environmental qualities and characteristics applicable to the products concerned shall be made available to the consumer in a dematerialised format, accessible free of charge at the time of the purchase and reusable in such a way as to allow aggregation, at least on a dedicated web page and including an application programming interface. Where</p> | |

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| | <p>product does not fail earlier than the indicated lifespan is on the producer.</p> <p>Italy – information obligation on the durability of the product (9 July 2018): This legislative proposal would introduce an obligation to inform consumers on the "guaranteed lifespan and the presumable lifespan"²⁷⁹ of products on the packaging. It is the producer who is in charge of providing the information and guaranteeing the correct durability of the product.</p> | <p>earlier than the indicated lifespan is on the producer.</p> <p>Italy – Consumer rights on lifespan and possibility of reparations at accessible prices (9 July 2018): This legislative proposal would recognise the consumer's right to be informed by producers on the possibility of reparation at accessible prices.</p> <p>Spain – Repairability index (15 March 2021): This legislative proposal consists of a classification of electrical and electronic equipment on a scale of zero to ten points awarded based on five objective criteria. Awareness-raising actions will accompany the Repairability Index. It will create an opportunity for the industry to have a new incentive for innovation in eco-design and repairable, upgradeable, sustainable technology without obsolescence.</p> <p>Portugal – reparability (4 November 2019): Legislative proposal requiring that producers and importers must ensure the availability of user's manuals</p> | <p>is considered responsible. It proposes to include in the pre-contractual information the lifetime of the products, the period during which spare parts that are essential for the use of the product are available in a visible and unequivocal way on the packaging and advertisement of the product. It obliges producers to guarantee the availability of a product's spare parts - which are essential for its use - at a reasonable price.</p> <p>Italy – Definition and prohibition of planned obsolescence (9 July 2020): This legislative proposal would define and ban the practice of planned obsolescence and introduce criminal sanctions for the producer or distributor of goods who mislead the consumers on a number of issues including planned obsolescence.</p> <p>Portugal – Promoting product durability and combating planned obsolescence (4 November 2019): Legislative proposals to prohibit planned obsolescence by producers.</p> | <p>appropriate, they may also be communicated in accordance with procedures which may be defined by order, by posting, labelling or any other legible and comprehensible device, at the time of the purchase. These arrangements will also apply for the provision of information on premiums and penalties paid for environmental performance. Finally, the present draft decree specifies the prohibition of the words 'environmentally friendly' and "biodegradable", as provided for by the AGECE law.</p> | |
|--|---|---|---|--|--|

²⁷⁹ No methodology is proposed to assess this, yet.

Implementation and enforcement deficiencies leading to sub-optimal application of the Ecodesign Directive

Evaluations²⁸⁰ of the Ecodesign Directive have concluded on its relevance and effectiveness. As such, public intervention in the framework of the Directive appears to be well designed and cost-effective²⁸¹. This is confirmed by stakeholders from national authorities, industry and civil society, who generally praise the framework for its successes. In itself, the regulatory framework does not expose any significant structural failures, even if it could benefit from adjustments based on experience and evolutions of the wider legislative framework, from the Lisbon Treaty to reviewed Market Surveillance rules, and a progressive change of consumption patterns in the recent years, with a rising role for online retail.

Nonetheless, evaluations and stakeholders unanimously point to shortcomings of the implementation and enforcement, leading to the sub-optimal application of the Directive, as presented under section 0 *Sub-problem 3: Sub-optimal application of the current Ecodesign legislation* above.

Upstream, the limitations presented above (incomplete coverage of scope, progressive enlargement of requirements to non-energy aspects, delays) have been evaluated as being driven mostly from **resource allocation constraints at EU level**, compared to an increased legislative complexity. Ecodesign is a complex process which requires extensive consultations with stakeholders from the Industry, NGOs, National authorities and EU citizens. As the number and complexity of products regulated increases, as well as the number of environmental aspects that are looked at, the overall time required to properly assess potential regulations also increases. With constant financial and human resources, even with a high degree of prioritisation on the products with the highest energy savings potential, only a limited number of products and aspects can be addressed.

In that context, the 2020 Court of Auditors report on Ecodesign pointed that some delays were to be attributed to the package approach of 2019: “In 2016, the Commission decided to adopt several implementing measures as a single package, meaning that it would adopt regulations on several product groups at once. According to the Commission, this approach helps to communicate on the overall impact of multiple product groups and better demonstrate that the policy delivers significant results. However, we found that it led to delays for those product groups that are ready earlier, until the full package is ready to be adopted, leading to further delays in an already lengthy process”.

One of the most important aspects raised by stakeholders is the lack of Commission staff and other resources dedicated to Ecodesign, as the scope and product coverage of the Ecodesign Directive has increased. The 2012 and 2014 evaluations point out that for the size of its economy, the EU commits substantially less resources to support its programme than other economies. For instance, the US expenditure is roughly 10 times that of the EU despite both having similar sized economies and similar magnitudes of benefits to achieve from optimising their equipment energy efficiency programmes. The 2017 European Parliamentary Research Service’s European Implementation Assessment on the Ecodesign Directive notes that “[m]any stakeholders agreed that there is a shortage of staff at the European Commission working on this topic and the question of staff expertise is accentuated when staff are shifted from one topic to another relatively quickly. The expertise they have acquired on highly technical subjects is all too often lost”.

The European Commission’s limited access to relevant data with regard to environmental performance and market shares of products has also been identified as a constraining factor. Data is key in the framework of an evidence-based approach to regulate products and the time it takes to access data and the reliance on stakeholder’s cooperation can be seen as a delaying factor.

²⁸⁰ Ref to CSES, Ecofys, ECA

²⁸¹ See e.g. Ecofys

The lack of appropriate standards and methodologies to implement the circularity aspects of the Ecodesign Directive has been analysed as a limiting factor of a full implementation of the Directive's potential. The 2020 Court of Auditors report on Ecodesign noted that the “depth and scope of existing preparatory and review studies exploring circular economy concepts (durability, reparability, reusability, recyclability and recycled content) varied between product groups”, explaining that this was due to studies not following a standardised methodology on the non-energy aspects. Beyond specific circularity requirements, stakeholders have also pointed to a lack of methodology and clear enforcement strategy as one of the underlying reasons for not using the provisions of Annex I of the Directive with regard to ecological profiles, which would allow to look at inputs and outputs associated with a product throughout its lifecycle.

Finally, in practice, the formulation of the exclusion from the scope of the Ecodesign Directive of “means of transport for persons or goods” has led to the exclusion of potentially important products from an environmental point of view, such as personal electric transportation means, as well as to discussions as to whether products included in means of transport were also excluded from the scope.

Downstream, limited enforcement capacities can lead to incomplete implementation. As discussed above, it has been estimated that up to 10% of potential energy savings are lost due to non-compliant products. There is a general agreement²⁸² that the level of market surveillance is too low and should be increased as it is economically beneficial for society (current investments in enforcement are estimated to be 0.05% of the value of lost energy savings²⁸³). Apart from the level of resources allocated to market surveillance by Member States, timely access to product documentation and EU Market Surveillance Authorities cooperation have been found to be key aspects that need to be addressed to enhance enforcement of ecodesign rules.

Behavioural biases

Behavioural biases – including cognitive biases – are also relevant to set the context of this initiative and need to be taken into account in possible solutions. This includes the fact that some consumers take consumption decisions based on short-term costs and disregard the long-term costs of their choices (myopic behaviour). In addition, for consumers, a transition to more environmentally sustainable choices often requires a behaviour change, which is knowingly difficult because of resistance to change and the status quo bias. When choosing between different products, consumers already have to process a lot of information relating to various product attributes, which may lead consumers to focus on less complex information and leave aside sustainability aspects.

Four types of behavioural biases have been identified as important drivers for the problems analysed above:

- Social norms: perceived obsolescence; fashion trends; fast technological changes

Previous sections of this impact assessment have demonstrated how decreasing product life spans is generating social and environmental impacts. This is partly related to brand actions to make their former models seem obsolete and influence consumers to discard their still functional technological products to get new models²⁸⁴. This is perceived obsolescence: the part of planned obsolescence that

²⁸² See e.g. European Implementation Assessment - The Ecodesign Directive (2009/125/EC), European Parliamentary Research Service, November 2017; ECOS, <https://ecostandard.org/wp-content/uploads/ECODESIGN-AS-PART-OF-CIRCULAR-ECONOMY-IMPLICATIONS-FOR-MARKET-SURVEILLANCE.pdf>

²⁸³ Ecofys final technical report p.159 referring to P. Waide et al., Enforcement of energy efficiency regulations for energy consuming equipment: findings from a new European study, Proceedings of the 6th International Conference EEDAL'11 Energy Efficiency in Domestic Appliances and Lighting

²⁸⁴ Dominique Kreziak & Isabelle Prim-Allaz & Elisabeth Robinot & Fabien Durif, 2016. "Perceived obsolescence, replacement decision and destiny of cell phones [Obsolescence perçue, décision de renouveler et destinée des produits : le cas du téléphone portable],

refers to “desirability”. Despite being functional, a product is no longer perceived to be stylish or appropriate, so it is rendered obsolete by perception, rather than by function²⁸⁵. Fashion trends as well as fast technological changes are a good examples of perceived obsolescence:

- a) The average number of collections released by European apparel companies per year has gone from two in 2000 to five in 2011, with some offering up to 24 new clothing collections each year. This has led to consumers to throw away their cheap clothing items after wearing them only seven or eight times.²⁸⁶
- b) Under the influence of “Moore’s law”, performance of microprocessors has doubled every 1.5 years since 1965, leading to low durability of electronic goods and a strong drive to replace them early to benefit from significantly increased performance at constant price. Consequently, the typical duration of use of a smartphone is 3 years only²⁸⁷. “Moore’s law” seems to have come to an end around 2020, so that it is likely that the usage duration of electronic products will increase.²⁸⁸

This driver is contributing to problem 2: Too difficult for economic operators and consumers to make sustainable choices in relation to products.

- Bounded rationality

Bounded rationality is the idea that rationality is limited when individuals make decisions, for instance when buying a product. Limitations include the difficulty to make a decision among alternatives, the cognitive capability of the mind, and the time available to make the decision. Consumers tend to act as “satisfiers”, seeking a satisfactory solution, rather than an optimal solution. Therefore, they do not undertake a full cost-benefit analysis to determine the optimal purchasing decision, but rather, choose an option that fulfils their adequacy criteria²⁸⁹.

Bounded rationality can explain why even well-informed consumers do not act rationally when making purchasing decisions.

This driver is contributing to problem 2: Too difficult for economic operators and consumers to make sustainable choices in relation to products

- Myopic behaviours

A behaviour can be defined as myopic when it is based on the pursuance of short-term results, leading to actions focussed on what one wants now, without taking into account future consequences. Consumers act myopically when they to overvalue the reward received immediately and undervalue the price to be paid in the future. When consumers compare present costs with future benefits, there is sometimes a tendency to select the option that appears most advantageous (e.g. financially) in the present moment. An example of this can be “consumer discount rates”, where the discount offered may lead consumers to make purchases on the spot that do not in fact make sense (e.g. financially) over the longer term. By extension, considering their frequent preference for the present, consumers

²⁸⁵ Annie Leonard, “The Story of Stuff”

²⁸⁶ EPRS | European Parliamentary Research Service – January 2019 “Environmental impact of the textile and clothing industry. What consumers need to know”. https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI%282019%29633143

²⁸⁷ EEB (2019) Cool products don’t cost the earth - full report. www.eeb.org/coolproducts-report

²⁸⁸ David Rotman “We’re not prepared for the end of Moore’s Law”. MIT Technology Review, February 24, 2020 <https://www.technologyreview.com/2020/02/24/905789/were-not-prepared-for-the-end-of-moores-law/>

²⁸⁹ Campitelli, Guillermo; Gobet, Fernand (2010). "Herbert Simon's Decision-Making Approach: Investigation of Cognitive Processes in Experts". Review of General Psychology.

may also be less likely to purchase more sustainable products, such as energy-efficient appliances²⁹⁰, unless their advantages are readily comprehensible, in a manner that also facilitates comparison. Even when consumers have sufficient information, they can be discouraged by high upfront costs when buying a more performing product, while the benefits accrue over a longer period of time (i.e. during its use-phase). Consumers may not take into account the use cost of a product but focus on the purchase price only. On top, consumers can often not tell whether a product is more resource efficient during its use phase than another.

This driver is contributing to problem 2: Too difficult for economic operators and consumers to make sustainable choices in relation to products

- Linear production and consumption patterns are the default options

The transition to more sustainable production and consumption patterns and levels requires changes in mainstream business models. These are typically based on linear production processes and the throwaway mentality, generating the problems highlighted in the main problem definition section above. Alternative business models are often based on ideas of circular flows of products and materials, in both production and consumption phases (see *section 0Markets for Circular Business Models are not fully developed*, above). Consumers are crucial in the success of these models, but they are still locked-in linear production and consumption patterns, which are in the vast majority of cases the default options²⁹¹.

Convenience is a major driver of purchasing decisions. According to a recent study, 93% of consumers in the United States have refrained from a purchase due to convenience issues²⁹². In the United Kingdom, 76% of consumers state that convenience is their key priority in selecting a retailer²⁹³. Circular Economy purchasing options rate badly when assessed on a convenience scale: maintenance, repair, returning a rented product to its owner after having reviewed it for defects, purchasing second-hand products, sorting one's waste are time-consuming actions. Linear economy options, along the purchase – use – dispose model, are comparatively much easier and less time-consuming to implement, and represent often the default option for the hurried consumer under strong time constraints.

This driver is contributing to problem 2: Too difficult for economic operators and consumers to make sustainable choices in relation to products as well as to the part of the main problem linked to EU economy being too linear.

HOW WILL THE PROBLEM EVOLVE?

This section shows how the problems identified in the previous chapter will evolve in the absence of any EU policy intervention on environmental product policy, as foreseen in the Sustainable Product Initiative.

As illustrated above in *Figure 4: Environmental impacts of EU consumption footprint along time, compared to population, GDP, DMC and resource productivity*, all categories of environmental consumption footprint have grown faster than population over the years 2010-2017, meaning that the consumption footprint per capita has increased. The average “single score” has risen by 9% over these 7 years, i.e. at ca. 1%/year, whereas “ozone depletion” rose more than any other impact category by

²⁹⁰ Richard G. Newell and Juha V. Siikamaki (2015) “Individual Time Preferences and Energy Efficiency” NBER Working Paper No. 20969, February 2015, JEL No. D9,H43,Q41,Q48, https://www.nber.org/system/files/working_papers/w20969/w20969.pdf

²⁹¹ Edbring, Lehner, Mont, Exploring consumer attitudes to alternative models of consumption: motivations and barriers, *Journal of Cleaner Production*, Volume 123, 2016,

²⁹² National Retailer Federation. Winter 2020 Consumer View. <https://nrf.com/research/consumer-view-winter-2020>

²⁹³ Linnworks “The effortless economy. A new age of retail” (2021): <https://www.linnworks.com/the-effortless-economy>

more than 20% and “mineral resources depletion” less than any other impact category but still by 2.5% and above population (by 1.5%). This worrying trend has even been accelerating over the years 2016 and 2017. Whereas it is likely that the COVID-19 crisis may have temporarily interrupted this rise, so that the figures for 2020 (yet to be published) may appear better, these figures show that, under normal economic circumstances, and in the absence of any further EU policy, **the consumption footprint per capita of EU citizens will continue increasing.**

As was seen in the section dedicated to the main problem, the EU consumption footprint per capita of non-food Baskets of Products (Appliances, Housing, Household goods, Mobility) exceeds the planetary boundaries several times: 7.3 times for climate change, 4.9 times for particulate matter, 3.8 times for resource use – fossils. Considering the uninterrupted rise in the environmental consumer footprint in the EU, this **transgression of planetary boundaries by the EU consumption footprint will remain and even aggravate without more targeted EU policies addressing the life cycle impacts of consumption.** The transgression of these planetary boundaries will, according to the available scientific evidence lead to *“deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental-scale to planetary-scale systems”*²⁹⁴.

In the specific case of climate change, the rationale for EU action is set out in the European Green Deal Communication of 2019²⁹⁵ as well as in analysis supporting the 2018 *Clean Planet for All* communication²⁹⁶ and 2030 Climate Target Plan²⁹⁷. Political agreement has already been reached on enhanced greenhouse gas reduction targets for 2030²⁹⁸, and on a European Climate Law²⁹⁹ which sets the objective of climate neutrality by 2050 and the direction of travel towards it. Further proposals to meet these objectives are contained in the Fit for 55 Package³⁰⁰. Options in the context of the Sustainable Product Initiative can help contribute to meeting these objectives (and potentially reducing the cost of doing so) by identifying additional ways to reduce emissions along the different value chains.

Linear vs. Circular model

As stated in the chapter above describing the problem, “at present the EU economy is still far from being circular and progress towards this goal remains slow”.

The circular material use rate has been constantly growing over the last years, but remains very low (11.8% in 2019)³⁰¹. At the rate of improvement observed over the years 2004 to 2019 (a 3.6% increase in 15 years), and in the absence of any more ambitious EU policy, more than 150 years would be needed to reach a circular material use rate of 50%, admittedly still far from a fully circular target of 100%.

Similarly, the recycling rate of all waste excluding major mineral waste reached only 56% in 2016³⁰², with an average gain of only 2 percentage points in 6 years. If this trend were continued in the absence of any more ambitious policy, 132 years would be needed to reach a recycling rate of 100%.

²⁹⁴ <https://www.stockholmresilience.org/research/planetary-boundaries.html>

²⁹⁵ Communication, *The European Green Deal*. COM(2019) 640 final

²⁹⁶ A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy. COM(2018) 773 final

²⁹⁷ The 2030 Climate Target Plan: Stepping up Europe’s 2030 climate ambition Investing in a climate-neutral future for the benefit of our people. COM(2020) 562 final.

²⁹⁸ European Council Conclusions, 10-11 December 2020

²⁹⁹ Available at <https://www.consilium.europa.eu/en/press/press-releases/2021/06/28/council-adopts-european-climate-law/>

³⁰⁰ COM(2021) 550 final

³⁰¹ https://ec.europa.eu/eurostat/databrowser/view/cei_srm030/default/line?lang=en

³⁰² Last available data. Eurostat: Recycling rate of all waste excluding major mineral waste [CEI_WM010] https://ec.europa.eu/eurostat/databrowser/view/cei_wm010

Social impact of production

The 2021 report³⁰³ of the ILO and Unicef on **child labour** indicates that the number of children in child labour has **increased** by 8.4 million children (i.e. 5%) compared to 2016, and reaches 160 million worldwide in 2020 (including 63 million girls and 97 million boys). This evolution, which contrasts with decades of previous improvement, illustrates how fragile the progress towards improved living and educational conditions for children can be.

Similarly, the evolution of the situation regarding two major Fundamental Conventions of the ILO, namely the **freedom of association**, the **right to organise** and the **right to collectively bargain** is negative. The yearly Global Rights Index by the International Trade Union Confederation³⁰⁴ on labour and human rights showed that in 2020, the number of countries:

- violating the right to collectively bargain **increased** from 115 (or 62.5% of total number of countries investigated) to 144 countries (80% of total);
- excluding workers from the right to establish or join a trade union, and hence violating the freedom of association and the right to organise, **increased** from 109 in 2014 (58% of total) to 144 (or 74% of total);
- impeding the registration of trade unions, **increased** from 86 in 2019 to 89 countries in 2020.

In the absence of EU policy, **it is likely that these negative evolutions will continue, further deteriorating the social impacts** of the production supplying the EU Internal Market for non-food products.

As stated above, since the late 1980s, the lifespan of consumer products has generally decreased³⁰⁵, and in recent years the lifespan of many types of products has become progressively shorter³⁰⁶. This reduction in the lifespan of consumer products is related to general trends in the design of products, which generally aim at a reduction in manufacturing costs: integration of functions into fewer, more complex parts, under the concept of “Design for Assembly”³⁰⁷ or the increased usage of composite, blended or alloyed materials that combine the quality of their components³⁰⁸. Integrated, complex parts are more difficult and costly, and often impossible, to maintain or repair. Similarly, because of the intricate mix of materials that compose them, they are difficult, costly or even impossible to recycle. This latter observation is also valid for composite, blended or alloyed materials. In the absence of EU policies regulating the design of products, these design trends will continue developing, under constant pressure to reduce costs of manufacturing.

As stated in the Impact Assessment report on Green Claims, “*the 2020 inventory of green claims on products found that 80% of webshops, webpages and advertisements surveyed contained green claims. 45% of the total were implicit claims (imagery and colours suggesting environmental benefit) and 35% were explicit claims (logos, labels and textual claims)*”³⁰⁹. In the EU, 232 environmental

³⁰³ International Labour Office and United Nations Children’s Fund, Child Labour: Global estimates 2020, trends and the road forward, ILO and UNICEF, New York, 2021. <https://data.unicef.org/wp-content/uploads/2021/06/Child-Labour-Report.pdf>

³⁰⁴ International Trade Union Confederation, “2020 Global Rights Index”, 2020. https://www.ituc-csi.org/IMG/pdf/ituc_globalrightsindex_2020_en.pdf

³⁰⁵ There are many drivers leading to a decreasing lifespan of products: the technological progress; economic factors (e.g. when the cost of repair or upgrading is higher than replacement; and psychological reasons, shaped by style, fashion or a perceived change in need). See Circular by design. Products in the circular economy (EEA, 2017).

³⁰⁶ Öko-Institut in Germany, Prakash S. e.a., 2016. Also, EEB (2019) Coolproducts don’t cost the earth -full report. www.eeb.org/coolproducts-repor

³⁰⁷ K.G. Swift, J.D. Booker “Manufacturing Process Selection Handbook”, Elsevier, 2013, <https://www.sciencedirect.com/science/article/pii/B978008099360700001X>

³⁰⁸ Ellen McArthur Foundation “A new textiles economy: redesigning fashions’ future”, 2017, <https://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashions-future>

³⁰⁹ *Environmental claims in the EU – inventory and reliability assessment*, European Commission 2020

labels are active³¹⁰ within global landscape of more than 450 environmental labels. The claims and initiatives have different, inconsistent methods at their basis”.

The fragmentation of the labelling landscape may start declining over the next years, but it is likely that this consolidation towards a limited number of dominant labels will remain slow. It is thus likely that, in the decade to 2030, the number of competing labels on the EU Internal Market will remain very high, and beyond the capacity of the consumer to cope with this complexity.

The study on Digital Product Passport supporting this Impact Assessment has identified 14 existing private initiatives that explicitly aim at supporting functions that would be part of a Digital Product Passport. This is in addition to existing EU-managed databases on products, such as EPREL and SCIP, and to a range of existing proprietary frameworks for the transmission of data along supply chains (aka. Industrial Internet of Things)³¹¹. These are the signs of an emerging, immature and fragmented market for solutions for Digital Product Passports.

In the absence of additional EU policy intervention, the three following scenarios are likely to evolve from this current situation:

- Either a fragmentation of the landscape into mutually incompatible solutions, each dedicated to the value chain of a large company or sector, or to horizontal segments of the value chain. The lack of inter-operability between these solutions leads to a loss of information at the interface between them, or to tedious, costly and error-prone transcription³¹²; or
- The dominance by a single, hegemonic solution, in a “winner-takes-all” situation, because of the self-reinforcing effects of networks built on technical compatibility standards³¹³. Considering the many precedents in the digital sector (e.g. in office productivity software, in social media, on-line platforms), it is very likely that this winner would be a digital hegemon based outside of the EU; or
- A continuation of the current lack of consistent and useful information, with its associated impact of some purchasing decisions being taken where better information would have led to more sustainable purchases and of inefficient maintenance, repair and recycling processes.

The current lack of reliable information on the environmental and social conditions under which operations are performed in the global value chains, as described in the chapter describing the problem, has been observed since the inception of the social and environmental audit model in the 1990s, with no improvement in sight. It is likely to persist if no additional EU action is taken.

Similarly, the currently existing price gap between sustainable products and their conventional, less sustainable competitors is based on a range of technical and economic features of sustainable products (longer-lasting materials, reversible assembly processes, parts and materials sourced from environmentally and socially responsible suppliers)³¹⁴. In the absence of any additional EU policy, the

³¹⁰ www.ecolabelindex.com, retrieved on 15/9/2020

³¹¹ E.g. by large corporate vendors, many of which from the US such as Amazon, PTC, General Electric, Rockwell Automation, Mitsubishi, Siemens, ABB, Schneider Electric.

³¹² As it is currently the case in the world of Computer-Aided Design – CAD software, in which at least 49 incompatible solutions exist. See an overview here: <https://www.trustradius.com/computer-aided-design-cad#products>

³¹³ Arthur, W., & Arrow, K. (1994). Self-Reinforcing Mechanisms in Economics. In *Increasing Returns and Path Dependence in the Economy* (pp. 111-132). Ann Arbor: University of Michigan Press. Retrieved March 9, 2021, from <http://www.jstor.org/stable/10.3998/mpub.10029.12>

³¹⁴ As confirmed by 86% of academics and 71% of NGOs consulted in the targeted consultation, which either “Agreed” or “Strongly agreed” with the statement: “As product-related externalities are not fully internalised, the less a product is sustainable, the less it is demanding and costly to design, manufacture, use and manage at end of life. It can hence be placed on the market at a lower price than a more sustainable alternative”. This question was not asked to manufacturers, importers or retailers.

higher cost of these features is unlikely to diminish, so that the price gap with less sustainable products will remain, resulting in a persistent disadvantage of sustainable products on the market.

In the absence of any ambitious legal initiative by the EU on the sustainability of products such as the SPI, the current fragmented situation is likely to remain:

- Requirements on the material efficiency aspects (longevity, reparability, recyclability, resource use in the use phase) of energy-related products only are likely to be progressively added to new product groups, with harmonised standards being developed to support the assessment of these criteria. However, this legal basis will not allow the introduction of additional requirements or incentives to improve the sustainability of energy-related products, such as those envisaged in the SPI (e.g. reduce the carbon or environmental footprint, incentivise circular business models, ban the destruction of unsold products), nor to extend the scope of these requirements beyond energy-related products;
- High-impact product groups, in addition to batteries for which a legislative proposal has been published by the European Commission in December 2020, are likely to be regulated regarding their carbon footprint, their recycled content, their recyclability, their reparability, the product information available in digital format, or regarding additional categories of requirements among those currently considered in the SPI. Considering that the legislative initiative for each product group will be developed and adopted independently, it is unlikely that coherence between product groups will be upheld along the legislative process, so that each legislation will have its specificities, making compliance and enforcement more difficult;
- Some aspects of the ambition of the SPI will not be met, such as the ban on the destruction of unsold consumer products, the support (through incentives) to products with a high sustainability level or to circular business models (except for those product groups which will be the subject of product-specific legislation covering such aspects).

In addition, in the absence of an EU-wide initiative on the sustainability of products, it is likely that the fragmentation of the EU Internal Market will rise, as individual Member States are already and increasingly engaging in initiatives regulating the sustainability of products, as illustrated by the evidence and examples below.

As described in the chapter on “Legal Basis”, there is a growing trend in the number of national environmental legislation entries that potentially have an impact on the Internal Market. Considering the public pressure for more environmental and social sustainability of products, it is likely, that, in the absence of additional EU policy, Member States will continue adopting legislation on the sustainability of products and thus continue the upward trend identified so far. The adoption of this legislation would of course have the merit of increasing the sustainability level of products in these Member States. However, the criteria to assess product sustainability and the requirements placed on these criteria would be adopted independently, and would result in inconsistencies between legislation applicable to products in different Member States, and hence to increased fragmentation of the Internal Market.

Considering that funding for performing inspections and laboratory testing on products is felt as being a low priority in Member States’ budgets³¹⁵, and that the consistency of Member States’ efforts on the enforcement of product legislation still appears as having room for improvement³¹⁶, it is unlikely that

³¹⁵ As stated by 67% of the Member States participants having answered the question in the targeted survey.

³¹⁶ The targeted survey questions for Member States representatives showed that 81% of the participants having answered the question state “there are gaps and inconsistencies in the data and information reported in the Communication System on Market Surveillance (ICSMS)

the gaps currently observed in the compliance rate of products with EU legislation will improve in the absence of additional EU intervention.

by Member States”, 39% that “Cooperation of the market surveillance and customs authorities of EU Member State is limited” and that “Enforcement efforts by Market Surveillance authorities are unequal among Member States”, while 59% that “Enforcement efforts by customs authorities are unequal among Member States”.

Annex 8: Why should the EU act?

LEGAL BASIS

In the previous sections of this impact assessment, certain problem issues linked to the current situation and **related to the internal market** were set out, including the fact that product-related externalities are not fully internalized (leading to an unlevelled playing field for companies attempting to implement more sustainable approaches); that the transmission of key product information is currently imperfect (meaning that supply chain actors are lacking or find it difficult to acquire a comprehensive understanding of the product's key or final characteristics, which hampers certain more sustainable activities, such as high-quality recycling); that current EU rules only partially cover sustainability aspects of products (meaning that there is no comprehensive set of requirements to ensure that all products placed on the EU market become increasingly sustainable); that (as a result of this partial coverage) various approaches at national level have begun to be adopted (leading to internal market fragmentation); and that insufficient and uneven enforcement of current Ecodesign rules has taken place.

The absence of adequate and comprehensive internal market rules, leave room for solutions to those problems, currently being developed by Member States or by industries and which contribute to the dysfunctionality of the internal market by generating potential barriers, fragmentation and incoherent approaches. In addition, in the absence of a comprehensive set of requirements defining the sustainability of products, the same product considered sustainable in one Member State might not qualify as such in another Member State. What's more, recently adopted national legislations are likely to oblige manufacturers (and retailers) operating across borders to comply with different national obligations. From information requirements on technical operations performed on refurbished electronic devices or on the duration of software compatibility in France, to reporting obligations on handling of unsold durable goods in Germany, all is there to indicate that the trend to intervene by imposing sustainability-related requirements on goods is well established. As a consequence, without EU action, an increased number of national obligations and increased fragmentation seems inevitable (please see section on *Drivers* and *Consequences* in this annex for further details).

The problems outlined above call therefore for measures based on Article 114 TFEU that aim to build an internal market for sustainable products and ensure that national initiatives do not hamper its functioning.

In addition, as set out in the CEAP, the core of this initiative is to make the Ecodesign framework applicable to the broadest possible range of products placed on the EU market and to make it deliver on circularity. The choice of Article 114 as the legal basis reflects a continuation of the approach used under the current Ecodesign Directive 2009/125/EC, which is based on Article 95 TEC (now Article 114 TFEU).³¹⁷

The objective of this initiative is to build an internal market for sustainable products and economic actors operating in it. The aim is to achieve harmonisation of requirements for products placed on the EU market to ensure that they become increasingly sustainable and that there is a common understanding of what sustainability requirements should be met for each product in scope. The

³¹⁷ In line with case law of the ECJ, the legal basis is to be determined based on the nature and content of the proposed legal instrument, regardless of the legal basis of the instrument it possible replaces. This sentence reflects a continuation of the approach used under the current Ecodesign Directive' therefore aims to communicate merely that the future instrument will be similar in nature and content (although wider in scope and richer in aspects addressed) to the current Ecodesign Directive. This means, among other things, that it is intended to be built around a free movement clause and provide for the setting of harmonised product requirements. It does not intend to say that the legal basis of that Directive is of direct influence on that of the future proposal.

initiative will create a level playing field for businesses whose (more sustainable) products will become easier for economic operators and consumers to choose from.

In addition to pursuing internal market objectives, the proposal will also pursue a high level of environmental protection, by unlocking opportunities for the circular, clean and green economy. However, internal market objectives are predominant and environmental benefits are complementary.

Moving from the objectives to the nature of the initiative, the main content of the future legal provisions is a mechanism for the setting of requirements for products to be placed on the internal market. The future legal instrument is therefore product-centred, built on a free movement clause and will contribute to the establishment and functioning of the internal market for sustainable products.

As a consequence, Article 114 is the appropriate and correct legal basis, even if other considerations (environmental and social) are decisive for the choices made within that measure.

SUBSIDIARITY: NECESSITY OF EU ACTION

The relevance of the initiative for the Union is very high because the problems it addresses are widespread across the Union territory and have the same underlying causes. What's more, moving to a more sustainable economy is a common indispensable challenge for addressing both the climate emergency and the need to boost the economic recovery of the Union by creating new markets and new jobs.

The transition to a green, circular, sustainable economy, including fostering innovative business models, products and materials requires setting binding provisions. Only EU action, by putting in place a set of common measures, can ensure the necessary level playing field for economic operators, manufacturers, importers, retailers, repairers, consumers, in terms of requirements to be met when placing products on the internal market. Without an EU-level initiative and its effective application, the problems assessed in this impact assessment would not be fully and consistently addressed across the internal market. National initiatives, while bringing certain benefits at national level, would inevitably further intensify an already pointing fragmentation of the internal market.

Member States alone would not have the possibility to enact appropriate measures without creating divergences in the requirements for economic operators, and obstacles to the free movement of products, regulatory burden and excessive costs for businesses.³¹⁸ Fragmentation of requirements, moreover, with consequent unnecessary multiplication of specific models, would inevitably increase design, manufacturing and distribution costs, and often be passed on to customers.

Member States have indeed already started to address the issue as shown *inter alia* by the steep increase of notifications for national products measures linked to environmental considerations, and by the various already adopted national legislation) setting product requirements.³¹⁹

This circumstance apart from substantiating the main condition, considered by the ECJ for the legitimate use of Article 114³²⁰, justifies the necessity of the EU action: not only to prevent the likely emergence of such obstacles but also to address a fragmentation that is already visible and to eliminate the distortions of competition deriving from it.

³¹⁸ See Annex 7, under Market fragmentation in the Problem Drivers section, the Table with excerpts from the businesses replies to the consultation on the Inception Impact Assessment that relate to the relevance of the issue.

³¹⁹ See Annex 7, under the problem drivers related to regulatory and administrative failures, the extracts from the TRIS Database and the Table on national level initiatives.

³²⁰ The likely emergence of obstacles to trade, together with the need to eliminate the related distortions of competition (Case C-376/98 *Tobacco Advertising*, paras 84-88)

Only EU action can provide the tools enabling sustainable production and consumption across the Union, and allow consumers to dispose of pertinent and reliable information about sustainable characteristics and circular features of products in whatever Member State they are purchased.

Member States alone would inevitably develop tools that would diverge and render consumer's choices more complicated. This would impede to build on the emerging sustainability concerns and patterns to boost a new circular and responsible consumption mode.

If Member States would act individually there would also be a high risk to end up with different competing systems, based on different methods and approaches, especially for cross border traded products on the internal market, likely leading to uneven awareness and information levels on the environmental performance of products across the EU and additional costs for companies trading cross border because they would need to use different methods or comply with different labelling schemes.

Also, several Member States have started to introduce national legislation on the destruction of unsold consumer products that could have different impacts on economic actors, for example storage platforms and logistics, therefore introducing market distortions. Even if the economic impacts of such a ban could not be assessed at EU level until now, the risk is real: France has already introduced a ban on the destruction of unsold goods and Germany established a new 'duty of care' for producers. More specific ordinances will follow determining the functioning of the duty of care for specific products. As part of this, the German government announced that it plans to develop a transparency ordinance requiring manufacturers (as well as retailers) to clearly document how unsold goods are handled.³²¹ The Spanish preliminary draft law on contaminated soil and waste includes a ban on the destruction of unsold surpluses of non-perishable products such as textiles, toys and electrical devices, unless another regulation requires their destruction³²². These measures by Member States differ in terms of approach (e.g. a general ban as opposed to a duty of care principle) and stringency (e.g. whether recycling of unsold goods is allowed instead of sale or donation) which leads to fragmentation due to diverging national approaches. This calls for EU action to establish harmonised measures on the internal market.³²³

Finally, in order to be effective, the market surveillance effort must be well coordinated across the EU to support the internal market and ensure a good coverage of product verification, thereby incentivising businesses to invest resources in designing, making and selling sustainable products.

For all these reasons, the EU is better placed than individual Member States to act.

SUBSIDIARITY: ADDED VALUE OF EU ACTION

There is clear benefit in setting common requirements at EU level that cover the full lifecycle of products because economies of scale are needed to attract the investment to be made.

EU action can address effectively the current problems analysed in this impact assessment (including future risks of fragmentation and barriers to the internal market), and ensure it is future proof for scientific and technological progress, industry responsiveness and consumers' growing demand for environmentally sustainable products.

³²¹ The 'duty of care' obligations has been introduced by a a 2020 amendment to the 'Waste Management and Product Recycling Act' (Kreislaufwirtschaftsgesetz – KrWG), which has recently entered into force (<https://www.bmu.de/themen/wasser-abfall-boden/abfallwirtschaft/abfallpolitik/kreislaufwirtschaft/die-obhutspflicht-im-kreislaufwirtschaftsgesetz/>)

³²² Search the database - European Commission ([europa.eu](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&code=sdg_12_8_1))

³²³ According to the Case law, such '*action intended to approximate national rules concerning production conditions in a given industrial sector with the aim of eliminating distortions of competition in that sector is conducive to the attainment of the internal market and thus falls within the scope of Article 114*' (see Case C-300/89 *Titanium Dioxide*, para 23).

With sustainability and information requirements for products set at EU level, sustainable products and circular practices and business models will be promoted in all Member States, creating a larger market and hence greater incentives for the industry to develop them.

The internal market size provides a critical mass enabling the EU to promote international standards in product sustainability and to influence product design and value chain management worldwide. Supporting measures to actively promote the uptake of these standards globally should also be envisaged.

With such rules, the EU as one of the largest economies in the world can act as a catalyser and encourage sustainable production and consumption in other jurisdictions with great benefit for people and the planet.

The proposed measures do not go beyond what is necessary to provide the regulatory certainty required to stimulate large-scale investments in the circular economy while ensuring a high level of protection of health and the environment.

The initiative will remain fully within the mandate spelled out in the Circular Economy Action Plan, and will cover only the aspects that Member States cannot achieve on their own and only where the administrative burden and costs are commensurate with the specific and general objectives to be achieved.

Given the scale and effects of the initiative, EU action is therefore justified and necessary.



Brussels, 30.3.2022
SWD(2022) 82 final

PART 4/4

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

**Proposal for a Regulation of the European Parliament and of the Council
establishing a framework for setting ecodesign requirements for sustainable products
and repealing Directive 2009/125/EC**

{COM(2022) 142 final} - {SEC(2022) 165 final} - {SWD(2022) 81 final} -
{SWD(2022) 83 final}

Annex 9: Policy Options and Measures

WHAT IS THE BASELINE FROM WHICH THE OPTIONS ARE ASSESSED?

See below

DESCRIPTION OF THE POLICY OPTIONS

Option 1 - Business As Usual

The Baseline scenario consists of a continuation of existing policies, taking into account also ongoing parallel work on related initiatives. Under the baseline, the Ecodesign Directive would continue to exist in its current form, i.e. as described in detail in *Annex 6: The current Ecodesign framework*, and with the limitations highlighted in the problem definition. The ecodesign working plan provides an indication of the implementing measures that could still be expected to be adopted in the coming years. However, because of the constraints explained in sub-problem 3, the number of new products that could effectively be regulated by 2030 will remain limited, with existing resources being rather focused on the necessary reviews of the most significant existing product regulations. In addition, a number of related regulatory instruments are likely to be revised or newly introduced (e.g. on green claims, empowering consumers, sustainable corporate governance, etc.). More details on these initiatives is provided in *Annex 14: Articulation with existing legislation and other initiatives*. While their adoption is not certain at this point, they are considered in a qualitative way whenever relevant for the policy options being assessed. Furthermore, a set of EU voluntary instruments (e.g. Ecolabel, Green Public Procurement, Environmental Technology Verification) and funding programmes for innovation, research, development, and market uptake are expected to promote innovative products and business models.

Option 2: Extension of the product scope of Ecodesign legislation

| Sub-problem | Specific objective |
|---|--------------------------------------|
| 1) Product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects | SO1: Improve products sustainability |
| 2) Too difficult for economic operators and consumers to make sustainable choices in relation to products | |

The Circular Economy Action Plan (CEAP) indicated that one of the key aspects of the sustainable products initiative would be the extension of the Ecodesign Directive beyond “energy-related products”. Option 2 follows the approach suggested in CEAP, which is based on the analysis reflected in the Inception Impact Assessment and on previous preparatory work summarised in the Commission Staff Working Document ‘Sustainable Products in a Circular Economy - Towards an EU Product Policy’¹. This SWD analysed the variety of policy tools relevant to improve products circularity. It

¹ (SWD(2019)91)

concludes that policy tools setting minimum requirements for sustainable performance of products are less widely in place than other types of policy intervention. The main pieces of legislation identified are the Ecodesign Directive, that covers only energy-related products, and the Packaging and Packaging Waste Directive. In this context, the broader approach of Ecodesign, in comparison with other product legislation setting requirements, forms an excellent basis for a framework on sustainable products². In addition, the framework already provided for some circularity provisions in product specific rules; this was highlighted in the Ecodesign Working Plan 2016-2019 and materialised in circularity provisions for a series of products in measures adopted in 2019. Thus, widening the current framework to accommodate more products and new sustainability requirements is considered reasonable. Finally, the Ecodesign Directive is widely recognised as an effective instrument for the products it covers, as mentioned in the final report of the 2014 evaluation, enjoying wide support from all types of stakeholders (industry, NGOs, MSs) and international recognition. The approach indicated in the Inception Impact Assessment was largely supported by stakeholders providing feedback on the IIA (see Annex 2, Section 1) and the same approach underpinned the questions in the open public consultation (Section 2) and in the workshops (Section 3).

Similar to the current Ecodesign Directive, SPI will establish conditions for laying down product-specific requirements in acts adopted by the European Commission. The order of product prioritisation will be decided based on clear criteria, similar to those already foreseen in Article 15 of the current Ecodesign Directive, such as their relative environmental, energy and social impacts and the related potential for cost-effective reduction of these impacts. The selection will follow a fully transparent process culminating in working plans outlining the priorities for the development of SPI measures. These SPI measures will set out product-specific requirements, following a concerted analysis of the product group in question and an impact assessment of the proposed requirements.

As noted in the introduction to this impact assessment, it excludes food and feed as defined in the General Food Law (Regulation EC 178/2002), which are addressed through the Farm to Fork Strategy³ and raw materials as final products, meaning that raw materials are included only when they are embedded in intermediate or final goods in scope of SPI.

Presented below are the three approaches to extending the scope of the Ecodesign Directive that have been retained for analysis: 2a) extension to a limited number of pre-defined (priority) products; 2b) extension to all physical goods; and 2c) extension to all physical goods as well as services.

It should be noted from the outset that, given the architecture of the Ecodesign instrument (where detailed product rules are adopted only in a second stage via implementing measures), the decision to extend the scope is not in itself expected to have a direct impact on the product sectors concerned. Rather the effects will be felt following the adoption of the SPI measures for particular products or groups of products, which in all cases will be preceded by thorough analysis, consultation with stakeholders and impact assessment.

Sub-option 2a: Extension to a limited number of priority products

Ecodesign currently covers “energy related products”. Under this sub-option, a targeted extension of its scope, to a *limited* number of priority products, is envisaged.

The products in question have been identified taking into account their **sustainability credentials** as well as their general **potential for** improvement potential from a sustainability point of view, including their circularity potential. This builds notably on the results of a scoping study to identify

² For instance, the combined Ecodesign measures have decreased GHG by 170 Mt CO₂eq (4.5% of the EU27 total emissions in 2018), entailing a EUR 60 billion saving on consumer expenditure and an increase of EUR 21 billion in business revenue in 2020. *Ibidem*

³ A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system, COM(2020)381 final

potential circular economy actions, priority sectors, material flows and value chain⁴, the European Commission Staff Working Document “Sustainable Products in a Circular Economy - Towards an EU Product Policy”⁵ and an Environmentally Extended Multi-Regional Input-Output (EE-MRIO) Analysis⁶.

Following analysis of the above-mentioned sources, a key decision criterion for inclusion of a product in the priority list was the **extent to which their sustainability dimensions are already covered, or capable of being covered, by existing EU level instruments**. While e.g. *certain* environmental impacts of some of the products included in the priority list are covered through existing EU level legislation (see *Annex 14: Articulation with existing legislation and other initiatives*), **those for which significant regulatory gaps still exist vis-à-vis sustainability dimensions have been included**.

Based on the above, this sub-option proposes to extend the scope of the current Ecodesign Directive to enable the adoption of SPI measures for the following range of products:

- **Energy related products** (including means of transport): While the continued inclusion of energy-related products under SPI would be a logical evolution of the Ecodesign instrument, the extension of this category to *means of transport* would bridge an existing regulatory gap. Despite the fact that, at the EU level, a comprehensive policy framework is in place to address aspects such as vehicle emissions and safety requirements, and more recently the labelling of tyres to highlight their performance on fuel efficiency, safety and noise⁷, the **regulatory tools to harness the remaining sustainability and circularity-related potential of this sector are still missing**: for example, taking additional action on components of transport products, such as tyres – for which no design requirements e.g. to prevent the use of materials in their design that inhibit recycling currently exist – is expected to contribute to reducing the estimated more than one million tonnes of end of life tyres being incinerated annually in the EU⁸.
- **Textiles**: Despite the negative environmental impacts being generated throughout the lifecycle of the millions of textile products consumed in the EU per year, **no EU instrument to address the product-level sustainability dimensions of these products currently exists**. Large potential therefore remains for increased sustainability and circularity in this sector, as confirmed also by public opinion⁹. In addition, while several existing and emerging initiatives are aimed at addressing the well documented concerns about the social conditions under which textiles are being produced, none to tackle the issue from a product-level perspective currently exists.
- **Furniture**: While various aspects of furniture are addressed at EU level (e.g. safety, chemical content etc.), **no specific legislation exists to cover furniture’s product-level suitability dimensions** (or for furniture in general). Taking into account that approximately 10 million tons of furniture is discarded in the EU every year, and that overall recycling rates for furniture are estimated at only 10%¹⁰ – there appears to be large remaining potential, specifically in the areas of material substitution, increased recycling and/or increased reuse or

⁴ Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains, IVM et al for the European Commission, 2014

⁵ SWD(2019)91 final

⁶ Using Exobiase (<https://www.exiobase.eu/index.php>), for further details refer to annex 4.

⁷ EU Regulation (EU) 2020/740

⁸ 2020 EuRIC Mechanical Tyres Recycling Brochure

⁹ 62% of respondents to a 2019 public consultation stated that EU policy instruments do not adequately cover sustainable design and production in the textiles sector; 72% believed that EU instruments are not sufficient in informing consumers on the environmental performance of clothes

¹⁰ Circular Economy Opportunities in the Furniture Sector, EEB, 2017

preparing for reuse, and requirements on circular design of furniture – something which public and stakeholder opinion seem to confirm¹¹.

- **High impact intermediary products:** This includes products such as steel, often used in the construction or related sectors, for which **no instrument currently covers overall life cycle performance**. While the Construction Products Regulation is currently being revised and will include reinforced sustainability requirements for construction products, certain intermediary products can be produced for areas outside of construction, and would therefore need to fall under SPI. In addition, as the revised Construction Products Regulation will also have other objectives to take into account, SPI will need to act as a benchmark for the sustainability rules it will set and intervene if needed for these products.
- **Chemicals¹²:** While EU policies are in place addressing safe use of chemicals and reducing certain environmental impacts, **their sustainability – in the sense of their circularity and material efficiency – remains under-addressed**. In addition, the availability of sustainability-related information is jeopardizing processes such as mechanical recycling processes and use of recycled material (see sub-problem 2) and remains as yet unaddressed by an EU-level instrument.

Detailed impact assessments will precede the adoption of any SPI measures for the above-mentioned products. SPI will only intervene for issues that no other instrument is addressing or addressing sufficiently. For example, for chemicals, SPI will not regulate aspects that are already covered under other frameworks such as REACH, the Waste Framework Directive and RoHS. For high impact intermediary products, as mentioned above the SPI legal framework will only be used to set specific measures for products on which CPR could not deliver high ambition sustainability requirements¹³. The adoption of the SPI Working Plan and SPI measures will be done in close coordination with other legislative frameworks to ensure complementarity.

Together, throughout their lifetime, the option 2a products are estimated to cover an additional 14% of GHG emissions, 38% of human toxicity impacts and 15% of primary energy consumption compared to the baseline as discussed in Annex 10. In total, including the baseline, the SPI would cover 63 % of GHG emissions, and 66 % of primary energy use and 60 % of human toxicity impacts resulting from European consumption.

Sub-option 2b: Extension to all physical goods

Under this sub-option, all physical products placed on the market¹⁴ can, in principle, eventually be subject to SPI implementing measures. As under sub-option 2a, SPI requirements will only be adopted when EU sectoral legislation does not provide for requirements on similar product parameters or is not efficient enough in achieving the objectives of sustainability pursued by SPI.

¹¹ From 2019 stakeholder workshops, public consultation and policy papers from the sector itself, it is clear that stakeholders are interested in developing EU policy tools in pursuit of more circular design of furniture, taking into account the whole life cycle. Respondents to the public consultation perceived an insufficient policy coverage by the EU in this sector. 43% of them consider EU policy instruments coverage of sustainable design and production of furniture as inadequate, with 54% believing the current framework is not enough developed in providing consumers with information on sustainability.

¹² Understood as intermediate products (e.g. industrial solvents) or final products e.g. such as detergents or cosmetics. Where chemicals are destined/used for food related purposes and are not considered as food or feed, they will be subject to the relevant sectoral legislation, including the future sustainable food systems framework legislation, as announced in the Farm to Fork Strategy

¹³ For the relationship between a revised CPR and SPI, please see *Annex 14: Articulation with existing legislation and other initiatives* for more detail.

¹⁴ For practical and ethical purposes, as well as to ensure coherence with other initiatives, some exceptions will nevertheless need to be made to this coverage. For example, as previously mentioned, food and feed as defined in the General Food Law (Regulation EC 178/2002) will not be covered as these products will be addressed through the Farm to Fork Strategy.

The working plan and preparatory studies for specific SPI measures would allow to prioritise products based on their estimated environmental, economic and social impacts. Based on the reasoning set out in the previous section, there is a high likelihood that the list of priority products set out in sub-option 2a would be among those addressed with first priority under this sub-option (with exact order of prioritisation to be decided based on dedicated work plans). Annex 16 sets out details on the criteria and process for prioritisation, and which would lead to a focus on those products with the most value-added first.

Compared to sub-option 2a, this sub-option would present the added value of not having to revise the overarching legislative framework should action need to be taken for new or future product categories. If a wide scope is chosen for SPI, it will be in a position to respond to novel products and future product trends, thereby avoiding the occurrence of problematic regulatory gaps in the future

Based on best current estimates, throughout their lifetime, the products considered under option 2b *could* cover an additional 16% of GHG emissions, 42% of human toxicity impacts and 18% of primary energy consumption compared to the baseline as discussed in Annex 10. In such a case, including the baseline, the SPI would cover 65 % of GHG emissions, and 69 % of primary energy use and 64 % of human toxicity impacts resulting from European consumption. It should nevertheless be underlined that, given the wide scope of this sub-option, and the possible emergence of novel products with as yet unknown impacts, the full coverage potential of this sub-option cannot be calculated with accuracy and may be higher than the above-mentioned figures.

Sub-option 2c: Extension to services

Under this sub-option, SPI is extended to services. Services represent a significant proportion of environmental impacts.

Services have been considered under a separated sub-option due to their specificities compared to physical goods. The inclusion of services must follow a different rationale from the one used for products under Ecodesign as the provision of services does not imply the transfer of a physical product. Nonetheless, service provision relies on infrastructure and products which have their own environmental and social impacts, which can be considered as externalities of the service. The selection and use of the products in the framework of the provision of services, while not necessarily impacting the quality, has consequences on the environmental and social impacts of a service. Accordingly, requirements can be set on business practices related to the provision of services.

For example, information requirements based on the performance of products used to provide the services may inform customers about the sustainability of a service. Consumers would then be able to choose the most environmentally performant services. Similarly, minimum requirements could be set on resource intensive services, setting minimum environmental performance requirements for a given output (such as cleaning of 1m² of hard floor surface) or for a standardised service (for example, cleaning of a standardised 80 m² apartment).

This option could build notably on the experience of the EU Ecolabel, which has set requirements on some services, such as indoor cleaning services or tourist accommodations and of the Green Public Procurement, which proposes criteria -amongst others- for cleaning products and services, print services and cloud services. It could also build on the EU Eco-Management and Audit Scheme (EMAS), a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report, and improve their environmental performance, which applies to e.g. banking services and travel agencies.

The extension under option 2c to services as well as all products is estimated to cover an additional 34% of GHG emissions, 66% of human toxicity impacts and 37% of primary energy consumption compared to the baseline as discussed in Annex 10. In total, including the baseline, the SPI would

cover 83 % of GHG emissions, and 88 % of energy use and 88 % of human toxicity impacts resulting from European consumption.

Option 3: Extension of sustainability requirements for products

| Sub-problems | Specific objective |
|---|--|
| <p>1) Product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects</p> <p>2) Too difficult for economic operators and consumers to make sustainable choices in relation to products</p> | <p>SO1: Improve products sustainability</p> |

As shown in the analysis of sub-problem 1, there is a need for EU product policy to influence the design of products in a way that it better takes into account environmental and social impacts over the life cycle of products, including circularity aspects. A key instrument to improve the products sustainability is to set requirements for the placing on the EU markets of products in the scope of legislation, as discussed under Option 2. The existing Ecodesign Directive provides for the setting of generic or specific requirements on the energy efficiency and other environmental aspects of energy-using products. This policy option assesses ways to complement this approach with other types of requirements, or reinforced requirements covering better the objectives of a sustainable products legislation.

Under option 3, a number of new or reinforced sustainability requirements on products would be introduced, understood as minimum requirements allowing the placing of these products on the EU market, along those aspects described in the Circular Economy Action Plan of 2020 that are related to the product's life cycle and value chain.

This policy option thus sets out potential product requirements for:

- Circularity aspects (durability, reusability, upgradability, reparability, recyclability);
- Addressing the presence of hazardous chemicals in products;
- Increasing the energy and resource efficiency of products;
- Increasing recycled contents in products, while ensuring their performance and safety;
- Enabling remanufacturing and high-quality recycling;
- Reducing carbon and environmental footprints;
- Restricting single-use products, countering premature obsolescence;
- Social aspects along the value chain.

Three sub-options on the extension of sustainability requirements for products are considered in this impact assessment. The sub-options are cumulative: measures included in sub-option 3a are also part of sub-options 3b and 3c, measures included in sub-option 3b are also part of sub-option 3c. The distribution of the envisaged measures in the 3 distinct sub-options follows this logic: sub-option 3a reinforces requirements of the existing Ecodesign Directive. Sub-option 3b goes beyond 3a by introducing the possibility of horizontal requirements, applicable to group of product (e.g. requirements on reparability). It also includes measures enabling the remanufacturing of components

and the setting of requirements on social aspects along the value chain of products - both not possible in the current Ecodesign Directive. Sub-option 3c includes all measures presented in sub-option 3a and 3b, but in addition would include the possibility to introduce explicit prohibitions on some products, based on certain criteria.

Sub-option 3a: Enhanced sustainability requirements

Sub-option 3a reinforces requirements that can already be placed on products by the existing Ecodesign Directive, but have not been fully implemented yet, and adds new requirements based on possibilities latent in that directive. As described in previous section, these requirements would be set in SPI measures specific to groups of products and detailing the parameters regulated, the thresholds required and the measurement or calculation methods.

Measure 3a.1 - Minimum requirement on the durability or reliability of the product or its components

This measure would build on existing longevity requirements under Ecodesign for LEDs and OLEDs¹⁵ and for the hoses and motors of vacuum cleaners¹⁶. It would assess more systematically the possibility and added value of setting requirements on:

- minimum life duration of use of the product (technical lifetime), expressed in relevant units (e.g. cycles, years of use for textile), differentiated according to whether the prescribed preventive maintenance operations have been performed or not; or
- minimum reliability of the product (expressed as Mean Time Between Failures), potentially differentiated as above.
- Where feasible, integration of a use-meter on the product to relate durability and reparability information to the real use of appliances (e.g. number of washing cycles, duration of use).

Measure 3a.2 - Minimum requirements on reparability and upgradability

The measure would build on existing requirements under Ecodesign on the availability of spare parts, maximum delivery time of spare parts, access to Repair and Maintenance Information for refrigerators¹⁷, for washing machines and washer-dryers¹⁸ for dishwashers¹⁹ and for electronic displays^{20,21}. It would also work in synergy with and complement related measures set to be introduced under the Empowering Consumers for the Green Transition Initiative (see *Annex 14: Articulation with existing legislation and other initiatives*).

Reinforced requirements could include:

- ease of dis-assembly and re-assembly, using standard tools: number of steps, overall duration (for end-users and for professional maintainers and repairers), qualification of personnel, capacity for operations to be automated;

¹⁵ Commission Regulation (EU) 2019/2020 laying down ecodesign requirements for light sources and separate control gears

¹⁶ Commission Regulation (EU) No 666/2013 implementing Directive 2009/125/EC with regard to ecodesign requirements for vacuum cleaners

¹⁷ Commission Regulation (EU) 2019/2019 laying down ecodesign requirements for refrigerating appliances

¹⁸ Commission Regulation (EU) 2019/2023 laying down ecodesign requirements for household washing machines and household washer-dryers

¹⁹ Commission Regulation (EU) 2019/2022 laying down ecodesign requirements for household dishwashers

²⁰ Commission Regulation (EU) 2019/2021 laying down ecodesign requirements for electronic displays

²¹ The ongoing IA on mobile phones and tablets is extensively looking at circularity aspects (in particular regarding repairs and obsolescence)

- reversibility of dis-assembly and re-assembly, so that parts remain intact and the system operational after several sequences of dis-assembly and re-assembly;
- ease of repair and maintenance: compatibility with commonly available spare parts, modular design when appropriate;
- requirements on the material efficiency of maintenance / repair, eventually with additional requirements regarding Critical Raw Materials²²;
- availability of maintenance and repair instructions.
- requirements on choice of materials and design (e.g. of textiles) in order to facilitate reuse, repair or adjustments.

Measure 3a.3 - Restricting the presence of substances hindering circularity

Existing EU chemicals legislation (particularly Registration, Evaluation, Authorisation and Restriction of Chemicals – REACH, and Classification, Labelling, Packaging, complemented via sectoral legislation) offer the legislative tools for assessing and, where appropriate, restricting hazardous substances in the EU on the basis of chemical safety considerations. SPI would continue the approach followed by the Ecodesign Directive not to set restrictions on substances on the basis of chemical safety. However, it might occur that restricting the presence of a substance in a specific product would lead to an improvement on the aspects to be addressed by SPI (e.g. recyclability, high-quality recycling, upgradability, durability, reparability. See examples and analysis in *Sub-problem 1: Product design does not sufficiently take into account environmental impacts over the life cycle, including circularity aspects* above).

SPI will therefore allow for the restriction of the use of certain substances in specific products if the main reason is to improve a product’s performance in terms of the sustainability aspects addressed by SPI and not to improve chemical safety (although this could be a secondary effect of the restriction). Where the main reason for a restriction is to improve chemical safety, REACH (or another relevant chemical safety legal instrument) would continue to be used. The SPI could, for example, promote the substitution of substances in existing products known to hamper recycling by banning or imposing a maximum concentration in future products. Such restrictions would be based on a thorough analysis of the sustainability (including chemical safety) of the identified alternative(s), and should not negatively affect human health or the environment in a significant way.

However, where the SPI process leads to the consideration of a potential restriction on the use of substances in electrical and electronic equipment (EEE) covered by the RoHS Directive²³, and where such a restriction can be defined as contributing to “environmentally sound recovery and disposal of waste EEE”, there could be overlap with measures taken in application of Article 6 of the RoHS Directive. This should be avoided, and therefore close coordination between the two instruments will take place to prevent overlaps.

Measure 3a.4 - Minimum requirements on recycled content on the product or its components

The use of secondary raw materials (i.e. materials coming from the recycling of discarded products) is essential to close the loop on these materials, provide markets for recycling activities and reduce the need for raw materials. To accelerate the increase in use of secondary raw materials, this measure

²² https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en

would require a minimum proportion of such materials (or ‘recycled content’) in the products placed on the EU market, their components or the materials used.

Such requirements may be set on specific materials (for example a proportion of the polyethylene included in the product or in specific parts), on materials at a more generic level (a proportion of all plastics used in the product) or on all materials used in the product. The SPI measure setting the requirement would include the measurement and calculation methods to be used for compliance verification. These methods may be further detailed in harmonised standards, developed by European standardisation organisations on request of the European Commission following the approach of the ‘New Legislative Framework’.

Measure 3a.5 - Minimum requirements to reduce carbon and environmental footprints set at process and/or life cycle environmental impact(s) level

This measure is complementary to the set of measures to fight climate change adopted in the Fit for 55 package in July 2021. Those measures (especially ETS and Carbon Border Adjustment Mechanism) target the production of basic materials and basic material components, excluding final products. This measure, on the contrary, mainly addresses carbon emissions taking place along the entire value chain of final and intermediate products. Addressing also those emissions will directly contribute to the Green Deal objectives (by applying to final products, currently not in scope of Fit for 55 measures) but will also contribute to the global reduction of climate change impacts, by fostering the environmental optimisation of value chain management through footprint reduction.

Based on a complete assessment of the environmental impacts over the life cycle of a product, and assessment of the expected evolution of technologies and performance of products, this measure would set minimum requirements for the placing of the product on the EU market, resulting in a reduction of its carbon footprint or more largely its environmental footprint. Minimum requirements shall aim to reduce the most important negative impacts for a given product, without increasing the other impacts, or alternatively to reduce all negative impacts simultaneously. Hence the added value of a LCA approach.

Depending on the product and the conclusions of the assessment, minimum requirements may be set on technical parameters, on the use phase as is done under Ecodesign currently or on other processes of the product life cycle. Minimum requirements could also be set on environmental impact categories, as defined and calculated using the Environmental Footprint (EF) methods²⁴ or other methods as relevant – the impact categories being considered individually or combined through normalisation and weighting into a single score.

In the case where specific technical parameters are used, the SPI measure setting the requirement should include the measurement and calculation method and the level required. Tests and measurement methods may be further detailed in harmonised standards, developed by European standardisation organisations on request of the European Commission following the approach of the ‘New Legislative Framework’. A harmonised methodology for the calculation of the environmental footprint exists already and corresponds to the Product Environmental Footprint and Organisation Environmental Footprint methods developed by the European Commission and adopted in the

²⁴ Product Environmental Footprint (PEF) and Organisation Environmental Footprint (OEF) are methods developed by the European Commission and adopted in the Commission Recommendation (2013/179/EU) of 9 April 2013 on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations. The PEF establishes a common methodological approach for quantifying the life cycle environmental performance of any product or service. It comprises 16 impact categories (Climate change; Ozone depletion; Human toxicity, cancer; Human toxicity, non-cancer; Particulate matter; Ionising radiation, human health; Photochemical ozone formation, human health; Acidification; Eutrophication, terrestrial; Eutrophication, freshwater; Eutrophication, marine; Ecotoxicity, freshwater; Land use; Water use; Resource use, minerals, and metals; Resource use, fossils). This includes the development of product-specific rules (Product Environmental Footprint Category Rules, PEFCRs) harmonising PEF studies for specific product groups/categories.

Commission Recommendation 2013/179/EU; an update of this Recommendation is planned for adoption in December 2021. These methods can be applied in a number of policies, not only in SPI.

The SPI framework act will not pre-determine the choice of the methodology or tool to assess the environmental impacts over the life cycle of a product: this will be decided depending on the product and the typology of requirements to be included, and will be reflected in the SPI measure setting those requirements.

For this purpose, the PEF method will be the reference tool, while keeping the flexibility necessary to, at the level of the SPI measure, integrate methods or tools addressing other objectives and aspects. In the case where the Product Environmental Footprint method will be used, manufacturers could be required to perform a PEF study for each product model to prove compliance with the requirement, for example using IT-tools that would be made available by the European Commission (e.g. like the one currently under development for Photovoltaic, PV, modules). If this option is chosen, the study would follow the rules and calculation methods set in Product Environmental Footprint Category Rules, developed following the dedicated European Commission Recommendation. This is further explained in Annex 16.

Measure 3a.6 – Requirements enabling high-quality recycling

The quality of recyclates issued from recycling processes, in particular the level and composition of impurities, determines the possible uses of the recycled material. A low quality level results in the down-cycling of the material, i.e. its use for applications of lower complexity and value than the products at the origin of the recycled material. Recycling is considered of high quality if the quality of recyclates enables the use of recycled materials in the manufacturing of products of the same or similar level of complexity and value as the original products. This can be facilitated by the design choices in terms of materials, material composition of parts and assembling of parts in the final product. Improved recyclability would be particularly relevant for CRMs. EU initiatives for sustainability of CRMs should develop resilient value chains for EU industrial ecosystems and reduce dependency on primary CRMs through circular use of resources, sustainable products and innovation). Further assessments of the amount of materials in stock, i.e. contained in products that are in use, could shed light on where CRMs are present and when these would become available for recycling (also considering the average lifetime of products). Moreover, recycling systems should be adapted e.g. through standards, to better recover CRMs contained in end-of-life products²⁵.

This measure would set requirements for this purpose, such as:

- Requirement on the material composition of parts: the product must be susceptible to be disassembled into parts, each of which made of a single homogeneous material when above a certain mass (electronic components would be exempted);
- Restrictions on the variety of alloys / of textile mixtures / of plastic additives permitted for some applications (e.g. textiles) to enable high-purity sorting;

²⁵ Blengini, G.A., Mancini, L., Eynard, U., Ardente, F., Mathieux, F. JRC notes on Critical Raw Materials in MEErP. Critical discussion on past approach and proposed methodology to identify priorities (2021). (draft – to be published

Sub-option 3b: Far-reaching sustainability requirements

Sub-option 3b includes the same measures as Sub-option 3a and goes further by introducing the possibility of horizontal requirements (applying to a broad range of products). This sub-option also includes measures enabling the remanufacturing of components and the setting of requirements on social aspects along the value chain of products - both not possible in the current Ecodesign directive.

Measure 3b.1 – Adoption of SPI measures setting out requirements covering large groups of products

So far, the Ecodesign Directive only explicitly allows for setting rules for individual products, not allowing for the setting of requirements for product categories, with the exception of the stand-by regulation²⁶, explicitly provided for in the Directive, which has extended to electrical and electronic household and office equipment.

However, when looking at circularity aspects in particular, there can be merit to addressing some issues for more than one product at a time and, rather, to categories of products. Amongst others, aspects such as minimum reparability requirements, availability of spare parts, minimum recycled contents can be common to entire categories of products.

With this measure, the European Commission is mandated to design measures to be set in SPI measures applying to more than one product type, extending to product categories or even to all products covered by SPI, if appropriate. This would apply to both performance and information requirements. For example, the European Commission could propose the setting up of a reparability index for an entire category of products (e.g. “electronic products”) at once, thereby increasing legislative efficiency.

Measure 3b.2 – Minimum requirements on re-manufacturability

Re-manufacturing, understood as the re-use of parts of discarded products in the manufacturing process of the same or different products, or as spare parts in the maintenance and repair processes, is a key part of circular economy as it maintains the value of product parts, when the re-use of the complete product is not possible or appropriate, and avoids the cost and impacts of recycling. However, it is a complex operation, which can be facilitated if the original manufacturer of the products takes account of the possibility of re-manufacturing later on.

This measure, provided that the protection of trade secrets is guaranteed, may include requirements for this purpose, addressed to the original manufacturer or to the re-manufacturer, for example related to:

- Conditions for access to data for re-manufacturing: Bill of Materials, specification of parts, electric schematics, mechanical drawings / 3D printing files, and software code, which should include sufficient technical specifications (e.g. on the components or material to be used for 3D printing) to ensure the safe re-manufacturing of these parts;
- Tests and performance guarantees for re-furbished or remanufactured products, or for products proposed by professionals for re-use;

²⁶ Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment.

- Conditions placed on the licencing regime applicable for re-manufacturers, re-furbishers and upgraders of products to use technologies protected by Intellectual Property Rights:
- Maximum royalty rate applicable for the usage of the patents incorporated into the product, to be paid by the re-manufacturer to the original manufacturer after the end of the period during which the product is supported;
- Obligation placed on the original manufacturer to grant the licence to any legal or physical person, with a royalty fee complying with these requirements;

Measure 3b.3 – Requirements of due diligence on the supply chain of products

“Due diligence” refers to a requirement for companies to establish a reiterative process for identifying, preventing and mitigating certain risks. In the context of the SPI, it can be used as a tool to reduce the risk that products placed on the EU market are linked to adverse human rights impacts along their supply chain.

One element of the Sustainable Corporate Governance initiative (SCGI), currently in preparation, would be to establish a general due diligence duty for companies related to all company activities (including all relevant product value chains), applicable to companies of a certain size or generating a certain turnover in the EU. This would entail a general obligation to put in place a due diligence process including the following steps:

- identification of actual or potential adverse human rights and environmental impacts in own operations, in subsidiaries and in the value chain
- prevention and mitigation of adverse impact in own operations, in subsidiaries and in the value chain
- tracking the effectiveness of measures
- establishment of a complaint mechanism
- communicate how adverse impacts are addressed

The adverse environmental and human rights impacts covered would be specified by referencing a list of international human rights conventions (e.g. International Labour Organisation (ILO) labour conventions) and international environmental conventions²⁷. As set out in the main problem section in Annex 7 and in Annex 14, given its broad nature and scope, the SCGI will include due diligence steps applicable to a wide range of risks. Therefore, there may potentially be specific risks associated with specific products placed on the EU market to which the SCGI does not address rules tailored to the individual case.

This measure would enable the SPI to set due diligence requirements, in line with the procedure set in SCGI, in relation to specific social or human rights risks associated with specific materials, components or production processes relevant to specific products or product groups. This empowerment is intended to be used where a preparatory study identifies such specific risks and finds

²⁷ A complete list is provided in Annex 17 of the impact assessment report of the Sustainable Corporate Governance Initiative

that other instruments, including the SCGI, do not sufficiently address them. The aim is to progressively reduce the risk that products available on the EU market are not linked to human rights violations, when such risk can be clearly identified - as most relevant for products' individual supply chains.

All manufacturers or importers placing the relevant product on the EU market would have the obligation to identify, prevent and mitigate the adverse impacts identified according to concrete due diligence steps spelled out in the measure. Those steps will be adapted to the risk at hand as well as to the specificities of the relevant product, taking account of the impacts on the companies placing it on the market, including SMEs. This product-specific approach allows for targeted and specific due diligence obligations in so far as they relate to the product covered. This ensures a minimum level of effort on the part of all companies placing on the market a particular product, where that product is linked to specific social or human rights risks.

SPI due diligence would be formulated in a way as to ensure that companies are able to integrate compliance with SPI due diligence obligations into their overall due diligence system in case they have one.

Due diligence under the SPI in terms of compliance and enforcement could:

- require the involvement of independent third parties in the pre-market conformity assessment procedure, leading to third party verification of whether a company's due diligence system meets the SPI due diligence requirements (possibly involving audits and continued periodic surveillance). Relevant economic operators would be required to have available documentation demonstrating compliance with the due diligence obligations, including the results of the third-party verification; and
- In addition, allow, in specific circumstances, for the prohibition or restriction of products placed on the market by economic operators not complying with their due diligence obligation set through SPI by national market surveillance authorities.

Annex 14.1 sets out in more detail the differences and coherence between this measure and the SCGI.

Sub-option 3c: Bans on some products

This sub-option would be cumulative with sub-options 3a and 3b. It would include the possibility to prohibit some products or materials in specific products. This would build on a possibility latent in the current Ecodesign Directive²⁸, and would explicitly allow for such a possibility, in cases where a set of clear criteria are met. This is in essence what was done, among other measures, in the Single-Use Plastics (SUP) Directive.

This measure would go one step further by explicitly allowing for such a possibility where the assessment shows the following:

- important negative impacts on sustainability of specific products (e.g. single use items);

²⁸ Among the possible specific requirements mentioned in Annex II to the Ecodesign Directive, there is the possibility to limit the quantities of a given substance/material incorporated in the product, which would in principle allow to ban some substance/materials in specific products where the technical, environmental and economic assessment shows the need, feasibility and cost-effectiveness of such measure.

- the existence of alternatives fulfilling the same function (for example another product, including possibly a service) in a more sustainable manner;
- the feasibility and cost-effectiveness of a ban.

Option 4: Sustainability information for consumers and B2B

| Sub-problems | Specific objective |
|--|--|
| 1) Product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects 2) Too difficult for economic operators and consumers to make sustainable choices in relation to products | SO2: Better access to sustainability information along the supply chain |

Providing more transparent and reliable information to economic operators and consumers, on sustainability aspects of the products they can purchase should lead them to make more sustainable choices and, ultimately, drive businesses in the direction of sustainability. The information provided could support sustainable choices by consumers or by economic operators along the supply chain and enable value retaining operations such as: (preventive or predictive) maintenance, repair, re-manufacturing / re-furbishing / upgrade, recycling. This information could also facilitate the work of authorities in charge of market surveillance or customs and increase the effectiveness of the measures proposed under Option 7.

This information may be of different types:

- Information related to sustainability, potentially supporting or complementing requirements developed under Option 3 (for example on environmental impacts, circularity aspects, social aspects or on the tracing of chemicals of concern);
- Information taking the form of a scale of performance levels, with categories of performance enabling to easily compare an individual product with other similar products on the basis of their sustainability performance, and not only on the basis of technical performance and price;

Three sub-options on sustainability information for consumers and economic operators are considered in this impact assessment. The sub-options are cumulative: measures considered in sub-option 4a are also part of sub-options 4b and 4c. Sub-option 4c builds on sub-option 4b by complementing measure 4b.1.

Sub-option 4a: Enhanced information requirements

Sub-option 4a creates an obligation through secondary legislation for manufacturers to disclose and make available the information necessary for consumers and economic operators along the supply chain to make informed choices about the environmental and social impacts of the purchases or procurement and further management of products.

Measure 4a.1 – Information requirement on the durability or reliability of the product or its components

This measure requires from manufactures to provide information on the durability (technical lifetime) or reliability (mean time between failures) of the product or its components. It can accompany a

minimum requirement set in measure 3a.1, which provides for minimum requirements on the same aspects. It can also set an information requirement of its own, where this information would be likely to have a significant effect in driving the market towards more durable and reliable products, without eliminating the less durable or reliable products from the market. For example, this would be useful if these less durable products fulfil specific needs or if the switch to more durable products is likely to be too costly for some consumers. This information could take the form of a durability index, with classes of durability or reliability, where appropriate.

This measure will be implemented in synergy with the option on ‘commercial guarantee’ (guaranteed durability) in the Impact Assessment of the “Empowering consumers for the green transition” initiative. The option is described as follows:

Inform consumers at the point of sale of the existence or absence of a producer’s commercial guarantee for durability – and of its length - for the entire good and for a duration of at least 2 years.

Measure 4a.2 – Information requirements on reparability and upgradability, including a reparability scoring

This measure works identically to measure 4a.1 in relation to reparability and upgradability, including the availability of spare parts, availability of instructions/software for maintenance / repair operations, delivery time. It can accompany a minimum requirement set in measure 3a.2, which provides for minimum requirements on the same aspects. It includes the possible introduction of a reparability score, building on the scoring system for repair and upgrade of products developed by the European Commission’s Joint Research Centre²⁹. A similar scoring has been introduced in France with the French reparability index³⁰. Preliminary feedback in media articles indicate that progress in the implementation of the French index has already induced behavioural change of economic operators in terms of access to information for self-repairs, with mobile phone producer Samsung being the first manufacturer to publish an online manual for the repair of a proprietary mobile phone model.³¹

This measure will be implemented in synergy with the option on ‘repair information’ in the Impact Assessment of the “Empowering consumers for the green transition” initiative. The option is described as follows:

Provide consumers, at the point of sale, with a repair scoring index, showing how repairable a product is (for example, with 3 to 5 classes), whenever this is available, or required for that product in accordance with EU or national applicable laws. When no such repair scoring index is required or available, provide consumers at the point of sale with other relevant repair information when made available by the manufacturer, such as information about the availability of spare parts, including a procedure for ordering them, information about the availability of repair services, or the availability of a repair manual.

In relation to software updates or upgradability, this measure will be implemented in synergy with the option on software updates in the Impact Assessment of the “Empowering consumers for the green transition” initiative. This option is described as follows:

Inform consumers at the point of sale about the existence or absence of a minimum period of time (in number of years) during which the producer commits to provide free software updates, including security updates, for goods with digital elements as well as digital content and digital services to keep them in conformity, if this period is longer than the period of the producer’s commercial guarantee.

²⁹ JRC (2019). Analysis and development of a scoring system for repair and upgrade of products. JRC Technical Report. Seville.

³⁰ The Repairability Index regulation came into force in France on January 1, 2021. It aims to achieve a 60 % repair rate of electrical and electronic products within 5 years. See <https://www.economie.gouv.fr/particuliers/tout-savoir-indice-reparabilite>

³¹ https://www.lemonde.fr/pixels/article/2021/02/01/droit-a-la-reparation-des-appareils-electroniques-premiers-succes-pour-l-indice-de-reparabilite_6068400_4408996.html and <https://www.samsung.com/fr/support/repair-guides-spares-parts/>

Measure 4a.3 – Informing on the presence of substances of concern and tracing them

As flagged in the Chemicals Strategy for Sustainability, substances of concern³² should be minimised in products. Where they cannot be avoided, they should be traced to ensure that the products can be handled safely during use, efficiently treated in the waste management phase and, when relevant, that those substances are not perpetuated in material cycles, including in new products produced from recycled materials.

To achieve this, this measure would ensure the tracing of such substances through an information requirement. The main legal consequence (and driver for the avoidance of substances of concern) would be the obligation for manufacturers to ensure traceability of their presence in the product and its main components, throughout the lifecycle of the product.

This measure would aim to ensure that:

- Any economic actor in the value chain, including consumers, is able to receive sufficient information, at the time of purchase, on the substances of concern present in a product at concentrations exceeding a level depending on the product and the substance, including, as a minimum:
 - o the name of the substances,
 - o their location within the product,
 - o the safe use instructions of the product if applicable,
 - o and, at least for those substances identified as substances of very high concern under REACH, their concentration levels, at the level of the product as placed on the market, its components and spare parts.
- Waste operators receive information on the relevant product and material categories, when these are not confidential, as well as chemical information relevant for safe disassembly, where appropriate.

Tracing requirements would be set at two levels by:

- Laying down substances harmful to human health or the environment to be tracked for all or for groups of products (starting with those substances for which information requirements exist already today - substances identified as Substances of Very High Concern (SVHC) under REACH - to be gradually increased to substances of concern) - possibly via SPI measures, if 3b.1 enabling the adoption of SPI measures for groups of products is retained.
- Specifying other substances of concern, including those that are not necessarily hazardous, but affecting the broader sustainability of the product, namely recycling, reuse, remanufacturing, to be tracked in product-specific measures.

For the products to which it applies, this measure would aim to overcome the limitations of existing requirements on the tracing of substances in products (in REACH and the Waste Framework Directive³³) by better defining the reporting level and the data to be provided and by enabling the extension of tracing to a larger group of substances. The manner in which information is made

³² These include, as described in the recently adopted *Chemicals Strategy for Sustainability*, substances having a chronic effect for human health or the environment (Candidate list in REACH and Annex VI to the CLP Regulation) but also those which hamper recycling for safe and high quality secondary raw materials.

³³ For detailed articulation with these existing requirements, see *Annex 14*.

available should be adapted to the product and how it is used.³⁴ Where relevant the resulting information would also be integrated in a digital product passport as provided in Measure 4b.1.

Tracing requirements can either accompany restrictions set by means of existing chemicals legislation on the basis of chemical safety or through measure 3a.3, which provides the possibility to restrict the presence of substances hindering circularity, or be set on their own. Restriction and, in case substances of concern cannot be avoided, tracing requirements set under SPI would both contribute to the minimisation of substances of concern in products.

Measure 4a.4 – Information requirements on recycled content on the product or its components

This measure requires manufactures to provide information on recycled content on the product or its components, for example plastic parts. It can accompany a minimum requirement set in measure 3a.4, which provides for minimum requirements on the same aspects. It can also set an information requirement of its own, where setting a minimum requirement is not feasible or not appropriate, for example where quality specifications vary a lot between products or where the capacity of recycling processes to provide the quality needed in acceptable economic conditions is not certain.

Measure 4a.5 – Information requirements on the environmental impacts along the life-cycle of the product, for example in the form of an Ecological profile

This measure requires manufactures to provide information on the environmental impacts along the life-cycle of the product. It can accompany a minimum requirement set in measure 3a.5, which provides minimum requirements to reduce carbon and environmental footprints through minimum requirements set at process and/or life cycle environmental impact(s) level.

This information could take the form of a product's ecological profile, as provided in Annex I Part 3 of the Ecodesign Directive. The Directive defines such a profile as *'a description, in accordance with the implementing measure applicable to the product, of the inputs and outputs (such as materials, emissions and waste) associated with a product throughout its life cycle which are significant from the point of view of its environmental impact and are expressed in physical quantities that can be measured.'* Even if it has never been implemented so far, the use of the Product Environmental Footprint method could facilitate its definition and implementation.

In the case where specific technical parameters are used, the SPI measure setting the requirement should include the measurement and calculation method and the level required. Tests and measurement methods may be further detailed in harmonised standards, developed by European standardisation organisations on request of the European Commission following the 'New Legislative' approach. The SPI framework act will not pre-determine the choice of the methodology or tool to assess the environmental impacts over the life cycle of a product: this will be decided depending on the product and the typology of requirements to be included, and will be reflected in the SPI measure setting those requirements. In the case where the Product Environmental Footprint method will be used, manufacturers could be required to perform a PEF study for each product model to prove compliance with the requirement, for example using IT-tools that would be made available by the European Commission (similar to the one currently under development for PV modules). If this option is chosen, the study would follow the rules and calculation methods set in Product Environmental Footprint Category Rules, developed following the dedicated Commission Recommendation.

³⁴ See final report of the recent study on 'Information flows on substances of concern in products from supply chains to waste operators' (DOI:10.2873/289169, 2020, COM).

For articulation with the Green Claims Initiative, see *Annex 14*.

Measure 4a.6 – Information requirements in the form of sustainability performance classes

This measure builds on the information requirements as defined in Measure 4a.5 and includes the definition of life cycle environmental performance levels, with categories of performance enabling to easily compare an individual product with other similar products on the basis of their life cycle environmental performance, and not only on the basis of technical performance and price. This could take the form of a label on the product or as part of the information provided to consumers. This can be a powerful driver to move the market towards more sustainable products. This is in essence the rationale of the Energy Labelling for energy efficiency on the use phase and other environmental and performance characteristics.

This approach could be used when the repartition of the performance of products on the market makes such performance classes technically possible and relevant. Relevant parameters would represent hotspots in the product life cycle, i.e. major environmental impacts in specific or all phases of the life cycle. The environmental impact categories of the Product Environmental Footprint method (individually or combined through normalisation and weighting giving a single score) could be used to provide parameters covering the whole life cycle of products.

In the case where specific technical parameters are used, the SPI measure setting the requirement should include the measurement and calculation method and the level required. Tests and measurement methods may be further detailed in harmonised standards, developed by European standardisation organisations on request of the European Commission following the ‘New Legislative’ approach. The SPI framework act will not pre-determine the choice of the methodology or tool to assess the environmental impacts over the life cycle of a product: this will be decided depending on the product and the typology of requirements to be included, and will be reflected in the SPI measure setting those requirements. In the case where the European Commission Product Environmental Footprint method will be used, manufacturers could be required to perform a PEF study for each product model to prove compliance with the requirement, using IT-tools that would be made available by the European Commission (similar to the one currently under development for PV modules). If this option is chosen, the study would follow the rules and calculation methods set in Product Environmental Footprint Category Rules, developed following the dedicated European Commission Recommendation.

In addition, environmental performance levels, once established, can be used in the definition of purchasing criteria by public authorities or private companies purchasing departments, and is the basis for incentives schemes mentioned in several measures under Option 5.

For articulation with the Green Claims Initiative, see *Annex 14*.

Measure 4a.7 – Information requirements on a set of social indicators

This measure would build on an assessment of social aspects in the value chain of products, with a view to identify hotspots, i.e. to identify which value-chain actors may have significant positive or negative social impacts. This identification should help identifying the most suitable indicators to be used among a basket of indicators listed in the legislation.

From a policy making perspective the hotspot identification and selection of the indicators could either take place at central level, per sector (increasing the comparability of information) or it could be left at the level of each company (increasing the materiality of the information).

The set of social indicators (or if decided at the level of each company, the method to be followed for establishing the indicators) would be established through SPI measures, including compliance with ILO fundamental conventions. The reporting format and calculation method where relevant, would be

set in the same acts and could provide the inclusion of the reporting on indicators in the European Digital Product Passport provided in Measure 4b.1.

Sub-option 4b: European Digital Product Passport

Sub-option 4b includes the measures of sub-option 4a and develops their ambition by requiring that the information requirements placed on products be displayed in the form of a European Digital Product Passport and include social information and other indicators. Information requirements are added to support the implementation of requirements placed on products as per sub-option 3b. The EU DPP requirements would be set out through the SPI measures, which would also determine the products in scope (see Annex 18 for more details).

Measure 4b.1 – Information requirements in the form of a European Digital Product Passport through SPI measures

Digital technologies provide the possibility to tag, track, trace, localise, and share product related data, down to the level of the individual components and materials. The EU DPP is a structured collection of product related data with predefined scope and agreed data ownership and access rights. Therefore, EU DPP is a combination of unique product identification and data collected by different value chain actors linked to a unique identifier.

The data to be collected and conditions of access would be defined in product-specific SPI measures and could include track & tracing information (e.g. the name of the manufacturer, the geographical origin of the different components, the global trade item number, the name of the authorised representative, etc.), and attributes such as its composition, as well as the information referred to under sub-option 4a above. While the EU DPP data could be unique for each individual product or set at batch/model level, the EU DPP structure would be common for a given product category.

The information made available through the EU DPP should enable consumers and other economic actors to make better-informed decisions on the basis of clear, reliable data³⁵. It will boost the visibility and credibility of sustainable businesses and products. The EU DPP will build on existing data and related initiatives³⁶, linking possibly to existing databases such as the EPREL database. It will be based on a decentralised³⁷ system, allowing most of the data to remain where they are produced. It may facilitate customs and market surveillance authorities to better carry out their duties on the basis of standardised information, in some cases already verified through independent third-parties.

³⁵ While preserving confidentiality when required, the data collection of the passport, especially if mandatory, would allow to build anonymised datasets of a number of product impact indicators. Such anonymised datasets are key to enable a transparent technical discussion with Member States and Stakeholders to define environmental (Ecodesign/SPI) criteria. The European Commission hosts for decades several of such very technical consensus-aiming processes to coin secondary legislation, one example being the ‘Sevilla Process’ that develops mandatory emission limit values and Best available Technique Documents (BREFS) under the Industrial Emissions Directive. https://en.wikipedia.org/wiki/Best_available_technology

³⁶ Synergies will be sought where possible with other emerging initiatives, such as the initiative related to the digital labelling of mandatory product information of chemicals and the ‘empowering consumers for the green transition’ on circularity information.

³⁷ While the proposed system is mostly decentralised, some elements, e.g. the standard setting, will remain centralised.

Measure 4b.2 – Integrating the SCIP Database (implementing Article 9 (1) (i) of the Waste Framework Directive) with SPI requirements

Communication of information on the presence of substances of concern throughout the supply chain and to waste operators (as described in Measure 4a.3) is a challenge. A recent study performed for the European Commission concludes that part of the solution should be digital.³⁸ Whereas measure 4a.3 provides for information requirements on the presence of substances of concern and their traceability, this measure would go a step further by including that information in the DPP provided in measure 4b.1. As such, the DPP could, where available, take on the digital aspects of the communication requirements provided in Measure 4a.3.

The development of product passports in the context of the SPI also provides an opportunity to further overcome some of the limitations of existing communication obligations related to substances of concern, particularly Article 33 REACH and Article 9 of the Waste Framework Directive.³⁹ By including information on substances of concern in the DPP it can, in addition to better defining what needs to be communicated as referred to under measure 4a.3, be more effectively communicated throughout the life-cycle and be better tailored to the product(s) to which it applies. Where the EU DPP effectively covers the communication on chemical substances of concern, the progressive transfer of communication obligations under the Waste Framework Directive and REACH to the SPI should be considered. This could eliminate the unnecessary administrative burden of having to provide the same information more than once.

This should also lead to integration with the existing database of information on “Substances of Concern in articles as such or in complex objects (Products)” (SCIP). Currently, the SCIP database contains information required by REACH on the presence of substances of very high concern in ‘articles’ (also including product components), which suppliers are required to notify to the European Chemicals Agency (see Article 9 of the Waste Framework Directive). Without integration, the introduction of communication obligations on the same (and possibly more) substances via the European Digital Product Passport would risk to create a third obligation to communicate (partly) the same information (under REACH, under the Waste Framework Directive and under the SPI).

Integration with the SCIP database could be realised in different manners. In this regard, the digital part of the proposed obligations to communicate information on the presence of substances of concern in products, could follow **three different paths**:

- Be notified only once to a designated organisation or agency (e.g. European Chemicals Agency, ECHA) that would provide centralised storage and management of the information (e.g. an updated version of the SCIP database). That organisation would provide a reference number/link for the submission that should accompany the product (as part of the EU DPP) and allow information retrieval by other actors;
- Remain under the responsibility of the actors in the supply chain, who should make it available (as part of the EU DPP) to consumers, authorities and waste operators in accordance with the relevant provisions in the relevant SPI measure, based on a decentralised storage approach;
- Give autonomy to companies to decide whether to notify, on a voluntary basis, to the designated organisation, which would store the information, or to make the information available (as part of the EU DPP) to consumers themselves. Whichever their decision, the

³⁸ See the final report of the recent study on ‘Information flows on substances of concern in products from supply chains to waste operators’ (DOI:10.2873/289169, 2020, COM).

³⁹ See for details on these limitations on the ‘Tracing of chemicals in products’ in Annex 14.

physical tagging of the product would still be under the responsibility of the actor placing the product on the market. The centralised database (e.g. an updated version of the SCIP database) could act as technical support for SMEs, while allowing for integrated value chains to provide the information autonomously. The centralised database could also act as a host to the information on products produced by companies that ceased to exist.

Sub-option 4c: Generalised European Digital Product Passport

While measure 4b.1 on the EU DPP is implemented through SPI measures defining horizontal aspects of the product passport, and detailing the specific features and content associated with groups of products, this sub-option goes one step further by introducing directly in the legislative proposal (revised Ecodesign Directive or separate legislative proposal) some “cross-sectoral” requirements and all the necessary information in terms of product scope, governance, obligation of stakeholders, content and technical features so that the product passport becomes directly applicable to all products in scope. The legislation could provide for a differentiated schedule of implementation, to take account of the various levels of complexity of this implementation on different products. Such direct application could still provide the possibility for SPI measures, should further detailed requirements be necessary for specific product groups or to supplement the common features of the EU DPP provided in the legislation.

Option 5: Reward more sustainable products through incentives

| Sub-problem | Specific objective |
|---|--|
| 1) Product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects | SO3: Incentivise more sustainable products and business models to improve value retention |

The use of economic and reputational incentives can be used to break away with linear patterns of sustainable consumption and production,⁴⁰ to incorporate environmental and social sustainability and circularity considerations in product design,⁴¹ and to modify the behaviour of economic operators and citizens to make sustainable choices.

The evidence provided in *section 2 Problem definition* above demonstrates that more sustainable decisions in relation to products are not always the first choice for European market operators and citizens due to market, regulatory and behavioural failures.⁴² The use of economic and reputational incentives can be used to modify these choices and break away with linear patterns of sustainable consumption and production. For some measures, pilot projects can be used to demonstrate the business case and public good rationale of choosing sustainable products, ultimately raising the level of ambition of Member States in setting up harmonised incentives-based product policies across the Union.

Three sub-options to reward more sustainable products through incentives are considered in the impact assessment. They build on the information requirements and classes of performance developed under Option 4. The three sub-options are cumulative, with an increasing number of measures (except

⁴⁰ See for example Ecorys (2010), Tukker, Diaz Lopez, et al (2011), BIO Intelligence service et al (2012), OECD (2016), UN Environment (2020).

⁴¹ See for example European Commission (2019), UN Environment (2018).

⁴² **Error! Reference source not found..**

for measure 5b.1, which is alternative to 5a.1), which correspond to an increasing level of ambition as well as complexity. Sub-option 5a and 5b rely on measures (e.g. Member States incentives on green products, Green Public Procurement, Extended Producer Responsibility schemes) which correspond to already-existing EU instruments. In addition to them, sub-option 5c proposes a set of innovative instruments, which have not been implemented so far. All incentives considered under Option 5 need to be implemented in a way to avoid discrimination between the EU and imported goods and to be in compliance with State aid rules, where applicable.

Sub-option 5a: Enhanced incentives measures

This sub-option focuses on enhancing existing reputational and economic incentives, encouraging Member States to reward products based on their sustainability performance.

Measure 5a.1 Member States encouraged to introduce reputational and economic incentives and supported by the provision of guidelines

Member States have been implementing a number of economic incentives to encourage the uptake sustainable products with different degrees of success (see baseline for Option 5 in **Annex 10: Impacts of the policy options**). To facilitate effective introduction of incentives at the national level, the European Commission will **provide guidelines** to support public authorities in Member States with the introduction of reputational and economic incentives. The European Commission will pay particular attention to incentives that reward products based on their sustainability performance, making use of the classes of performance developed under sub-option 4a⁴³. Depending on the product group, incentives may include pricing mechanisms (including differentiated VAT, eco-vouchers and green taxation) and GPP.

Where appropriate product specific guidelines will also be provided concerning the modulation of financial contributions in the context of Extended Producer Responsibility (EPR), in addition to those already provided in accordance with Article 8 of the Waste Framework Directive. The envisaged outcome of the incentives is to contribute to the strengthening of markets and to increase consumer preference for sustainable products. It is also expected that incentives can contribute to bringing their costs down, making them more affordable.⁴⁴ The incentives may also contribute to generating trust in particular among earlier adopters of risky innovative products. The guidelines will be connected to the promotion of voluntary standards, which can play an important role for the uptake of sustainable products and the adoption of sustainable business models, as they can specify minimum levels related to the durability of products and support in the adoption of management systems⁴⁵. Standards also have commercial benefits and can be used as marketing tools for economic operators⁴⁶. In addition to the provision of guidelines, this measure is to be supported by activities focusing on exchange of best practices and training between/for public authorities (e.g. increasing technical capacities and legal expertise of procurers), product-related harmonisation of measures (e.g. revised Ecodesign directive,

⁴³ The performance classes are described in Measure 4a.6.

⁴⁴ OECD (2016) *Creating market incentives for greener products*. OECD Publishing, Paris.

⁴⁵ Through this measure, the European Commission can develop guidelines to encourage Member States to promote the wider adoption of circularity voluntary standards among economic operators in those product groups within the scope of the revised Ecodesign Directive (in particular the ISO-59000 series for circular economy and EN-45550 series for material efficiency aspects of eco-design). This is a complementary measure to the existing provisions included in the European Standardisation regulation (2012/1025/EU) and the Annual Union Work Programme on Standardisation, in particular those activities related to the product groups in the revised Ecodesign Directive. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN>

⁴⁶ European Committee for Standardization, Benefits of standards, <https://www.cencenelec.eu/research/innovation/benefits/Pages/default.aspx>

EU Ecolabel and GPP), and support for the transposition to national law (e.g. eco-modulation of fees in EPR).⁴⁷

Measure 5a.2 Mandatory Green Public Procurement requirements in SPI product-specific rules

Public authorities are major consumers in Europe: public procurement represents around 14 % of the EU's gross domestic product. There are many potential benefits to harmonising green public procurement for products, harmonising criteria used by Member States ensures the functioning of the internal market, improves EU-wide competition, and reduces the administrative burden for economic operators and authorities. Secondly, a direct reduction of the environmental impacts related to public authorities' activities can be achieved. Thirdly, public authorities, as representatives of the collective interest, bear the costs of negative externalities (e.g. as health-care costs or remediation costs) of unsustainable practices and greening procurement offers them a chance to take an active role in the reduction of those externalities.

For SPI, another important benefit could be to bring about a shift in the market towards more sustainable products by creating and sustaining demand for better performing products in terms of the aspects addressed by SPI. A certain, stable and sustained demand of such better performing products provides incentives to the industry to innovate and can drive down the costs of existing sustainable products via economy of scale.

This measure therefore allows for the setting of requirements on public authorities to purchase more sustainable products. Similarly to what was proposed in the recent proposal for a Batteries Regulation⁴⁸, this measure would empower the European Commission to set mandatory criteria or targets for contracting authorities and contracting entities (as defined in the legislation on public procurements, i.e. Directives 2014/24/EU and 2014/25/EU) when purchasing products covered by the SPI measures. These criteria and targets should be defined at the level of specific products or well-defined product groups and be based on requirements set for the relevant products through SPI (e.g. based on classes of performance and/or information requirements under Option 4).

The development of clear and implementable targets and criteria requires taking into account information on market availability and economic efficiency, as well as information collected from stakeholders of industry, civil society and Member States. Defining criteria or targets at the level of specific products or well-defined product groups allows for the careful assessment of impacts based on this information. It would allow to take into account the added value and proportionality of creating procurement targets or criteria depending on the market situation of the relevant products.

Sub-option 5b: Linking incentives to performance

This sub-option includes Measure 5a.2 while Measure 5a.1 is replaced by Measure 5b.1, which makes mandatory for Member States the use of classes of performance (see sub-option 4a) when adopting incentives for sustainable products.

⁴⁷ SPI Task 4 report – based on inputs from stakeholders.

⁴⁸ Art. 70, COM(2020) 798 final

Measure 5b.1 Member States obliged to use classes of performance for reputational and economic incentives

This measure would require Member States - if they provide incentives for products covered by a SPI measure- to target those incentives at the highest performance classes, similarly to the approach taken in the Energy Labelling framework⁴⁹.

Linking incentives to performance class has several precedents, for example bonus/malus in France on automobiles where the vehicles are incentivised (or disincentivised) according to their emission class. Another related example is tax relaxation on company passenger vehicles (Taxe sur les véhicules des sociétés) for hybrid (first 2 years) and electric vehicles (zero tax).

Measure 5b.2 Modulation of EPR fees to performance classes

Through product specific implementing measures adopted in the context of the revised Ecodesign legislation, Member States are required to ensure that the fees paid by producers in the context of existing or new Extended Producer Responsibility (EPR) schemes are modulated according to the sustainability performance classes of the relevant product (as described in measure 4a.6).

At present, Member States are required to introduce EPR schemes for several waste streams: waste, electrical and electronic equipment (WEEE), batteries and end-of life vehicles. Member states are also required to ensure the establishment of EPR schemes for packaging by 31 December 2024. Several Member States have established EPR schemes for additional product categories, such as tyres, chemical products and textiles. The modulation of EPR fees is set out in Article 8a of the revised Waste Framework Directive 2008/98/EC which stipulates that in the case of collective fulfilment of EPR these fees:

“are modulated, where possible, for individual products or groups of similar products, notably by taking into account their durability, reparability, re-usability and recyclability and the presence of hazardous substances, thereby taking a life-cycle approach and aligned with the requirements set by relevant Union law, and where available, based on harmonised criteria in order to ensure a smooth functioning of the internal market”

Through modulation, the financial contribution paid by the producer (any natural or legal person who professionally develops, manufactures, processes, treats, sells or imports products) to comply with EPR obligations, will vary according to specific criteria relating to aspects of their sustainability. Products with a higher environmental performance will be charged at a lower rate than those with a lower environmental performance. Under this measure the modulation is harmonised by basing this on product performance classes.

Sub-option 5c: Consumption-oriented incentives

This sub-option is based on sub-option 5b plus the introduction of a set of innovative (and therefore more complex in their implementation) incentive measures.

Measure 5c.1 Bonus for EU citizens to reduce carbon footprint.

This option would be actionable only in case SPI will develop environmental requirements on the basis of an existing or on-purpose developed PEFCR⁵⁰. For each product in scope of the new SPI

⁴⁹ Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU, Article 7(2) *“Where Member States provide incentives for a product specified in a delegated act, those incentives shall aim at the highest two significantly populated classes of energy efficiency, or at higher classes as laid down in that delegated act”*

⁵⁰ Product Environmental Footprint Category Rules, see https://ec.europa.eu/environment/eusdd/smgp/PEFCR_OEFSR_en.htm

there will be available (through the corresponding PEF CR) the environmental profile of the representative product, meaning the average product placed on the EU market. The environmental profile provides a value for the environmental impact of the average product for each of the 16 PEF impact categories; it also allows, as an option, to have the value of the total weighted impact (single score).

Each product in scope of the new SPI will be assigned a carbon footprint score (calculated through PEF) and included in the European digital product passport (EU DPP). When the product is bought, the bill would indicate the carbon footprint value of the corresponding representative product (e.g. the carbon footprint of the average pair of jeans sold in Europe), the carbon footprint score of the specific product bought, and the difference between the carbon footprint of the average product and the specific one. At the end of each fiscal year, each family could calculate the amount of carbon “saved” through their consumption (compared to the carbon they would have consumed buying only “average products”). Member States would then be allowed to compensate each family proportionally to the amount of carbon saved (e.g. through eco-cheques or other financial incentives). This measure would promote the uptake of low carbon products, steer sustainability oriented consumption habits, and could help compensating families for their efforts in contributing to achieving societal-oriented objectives like carbon neutrality. The bonus would be a win-win solution. The manufacturer would have an incentive to place on the market products with lower carbon footprint, as this would lead to higher market uptake from the consumers. The consumers would be incentivised to buy products with lower carbon footprint, as they would receive a direct economic benefit through a tax rebate calculated as difference between the carbon footprint of the average product sold in the market and the carbon footprint of the specific product bought. This approach would also address the known “knowledge gap” for which people do not act if that does not translate into a direct economic saving for themselves. The implementation of the measure would require a calculation methodology, scoring system and tables with rates or equivalences between the tax return and the carbon savings.⁵¹

Measure 5c.2 Introduction of an excise proportional to the life cycle environmental performance of the products placed on the EU market.

The use of environmental taxes in European policy making is widespread (e.g., in the form of an excise on higher CO₂ emission fuels).⁵² At the EU level, the Energy Taxation Directive (Council Directive 2003/96/EC) defines the rate for the excise duty in place for energy products and electricity.⁵³ The “Energy Taxation directive” provides a minimum EU threshold and Member States define the level of ambition thereof. Member States can apply higher rates for certain usage of the products (petrol, gas oil, kerosene, heavy fuel oil, liquefied petroleum gas, natural gas, coal and coke, electricity and mineral oil). It also establishes reduced rates and exceptions for green electricity, biofuels and other energy efficient usages.⁵⁴

This measure in a way similar to 5.b.1 which covers a wide range of incentives, but tackles the issue in a more horizontal manner through an excise duty. The excise duty, linked to the relevant performance class, would be levied on the products placed on the EU market, irrespective of where they are produced.

The introduction of an EU-level excise proportional to the environmental performance of products would need to be first implemented at the pilot level for few strategic products within the scope of the

⁵¹ BIO Intelligence Service et al (2013). *Modelling of Milestones for Achieving Resource Efficiency*. Project for the European Commission, DG Environment. Paris.

⁵² See also: Barhold (1994) Issues in the design of environmental excise taxes. *Journal of economic perspectives*. 8 (1) pp. 133-151

⁵³ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32003L0096>

⁵⁴ https://ec.europa.eu/taxation_customs/sites/default/files/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

revised Ecodesign directive, and considering available evidence on the environmental performance of said products (e.g., LCA studies, PEF, etc.). The implementation of the measure would require a calculation methodology, guidance documents and tables with the different rates for the products within scope of the excise duty, the life cycle addressed, and across the different Member States.

Option 6: Measures for circular economy and value retention

| Sub-problem | Specific objective |
|--|--|
| 1) Product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects 2) Too difficult for economic operators and consumers to make sustainable choices in relation to products | SO3: Incentivise more sustainable products and business models to improve value retention |

Value retention and value maximization aims at capturing value that is lost through unoptimized systems or practices. This can mean that both economic and environmental value is wasted when products are not used to their maximal capacity.

For example, it happens that producers, importers or retailers destroy unsold goods through landfilling or incineration, due to various reasons, whether economic or logistical (e.g. warehousing) or marketing (e.g. launch of a new product, good scarcity, brand exclusivity). These goods are often still fully suitable for use.

It can be challenging for businesses, particularly SMEs, to launch circular and value retention activities in markets and value chains that are linear, policies are therefore needed to provide a conducive and supportive framework.

Circular business models (CBM) include (1) **value retention actions**, such as for example maintenance, repair, re-furbishing, re-manufacturing, component harvesting, upgrading and reverse logistics, (2) **value maximisation actions**, such as for example products-as-a-service,

Sub-option 6a: Promotion of value retention and value maximisation

This sub-option supports economic operators and citizens to make sustainable choices in relation to products, and incentivise development of markets for circular business models.

Measure 6a.1. Provide guidelines on supporting circular business models

To foster the change of paradigm towards the implementation of circular economy, a comprehensive knowledge on designing circular business models (CBM) is necessary. There is limited transferability of existing circular business models, and no exhaustive framework supporting both companies and policy-makers to design CBMs.

This measure focuses on the **provision of guidelines** for encouraging public authorities and economic operators in Member States to foster the uptake of CBM: such as for instance (but not limited to) product-as-a-service, maintenance, repair, re-furbishing, re-manufacturing, reverse logistics, upgrading, and collaborative and/or sharing economy. The guidelines are intended to provide support to public authorities and economic operators in addressing barriers and drivers analysed in Annex 7: Problem Definition. Through this measure, specific guidelines present existing EU-level instruments and share best practices from Member States-level programmes supporting CBMs, such as financial and technical support, reduced VAT rates for repair services, material brokerage services, public

procurement, identification of circular opportunities and target setting. The guidelines will cover direct or indirect financial support, e.g. access to information about available funding supporting economic operators interested in developing sustainable product initiatives, or direct access to public, private or blended financing, (e.g. lending and grants).⁵⁵ Covering both the improvement of current business models and the development of new ones, they will also assist stakeholders in defining the operation of CBMs and its various components, such as value proposition, customer segments, channels, costs and revenue streams, activities, partnerships, etc. The change of paradigm to a circular economy will require to address different kind of stakeholders, as both companies with significant market shares and emerging companies have a role to play.

The Guidelines can be used in combination with venture capital funding of the EIC fund in projects eligible for the EIC accelerator supporting certain types of CBMs, the support of specific CBMs used by SMEs in the EU Taxonomy (in particular for the objective of transition to a circular economy), guidance about the use of the Transformation Capital Initiative of Climate KIC⁵⁶, etc.

Measure 6a.2. EU-wide hub supporting the uptake of circular business models

This measure sets up an EU-wide hub supporting the uptake of circular business models, channelling information and services including awareness raising, cooperation, provision of training, exchange of best practices, etc.⁵⁷ Through case-studies and lessons-learned sharing, the hub will support the geographical expansion of CBM across Europe, with a specific attention paid to avoid lock-in effects and hence ensure sustainability of the highlighted models. It responds to the need to address the market failure of imperfect information (CBM are not known or properly understood)⁵⁸ and that markets for circular business models are insufficiently developed. In its implementation, it will be closely linked to the European Circular Economy Stakeholder Platform (ECESP). The EU CBMs hub can follow the model of a one-stop shop that gathers existing information and services hosted / managed by other programmes and agencies at the EU and MS level. Such hub can be built on the “no wrong door” model and/or could be part of the services of the Enterprise Europe Network. The hub can be subsequently linked to the existing infrastructure, communication channels and community of practice/ network of initiatives such as the Circular Economy Stakeholder Platform, and the CircLean Network of businesses and SMEs for Industrial Symbiosis. Following the model of knowledge exchange implemented by the Canadian Clean Growth Hub for the support of cleantech,⁵⁹ existing measures would be presented across the environmental life cycle of a product (design phase, manufacturing, use phase, end of life). It would also highlight the type of horizontal support measure, for instance:

- Guidance: technical, administrative and policy guidance documents (from different product policies, e.g., EMAS, GPP)
- CBMs label and self-assessment tool to identify and design CBMs
- Training and capacity building (European Institute of Innovation & Technology, EIT, KIC’s training on sustainable business models; reparability training for specific product groups, etc.)

⁵⁵ Impact Assessment, Sub-problem 1

⁵⁶ <https://www.climate-kic.org/programmes/transformation-capital/>

⁵⁷ For further references, see also: SITRA, 2020 Rethinking ownership (sitra.fi)

⁵⁸ See also in *Error! Reference source not found.*, section *Error! Reference source not found.*

⁵⁹ <https://www.ic.gc.ca/eic/site/099.nsf/eng/home>

- Direct assistance in resource efficiency assessment, Intellectual Property Rights - IPR, certification, incubation, knowledge valorisation, and innovation services (EEN relay services, European Resource Efficiency Knowledge Centre - EREK, IPR helpdesk)
- Incubator and accelerator programmes
- Financial support (European Investment Bank, EIB, circular economy financing facility and investment criteria)
- Network and ecosystem building (EIT KICs incubation and acceleration services)
- Awards (European Business Awards for the Environment EBAE, Dutch Circular awards, Economy Startup Europe Award - Circular Economy Category 2018)

Sub-option 6b: Enhanced value retention and value maximisation

This option includes all measures included in option 6a, and goes further by introducing a transparency obligation and a ban on the destruction of unsold consumer products via SPI measures in the context of the revision of the Ecodesign directive.

Measure 6b Introduce a transparency obligation and a ban on the destruction of unsold consumer products via SPI measures

This measure first introduces a transparency obligation, requiring economic operators to disclose information on the number of unsold products destroyed, the reasons for their destruction and their subsequent treatment. Its purpose is to dis-incentivize destruction, while it can also facilitate monitoring the extent to which destruction of unsold products takes place in practice. This obligation also applies in case products were destroyed under applicable exemptions to a prohibition on destruction of unsold products, which would be introduced via SPI measures. In this case it serves as a dis-incentive for circumvention and as a tool for verification purposes. A transparency obligation is a relatively ‘light’ measure compared to a requirement to report to competent authorities, and would be in line with the approach under the Non-Financial Reporting Directive which requires all large companies and all companies listed on regulated markets (except listed micro-enterprises) to disclose information on the way they operate and manage social and environmental challenges. This transparency requirement gives companies flexibility on how to disclose relevant information following international, European or national guidelines according to their own characteristics or business environment.

The main implementation principle of the ban on the destruction of unsold consumer products is to prohibit the destruction of unsold consumer products via SPI measures for specific products or a group of products under the SPI scope. Instead of discarding unsold products these would remain available for sale, donation or possibly upgrading and remanufacturing. Destruction of unsold products can be considered the discarding or intentional damaging of these products after which they enter into the waste stage. Recycling of this waste would still be considered destruction, given the need to e.g. shred or take apart the products for this purpose. In principal the measure does not distinguish between unsold and returned products, which after their return remain unsold products.

A ban on the destruction of unsold products would incentivise stakeholders to improve product stock management across the value chain in order to prevent surpluses and in order to minimise the volume of unsold products. It would also make alternatives for destruction more attractive, notably sale (possibly at a reduced price) and donation.

The product scope of a ban on the destruction of unsold products is determined through SPI measures, based on an assessment of the extent to which destruction of unsold products occurs in different product categories and for which categories this measure would be proportionate. To this end, the Commission will collect and make use of information disclosed by economic operators under the transparency obligation on the destruction of unsold consumer products. Under this obligation economic operators are required to publicly disclose the number of unsold consumer products destroyed per year differentiated per type or category of products; the reasons for their destruction; and their subsequent treatment.

Based on this information the Commission will determine for which groups of unsold products a prohibition on their destruction should be considered. Taking into account the reported reasons for destruction the Commission will define exemptions to a prohibition on destruction to ensure proportionality of the prohibition. Exemptions may for instance include the destruction of unsold products: in view of health and safety concerns; in view of damage to such products; with a view to the remanufacturing of such products; in case the product has been refused for donation, or; by small and medium-sized enterprises.

While the measure prohibits the discarding of unsold goods, it does not stipulate what holders may or should do with these products instead. The measure applies to importers, traders and distributors of products covered by the SPI measure(s). Where exemptions apply discarded products should be treated in an environmentally sound manner, taking into account the waste hierarchy.

The SPI measure that introduces the ban on destruction of unsold products may exclude targeted economic operators, for instance by focusing on large companies and all companies listed on regulated markets (except listed micro-enterprises) holding unsold products in the EU covered by the SPI measure. This could be considered in order to ensure proportionality of the measure. The transparency obligation does not apply to SMEs. It is expected that this instrument is more effective as a disincentive when applied to large enterprises. SMEs seem to only cover a limited market share. In e-commerce of consumer goods this is an estimated 12.76%⁶⁰.

Circumvention, possibly by exporting unsold products for destruction in third countries, may be addressed by applicable waste legislation. If products are exported to be destroyed this should be considered as an international shipment of waste. Shipments of waste from the Community to third countries (except EFTA countries) for disposal are prohibited under the Waste Shipment Regulation (WSR). Transport for recovery should, depending on the type of waste and destination, at least be compliant with general WSR information requirements and could be stopped in apparent cases of destruction of unsold products covered by applicable SPI measures. Transparency obligations provide a further dis-incentive for circumvention.

Option 7: Strengthened application of the Ecodesign framework

| Sub-problem | Specific objective |
|---|---|
| 3) Sub-optimal application of the current Ecodesign legislation | SO4: Improve application of sustainable product legislative framework |

The Ecodesign framework has proven to be an efficient framework to regulate energy related products. However, some weaknesses have been identified, both during the definition of the implementing regulations and their enforcement. Potential remedies to these weaknesses have been

⁶⁰ As estimated based on Euromonitor data for e-commerce for 2021.

identified by evaluations⁶¹, reports⁶² and positions from various stakeholders including the European Parliament⁶³.

Three sub-options are identified, progressively extending the number of actors directly involved. Thus, the first sub-option (7a) focuses on improving the processes leading to the adoption of measures, sub-option (7b) focuses on better enforcement, with measures that focus on market surveillance, and sub-option (7c) proposes a model under which the European Commission is provided with executive capacities, to prepare measures and to support and complement Member States in fulfilling their role.

Sub-option 7a: Improve the current framework to increase efficiency

Measure 7a.1 Streamline the procedures for the development and adoption of Ecodesign implementing regulations

The process for adopting implementing measures under Ecodesign is subject to procedural and methodological requirements. In recent years, the Better Regulation steps were added to this already quite extensive process. The process currently followed for adopting Ecodesign measures is thus more lengthy and complicated than for the adoption by the European Commission of an ordinary legislative proposal, despite the typically rather narrow, product-specific scope. Over a time span of about 4 years, each review of the implementing measures (Ecodesign, often coupled to Energy labelling) for a product group entails detailed preparatory or review studies, expert stakeholder meetings, consultation forum meetings, roadmaps, impact assessments, open public consultation, feedback mechanism and Member States' committee vote in the final stages of adoption. This measure aims to streamline this process and make it more efficient by acting on its different steps.

Firstly, the combination of preparatory/review studies and impact assessment studies is proposed since there are many common aspects in the 2 processes. Consequently, the call for evidence, the consultation of stakeholders through the Consultation Forum and internal European Commission consultations could run partially in parallel allowing inputs to be used in a more dynamic manner. The underlying methodology (currently the MEERP) would continue to provide the structure for the studies (together with the Better Regulation impact assessment guidelines), but the integration of circularity aspects and clear timelines would have to be introduced. A new digital and more interactive platform (i.e. integrating functions of online fora) could facilitate and enhance stakeholder contributions. In addition, some of the meetings could be held online; recent experience has shown that they can be effective and inclusive.

The adoption of product specific regulations would be done individually, when they are ready, avoiding a package approach that has been criticised by the ECA⁶²⁰, the European Parliament⁶²¹ and stakeholders.

Moreover, all the steps necessary to effectively follow this process should be codified by means of creating a handbook for policy officers. This handbook should provide guidance on the development of measures while a mechanism for updating it regularly should be set up. This mechanism should include among other things periodic meetings of policy officers who would flag identified areas for improvement, discussing remediation actions. In addition to the handbook, internal training modules/sessions could be set up.

⁶¹ See for example Ecofys, 2014 and CSES, 2012

⁶² ECA 2020 Special Report: EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance

⁶³ European Parliament resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC) (2017/2087(INI))

Measure 7a.2 Introduce possibility to collect data from manufacturers and retailers regarding regulated products sales and usage

This measure would set out the possibility for the European Commission to collect data from manufacturers for products regulated under SPI measures, in order to facilitate and speed up their review. These data would include how many products of each product model were placed on the EU market by the manufacturers. In addition, the European Commission could request retailers to share sales numbers of products covered or to be covered by SPI measures. These data allow to better estimate market penetration of various product types, linked to sustainability characteristics, at EU level, and would inform the studies for the revision of product specific regulations. Access to data would facilitate and speed up the potential review of existing product specific regulations not relying on the good will of manufacturers and retailers⁶⁴. The advantages of this measure will be effective in the medium term, when the time comes to review an SPI measure. The possibility to collect market data from manufacturers and retailers should not add much burden since these data are readily available. In addition, market data are already used under the current Directive in preparatory and review studies and consultants usually buy them. This would therefore add no complexity or additional delays; it would rather save time and facilitate the studies. Concerning third countries producers, the requirement to introduce data in the digital product passport will be mandatory. Already existing similar international standards (e.g. ISO/IEC 15459-6:2020 or ISO/IEC 16022:2006) foresees internal control checks, supported through IT systems, that impede the possibility of moving a product along the supply chain if certain information is not provided, or it is not provided in the correct way. Similar controls could also be performed by custom and market surveillance authorities.

Measure 7a.3 Expand provisions related to third party conformity assessment

Conformity with some of the requirements considered under Option 3 and 4 cannot be verified on the final product (e.g. the life-cycle carbon footprint of product cannot be assessed the same way as its energy efficiency). This means that enforcement needs to rely mostly on the relevant (technical) documentation. The involvement of independent third parties in the relevant pre-market conformity assessment procedure could provide an extra safeguard for the correct application of those requirements (if retained), thereby increasing compliance and ensuring the availability of complete and verified documentation.

The current framework does not provide for the structural involvement of independent third parties in conformity assessment procedures. The default procedures for ecodesign implementing measures do not provide for third party involvement, and measures can refer to procedures involving third parties only where ‘duly justified and proportionate to the risk.’ This possibility has not yet been taken up in existing measures.

This measure would ensure that the SPI allows for the structural use of conformity assessment procedures involving third parties. It would lay down the relevant conformity assessment module(s), as well as the requirements and process for selecting the third parties considered independent and capable to assess conformity with the relevant requirements⁶⁵. The SPI measures would specify which

⁶⁴ While preserving confidentiality when required, such mandatory data collection would allow to build anonymised datasets of a number of product key indicators (e.g. energy consumption, direct emissions, life cycle data). The availability of such anonymised datasets is key to enable an evidence-based transparent technical discussion with Member States and Stakeholders to define environmental (Ecodesign/SPI) criteria. The European Commission hosts for decades several of such very technical consensus-seeking processes to coin secondary legislation, one example being the ‘Sevilla Process’ run by DG Environment and DG JRC, which develops mandatory emission limit values and Best available Technique Documents (BREFS) under the Industrial Emissions Directive, including bespoke software hosted by the Commission (JRC) for confidential data and input storage, anonymization and sharing. https://en.wikipedia.org/wiki/Best_available_technology

⁶⁵ The Commission’s JRC could have a role in ensuring the long-term storage and methodological coherence of datasets

module(s) apply, allowing for the application of third party conformity assessment where feasible and appropriate for the relevant products and requirements.

Sub-option 7b: Strengthen market surveillance by Member States

This option includes all the measures provided for under option 7a.

As outlined in *Annex 15*, market surveillance is critical to ensure the effectiveness of the entire Ecodesign framework. As shown in the annex, the current level of enforcement of the Ecodesign measures is insufficient and market surveillance needs to be strengthened. This is all the more true in the context of the SPI. Effective enforcement of product sustainability requirements is essential to ensure the functioning of the internal market, provide a level playing field for economic operators, and to realise the environmental gains envisaged by SPI. It is therefore essential that the level of resources, both for the European Commission and the Member States is brought to an appropriate level and that adequate legislative and non-legislative measures are taken.

Strengthening enforcement, while not increasing the burden on economic operators, should involve increasing the frequency, effectiveness, and coordination of market surveillance activities. This requires the full commitment and involvement of national authorities, but also support from the European Commission. Whereas part of this will be achieved through the EU Product Compliance Network established by the Market Surveillance Regulation (EU) 2019/1020 and other horizontal measures, specific complementary measures can be undertaken through the Sustainable Products Initiative. The measures proposed under sub-option 7b and 7c focus on the requirements proposed under policy options 3 and 4 for the products under the extended scope of the revised Ecodesign Directive (see option 2). The measures intend to enhance the enforcement of the implementation of SPI requirements and do not aim at directly strengthening the overall enforcement of product legislation because the relevant internal market legislation has been just revised. The specific options foreseen in 7b and 7c also intend to take into account the specific challenges related to enforcing requirements on sustainability performance. Therefore sub-option 7b and 7c focus on SPI-related aspects coherent with the new market surveillance regulation.

Measure 7b.1 – Make relevant product information digitally available to market surveillance authorities

Access to technical documentation of products is key for market surveillance authorities (MSAs) to verify compliance of products, for example to compare it with test results. The Energy Labelling regulation⁶⁶ has spearheaded this by requiring the availability and centralised storage of such information for products under its scope in a digital format. However, the Ecodesign Directive does not provide for the publication of digital information.

Based on the lessons learned in the setting up of the energy labelling database (EPREL) and linked to the concept of the European Digital Product Passport (sub-option 4b and Annex 18), this measure will guarantee that the revised framework enables product specific rules to require suppliers (manufacturers, importers, authorised representatives) to make available relevant product information in a digital format, easily retrievable by Market Surveillance Authorities. This measure will allow for market surveillance authorities to access information without having to request it from suppliers. Specific implementation will be defined linked to the choices made under policy option 4. For example, in the absence of a European Digital Product Passport the way this information could be made available to Market Surveillance authorities through the EPREL database.

⁶⁶ 2017/1369

Experience shows that market surveillance will be further facilitated if digital information includes the tests and calculations made by the manufacturers to demonstrate conformity in line with the applicable conformity assessment procedure, where relevant also including information from third party conformity assessment bodies. This shall be part of the information provided.

Measure 7b.2 – Structural technical support to improve cooperation between MSAs and ensure sufficient capacities

Market Surveillance Regulation (EU) 2019/1020 foresees a role for the European Commission in helping improve coordination and cooperation between MSAs, as well as in ensuring they have sufficient capacity to carry out their tasks. This measure would build on this and give shape to this role in the specific context of the SPI.

Based on the priorities identified together with MSAs, the European Commission would – among other things:

- organise and fund joint market surveillance and testing projects in relation to specific products or requirements, to contribute to the sharing of capacities and knowledge and to increase enforcement;
- organise/provide support and funding for Member States' (joint) investment in market surveillance capacities, including equipment, IT tools and trainings, especially in relation to new kind of requirements;
- designate Union testing facilities in line with Article 21 of the Market Surveillance Regulation to ensure sufficient laboratory capacity, as well as to ensure the reliability and consistency of testing.

If needed, the European Commission would provide increased support to allow the relevant Administrative Cooperation Group⁶⁷ (ADCO) to meet more often, including by digital means. In addition to facilitating the harmonised application of SPI rules, increased ADCO coordination would serve to identify priorities for cooperation or Union support.

In line with Article 36 of the Market Surveillance Regulation, the Union may provide financial support for the realisation of these support actions. This measure would go beyond by committing the Union to provide financing for market surveillance support measures specifically in relation to the SPI, possibly using funds foreseen under the internal market pillar of the Single Market Programme.⁶⁸

These actions would, to the extent possible, be developed in the framework of the Union Product Compliance Network. They would further facilitate the correct understanding and harmonised implementation of SPI rules. Lastly, these actions can contribute to improving cooperation between MSAs and customs authorities.

Measure 7b.3 - Organise common trainings for staff of notified bodies, notifying authorities and MSAs

Option 7a.3 would enlarge the group of entities involved in implementing and applying SPI rules, adding notified bodies and notifying authorities. Incomplete knowledge or lack of understanding of

⁶⁷ European cooperation on market surveillance takes place through informal groups of market surveillance authorities, called Administrative Cooperation Groups. https://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation/administrative-cooperation-groups_en.

⁶⁸ https://eisma.ec.europa.eu/programmes/single-market-programme/internal-market_en

applicable rules on the part of these entities can hinder the proper application of product regulations. In addition, divergent interpretation and application of the rules creates market distortions and interfered with the functioning of the internal market.

The Market Surveillance Regulation ((EU) 2019/1020) mandates the European Commission to, in the context of the EU Product Compliance Network (EUPCN)⁶⁹, to organise common training programmes and personnel exchanges for MSAs. This measure would make use of that mandate by organising periodic trainings (at least once a year) with regard to the SPI framework, on for example:

- the correct interpretation and application SPI rules, including in the context of common simulated cases;
- methods and techniques relevant for applying or verifying compliance with SPI rules.

The trainings would be planned in close cooperation with Member States and the ADCO. They would be based on Member States' market surveillance planning and where relevant focus on products with higher compliance risks.

This measure would also complement the Market Surveillance Regulation by including in the common trainings also the staff of notified bodies and notifying authorities involved in pre-market conformity assessment procedure related to SPI requirements. This will further facilitate the development and maintenance of a harmonised approach to the implementation and enforcement of the SPI. In addition, the SPI could add minimum requirements for participation in relevant trainings, e.g. representatives of the relevant authorities would be required to take part in at least 1 relevant training annually.

Measure 7b.4 – Publish MSA penalties decisions

The Ecodesign Directives provides that the Member States shall lay down the rules applicable to infringements, and communicate them to the European Commission. The penalties shall be effective, proportionate and dissuasive. As a further deterrent of non-compliance, under this measure the European Commission will publish the penalties and enforcement decisions that are taken in the framework of the application of the SPI framework and which are communicated by national authorities by existing tools such as the Information and Communication System for Market Surveillance⁷⁰ (ICSMS), in agreement with them.

Measure 7b.5 – Create a benchmark and a reporting obligation for Member States

The SPI framework will require Member States to report, in addition to the reporting under ICSMS and on the basis of what they indicated in their National Market surveillance programme, on their activities related to sustainable products. The statistical data that MSAs would provide to the European Commission following their activities as laid down in Regulation 2019/1020 should allow the separation of the data on actions they have taken related to SPI. The European Commission could then, possibly in the context of the annual report published on the ICSMS, create a benchmark and publish the performance of the MSAs in relation to SPI-related activities.

⁶⁹https://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation_en/eu-product-compliance-network_en

⁷⁰ ICSMS (Information and Communication System for Market Surveillance) is the comprehensive communication platform for market surveillance on non-food products and for mutual recognition for goods. <https://webgate.ec.europa.eu/icsms/?locale=en>.

Measure 7b.6 – Establish requirements for market surveillance checks

It is essential for the effectiveness of the SPI that MSAs carry out compliance checks on an adequate scale. The level playing field can only be safeguarded and the potential environmental improvements can only be realised if compliance with sustainability requirements is checked systematically, thereby removing non-compliant products from the market and creating effective deterrence.

Under this option the SPI would provide for the setting of requirements on the frequency of checks to be performed in relation to specific products and/or requirements. These requirements could take the form of:

- common criteria to be used by MSAs to establish the frequency of check in relation to specific products (making use Article 11(4) of the Market Surveillance Regulation);
- minimum amounts of checks to be performed in relation to specific products, for example based on the amount of products made available on national markets (based on Article 8 of Regulation (EU) 2018/858).

In addition, the SPI would allow to prescribe the kind of checks to be performed and the methods to be used for those checks, where feasible and appropriate in relation to specific product.

To support MSAs in realising the potential additional efforts (and to ensure they do not come at the expense of other efforts) the SPI would foresee targeted financial support, possibly using funds foreseen under the internal market pillar of the Single Market Programme.⁷¹

Sub-option 7c: Reinforce EU level implementation and complement Member States' market surveillance

While options 7a and 7b rely on the strengthening and reinforcement of existing capacities, Option 7c provides for the creation of complementary EU level capacities to, where needed and appropriate, support or reinforce the implementation and enforcement of the SPI. The envisaged capacities are described in the measures below. This option complements options 7a and 7b.

Measure 7c.1 – Complement national market surveillance where needed

With this measure, would be allowed, at its own expense, to organise and carry out market surveillance actions that are independent of those carried out by Member States under their national market surveillance obligations, in close coordination with them.

This capacity would be used where necessary and appropriate to complement Member States' actions while respecting the principle of subsidiarity. In planning potential supporting activities, the European Commission would take account of available data on the compliance of specific products and in relation to specific requirements, as well as of the national market surveillance strategies drawn up pursuant to Article 13 of the Market Surveillance Regulation ((EU) 2019/1020). Activities would be closely coordinated with Member States in the SPI ADCO and, where relevant, the EU Product Compliance Network. Before the European Commission carries out market surveillance activities, it would notify the Member State where the relevant products were made available on the market. The SPI would include a general obligation for Member States to cooperate with the European Commission when it carries out market surveillance activities.

If during these activities the European Commission establishes non-compliance, it should be entitled to initiate Union-wide remedial actions to restore the conformity of the products concerned. To this

⁷¹ https://eisma.ec.europa.eu/programmes/single-market-programme/internal-market_en

end, the SPI would provide for the adoption of implementing measures containing harmonised corrective or restrictive measures to be implemented by Member States, analogous to decisions to widen national market surveillance measures to the whole EU taken in the context of the Union safeguard procedure that is a standard part of EU product legislation.⁷²

This measure would be based on provisions similar to those included in Regulation (EU) 2018/858 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles - in particular Articles 9 and 53 thereof.

Measure 7c.2 – Product monitoring and EU testing capacity

This measure provides for the creation, where relevant and in complementarity with Member States needs and capacities, of product monitoring and testing facilities at European level, to assist with both upstream definition of product requirements and downstream market surveillance.

In the context of ecodesign preparatory and review studies, the European Commission currently often relies on external consultants for determining product characteristics (including by conducting product testing in some cases). Increasing the European Commission's capacity to test products and verify measurement methodologies will allow for faster development of product regulations, and faster adaptation capacity to new market developments, improving the appropriateness of the requirements, and in particular the verification tolerances, relying, where necessary, on external laboratories, and acting in a coordinated manner with national market surveillance actors.

These new facilities could also be used in the framework of measure 7c.1, entrusting the European Commission with a market surveillance mandate. They could be designated as Union testing facilities, within the meaning of Article 21 of Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products, with the objective to “contribute to enhancing laboratory capacity, as well as to ensuring the reliability and consistency of testing, for the purposes of market surveillance within the Union”.

Measure 7c.3 – Assistance to implementation for suppliers and MSAs

The process of verifying the correct implementation of ecodesign rules can be long and complicated. For manufacturers or importers, questions frequently arise on specificities of the implementing regulations, trying to make sure that their understanding of the rules is accurate. Although this can be addressed partly by making the implementing rules as straightforward as possible, the important number of rules applying can make it complex for stakeholders that will seek confirmation of their interpretations. Similarly MSAs may lack capacity or specific knowledge to perform their tasks and verify the compliance of relevant products covered under SPI.

Assistance would be provided to suppliers and MSAs by a dedicated EU level service, answering specific queries through non-binding advice, but also in the form of trainings and presentation for stakeholders, to facilitate the correct understanding and implementation of rules. This measure would go further than measures 7b.2 and 7b.3 in that it would also include assistance also to manufacturers (in addition to MSAs). It would provide a dedicated and permanent channel for assistance.

⁷² See for example Article 39 of the Fertilising Products Regulation (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2019:170:FULL&from=NL>).

Measure 7c.4 – Third party channel for market surveillance

Citizens and compliant suppliers are the first affected by the placing on the market of non-compliant products, as this affects their choices and creates market distortions. These stakeholders can also be the first to discover that a product they have acquired or the product of a competitor is not compliant. Creating a reporting channel for third parties to report suspected cases of non-compliance will support the work of Market Surveillance authorities by allowing them to focus on likely cases of non-compliance. This reporting channel will be open to all stakeholders, centralised, and allocate the verification of reported cases to the most relevant Market Surveillance actors.

Options discarded at an early stage

1. Discarded measure under option 6 in the form of an obligation for companies to take back, or donate for use, unsold products

This measure sets an obligation for companies to take back or donate unsold products, and to declare their amount, to foster greater transparency. It has been discarded at an early stage due to the costs and the administrative burden associated to it, which are deemed not proportionate to the environmental and social benefits it could generate. Furthermore, it has significant overlap with the ban, but would be a less efficient means of contributing to its objectives.

Description of the measure

This measure would include creating dedicated registries in Member States for specific product groups to monitor the amounts of unsold products. It would also set obligations on relevant actors in the value chain (e.g. producers, importers, retailers) to take back or donate for use unsold products and to monitor and report their amount to national relevant authorities. To preserve commercial confidentiality, only aggregated figures per type of products could be made publicly available. The diffusion of the figures could force a whole value chain to prevent destruction of the unsold goods and eventually improving its stock management processes.

For some product groups, registries already exist in Member States (e.g. in the context of EPR for WEEE) where the producers declare the products placed on the market every year. In the implementation of the measure, it would be explored if an additional field could be added in such registries where the unsold products could be declared. There are several possible ways of Registries could be set up at national or EU level, including through the refinement of existing databases. The obligation on stakeholders to report on unsold goods could be considered as part of the revision of the Ecodesign Directive, or through a new legislative measure.

Administrative burden

Administrative burden for economic operators

Companies will be impacted by the registry as well as the obligatory takeback scheme. The cost of the registry will be similar to the one incurred by businesses concerned by the WEEE registry for instance. A harmonised format for the registration of EEE producers was introduced with European Commission Implementing Regulation (EU) 2019/290, reducing the previous administrative burden associated with determining what unique information a Member State or EPR compliance system

requires to register and where to find this information⁷³. A harmonised format would be needed immediately to avoid such administrative burdens.

Cost estimation

No estimates of complying with a comparable registry (e.g.: the WEE registry) from a cost perspective have been made. Estimates, based on input from industry associations, quantified a cost increase of 5% for businesses overall for this policy option. The strongest cost increases are associated to administrative costs (3.88%), operation and maintenance (2.75%) and other costs (3.50%).

As shown in Annex 10, costs estimates for industry have been provided by nine industry associations representing the battery, home appliances, packaging and textile industries. It emerged that the higher cost increase is related to the obligation for companies to take back unsold products.

Administrative burden for the European Commission

The administrative burden would come primarily from the development and monitoring of the registry on unsold goods.

Administrative burden for Member States

The administrative burden will be focused primarily on the development and monitoring of the registry on unsold goods. It will require a close cooperation with the European Commission.

According to estimates from the Impact Assessment, at the MS level more than 2 FTEs are needed to collect and treat data provided by manufacturers and importers on the number of unsold products. The take back obligation for firms might not impact MS equally since it might already be implemented (for example Belgium). The donation schemes are also widely practised at the municipal level according to the interviewees.

Direct economic impact for businesses

CNBC reports that the average return represents 30 percent of the purchase price (clothing returns can be closer to 40%⁷⁴). Returns represent up to 10% of the annual sales of online retailers. It has been further estimated that retailers need to sell at least three units of the same product just to recover the cost of one return. Managing returns has already become a priority for retailers, by increasingly turning to third parties to optimise the efficiency for returned products and finding the best new route for them.

Although a relatively new business model, the benefit reverse logistics brings to companies ranges from three to 15 percent of the overall bottom line, according to the Reverse Logistics Association (RLA) estimates⁷⁵. Companies active in electronics have turned the logistics function from a cost centre to a profit source as well as decreasing their processing costs by up to 50%, reducing the returned goods inventory.

Environmental and social benefits

A take back scheme with an obligatory declaration of unsold goods should yield similar environmental effects as the ban, although to a lesser scale as businesses will not be forbidden to destroy the final product. The impact of reverse logistics on the environment is considered green as the process includes remanufacturing, refurbishment, recycling, reuse, or asset recovery. Though

⁷³ European Commission. Study on harmonisation of the format for registration and reporting of producers of Electrical and Electronic Equipment (EEE) to the national register and on the frequency of reporting (2016)

⁷⁴ CNBC. A \$260 billion 'ticking time bomb': The costly business of retail returns. <https://www.cnbc.com/2016/12/16/a-260-billion-ticking-time-bomb-the-costly-business-of-retail-returns.html> 2016

⁷⁵ Full Circle: Reverse Logistics Keeps Products Green to the End <https://www.inboundlogistics.com/cms/article/full-circle-reverse-logistics-keeps-products-green-to-the-end/>

effective reverse logistics operations, companies are able to cut out inefficient return processes that result in unnecessary transportation moves, helping to reduce carbon emissions and improve air quality.

The social impact is expected to be similar to the ban under sub-option 6b. Companies will increase their donations or second-hand sales as a result of the take back scheme. However, estimations regarding the percentage of donated goods are usually company specific and not available per sector, so it is impossible to quantify the magnitude. The working conditions of workers employed in reverse logistics and in the handling of stock management and returns are generally poor. In Europe, several unions have gone on strike to protest against poor working conditions. The implications of this sub-option on the working conditions of those handling returned items and stock management can be negative.

2. Discarded measure under option 3 to put in place a Sustainable Products Framework

This measure would take a longer-term view by establishing a new framework legislation with a legally-binding, long-term plan, including sustainability principles and targets. The measures under sub-option 3a and 3b would feed into and help to implement and achieve the targets and sustainability principles set out in the framework legislation. The difference with sub-option 3a and 3b is that this measure would integrate the Ecodesign directive into a larger framework, together with directly applicable principles and targets, as a new approach to achieve the general objective.

The new framework legislation would contain:

- A set of overarching and directly applicable **Sustainability Principles**, intended to apply to all products in SPI scope, in order to steer product design and foster sustainability and circularity of value chains. The application of these principles would take the following forms:
 - At the level of Member States: Member States national and local governments would be required by SPI to follow these principles as a priority when setting up and implementing policies in relevant policy fields (explicitly mentioned in SPI), in particular incentive schemes, public procurement policies, national regulations on products and consumption compatible with EU Internal Market rules. By comparison with the application of the ‘waste hierarchy’ in the Waste Framework Directive, Member States would have the possibility to adapt the application of Sustainability Principles to the national context and administrative framework. National instruments could implement one Principle in particular, as long as their implementation does not conflict with the other Principles.
 - At EU level, the principles would be implemented through Ecodesign measures and would guide the preparation of other EU legislation and instruments. In the former case of Ecodesign, the principles would be integrated in SPI methodology and guide the preparation, implementation and monitoring of measures. In the latter case of other EU legislation and instruments, as there is no hierarchy between EU pieces of secondary legislation, the Sustainability principles would be applied as non-binding policy guidance and could inspire, for example, the setting of priorities in financial instruments and the implementation of product-related legislation outside of SPI (for construction products for example).

The following principles would be included in the proposed framework legislation, with the necessary provisions to further codify them and their application:

- **Principle of design for sustainability:** i.e. the design of a product has to be conducted with a view to optimise product lifetime, minimise environmental and social footprint along their life cycle and to use safe, sustainable, recyclable and to the extent possible

recycled materials; production lines, value chains and distribution networks should also be conceived and managed with a view to maximise their sustainability.

- **Principle of sustainable sourcing of materials:** i.e. the purchaser of materials to be included in a product is required to take steps to minimise the negative environmental and social impacts associated with the material extraction and transformation, taking account of the availability or not of recycled materials and of the objective of strategic autonomy of EU economy.
 - **Principle of sustainable production:** i.e. the manufacturer of a product is required to take steps to minimise the negative environmental and social impacts of the manufacturing processes and to maximise the well-being of the workers and communities involved in the process.
 - **Principle of management for circularity:** i.e. relevant supply chain actors (manufacturers, waste managers etc.) are required to take steps to ensure that the maximum usage value of a product is retained; whenever technical and economic conditions allow, and without creating negative environmental and social impacts, repair, upgrade and reuse should be preferred to remanufacturing, itself preferable to material recycling and other forms of disposal.
 - **Principle of responsibility for information:** i.e. each party in the value chain of a product is required to take steps to keep track of and share along the value chain the information necessary for other parties to evaluate the sustainability of the product concerned and to perform value-retaining operations on it.
 - **Principle of avoidance of destruction:** i.e. the usage value of products must not be deliberately destroyed as long as a technically and economically viable solution exists without creating negative and social impacts.
- Long-term targets on the achievement of quantified indicators related to the objectives of this legislation, including:
- Reduction of the impacts of EU production and consumption to respect planetary boundaries;
 - Resource productivity and/or material footprint, as an indicator for decoupling of resource use from economic prosperity;
 - Percentage of recycled materials in production – CEAP includes the objective of doubling EU circular material use rate in the coming decade;
 - taking into account the EU’s legal obligation to reach net-zero GHG emissions by 2050).

These targets would not be legally binding but they would allow to clearly set the objectives for SPI stakeholders’ community and monitor the contribution of SPI implementation to their achievement (or distance to achievement) in evaluation and reporting. They would be monitored through a SPI ‘accounting tool’ similar to the current ‘Ecodesign accounting’ on GHG reduction and energy efficiency.

Economic impacts

It is expected that the economic impacts on businesses and public authorities would be significant, with potential new costs for compliance and enforcement of requirements. From the estimates provided by industry representatives in targeted interviews (see Table 72 in Annex 11), it can be inferred that the increase in costs associated with this measure is likely to exceed 5% of current compliance costs. The impact on consumers will depend on the manner in which life-cycle costing is

integrated in the framework⁷⁶. However, these impacts could stabilise or reduce over time once the new framework is in place for a few years, and starts delivering its benefits.

Furthermore, there could be issues of coherence with potential overlaps and incoherence if Member States develop national legislation based on SPI Sustainability Principles, additional to the EU requirements applicable to potentially the same products. The measures taken by Member States would weaken the Internal Market for sustainable products.

Environmental impact

Though the legal provisions for the application of Sustainability Principles and the level of ambition of long-term targets are not elaborated in detail, additional environmental benefits would presumably be achieved in comparison with 3b.

⁷⁶ In the current Ecodesign Directive, Least Life Cycle Cost (LLCC) ensures that the consumer does not pay a significantly high cost. However, the application of the method to impacts other than energy consumption raises some methodological challenges. See Annex 16.

Annex 10: Impacts of the policy options

1. INTRODUCTION

This Annex presents the analysis of the policy options described in the preceding section, and assesses how they contribute to reaching the specific objectives. Each policy option has two or three sub-options. Overall, approximately 60 specific measures are analysed across all the sub-options.

For each of these policy options this section includes a proportionate analysis of:

- economic impacts (positive and negative), covering opportunity costs, compliance costs and administrative burden (for businesses and for public authorities),
- environmental impacts,
- social impacts,
- stakeholders' views.

The analysis considers the sub-options in a given policy option in isolation (i.e. 2a compared to 2b, and to 2c) and does not at this stage consider the interaction between sub-options across options. This is considered reasonable as the options have been constructed to be largely independent, but an analysis of the synergies between them and hence of the **overall preferred option** is presented later.

As is currently the case with the Ecodesign Directive, the actual impacts, both positive and negative, on the economy and the environment, and in terms of administrative burden for all stakeholders, depend to a large extent on the number of products regulated and the stringency of requirements to be set in subsequent measures, that will themselves be subject to more detailed impact assessments

The below analysis is therefore focused on the **potential** that would bring a revision of the Ecodesign Directive, without prejudice to the actual impacts, that will need to be identified individually, for each product specific regulation, through their own impact assessments.

2. OPTION 1 - BUSINESS AS USUAL – GENERAL ASSUMPTIONS IN IMPACT ANALYSIS

The Business As Usual scenario is based on the absence of SPI with a 2030 horizon. The scenario assumes the existing current and forward looking trends and problems, and a policy framework that will influence these trends and therefore could have economic, environmental, social and other implications. Ecodesign legislation will continue targeting energy-related products (including ICT products) and focus on delivering improvements on energy efficiency and some other environmental performance aspects of target products, in line with the requirements adopted in the latest regulations. Due to current dynamic evolution of the EU policy landscape towards CEAP and Green Deal, a number of other product related legislations are expecting revisions, which are likely to address circular economy goals. In addition, new EU initiatives e.g., on empowering consumers for the green transition, substantiating green claims are expected to facilitate transparency around sustainability of various products. The EU will maintain its voluntary instruments (e.g., Ecolabel, GPP) and funding and investment programmes for innovation, research, development, and market uptake are expected to continue supporting sustainable products development and uptake.

Within the horizon of 2030 in the ‘no SPI’ scenario, social, economic, environmental benefits to be delivered by the EU product policy instruments will be tangible but are difficult to quantify. However, an uneven approach in support, less inclusive product scope, as well as missed synergies with SPI will prevent further maximising the cumulative impact of the EU product policy portfolio.

Further analysis of the baseline specific to the different policy options is provided below.

3. OPTION 2: EXTENSION OF THE PRODUCT SCOPE OF ECODESIGN LEGISLATION

3.1. Overview

Overview of policy option 2

Sub-option 2a: Extension to CEAP priority products (not addressed through separate legislation), and energy-related products, including means of transports, textiles, furniture, high-impact intermediary products and chemicals.

Sub-option 2b: Extension beyond sub-option 2a to all physical goods.

Sub-option 2c: Extension beyond sub-option 2b to all services.

Overview of Policy Option 2

Sub-option 2a: Extension to Circular Economy Action Plan priority products (not addressed through separate legislation). Energy Related products, including means of transports, +

- Textiles,
- Furniture,
- High impact intermediary products,
- Chemicals

Sub-option 2b: Extension beyond sub-option 2a to all physical goods

Sub-option 2c: Extension beyond sub-option 2b to all services

3.1.1. Assumptions used in the analysis

- The main levers for environmental and economic effects are the number and types of products regulated under the scope extension, and the corresponding improvement potentials.
- It is assumed that the requirements of an extended Ecodesign Directive can be brought about by several means (lifetime extension through availability of spare parts, recyclability through design, etc.), depending on the product under consideration. Not all of these measures can be explicitly portrayed within the sub-options, so more general improvement potentials have to be assumed based on experience with such measures (e.g., under the headline of circular economy actions).
- The improvement potentials for some product groups are extracted from the literature. For product groups for which no information is available, assumptions of maximum improvement potentials are made (see Annex 4).

3.1.2. What problem and specific objective does this option address

The extension of the product scope of the Ecodesign legislation addresses the problem that product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects. By bringing more products into the scope of Ecodesign, this policy option thus addresses specific objective 1: improve product sustainability. The sustainability improvement spans beyond use-phase energy consumption to also tackle impacts at other stages of the product life cycle.

Stakeholders' views on PO2

Stakeholders showed some different views: while quite broad support for extension of the ecodesign instrument emerged from a number of stakeholder categories some asked for the (initial) focus of the SPI to be on the priority sectors of the CEAP, while others called for a broad extension to all products and for the future framework to retain flexibility so that updates to rules remain possible where needed. No particular support for

extension to services emerged. Industry representatives tended to cautiously support the extension of Ecodesign Directive, but many underlined the need to retain a product-specific approach if the needs and complexities of different sectors are to be taken into account. They called for individual assessments to be carried out before laying down concrete rules for each new product added to the scope. Other stakeholders – in particular Ecodesign practitioners from the public authorities – tended to be conservative regarding the scope of Ecodesign: energy-related products and the other products are considered to have different features deserving different legislative tools. Stakeholders across the categories underlined the need to ensure synergies with existing EU legislation and avoid overlap on sustainability or design aspects, for the purpose of avoiding extra administrative burden. SMEs⁷⁷, in particular, considered that products sold in the EU are not sustainable because there is no harmonised set of requirements to foster sustainable design of products, nor to foster sustainable services, indicating an inclination to expand the scope to other products as well as services.

Enforcement and market surveillance activities (e.g., inspections or audits) are seen as necessary to accompany the implementation of the SPI and their robustness has an impact on how far to go when extending the scope.

The targeted survey provided a list of value chains which, according to the CEAP, should be included in the new scope of the Ecodesign Directive, beyond energy-related products. The respondents indicated that the following five sectors provide the highest circularity potential: packaging (71% of respondents), plastics (65%), textiles (63%), electronics and ICT (62%), and waste collection, treatment and disposal services; materials recovery services (60%).

One of the workshops gathered 73 MS representatives where all policy options were discussed. Concerning PO2, participants expressed support for a scope of the SPI that would be open, and agreed with the list of products suggested for priority action (see list in sub-option 2a). They felt the inclusion of services at this point in time might be premature. Another workshop was organised with 180 stakeholders from various sectors. Here, some stakeholders argued that the European Commission needs to be careful in expanding Ecodesign to other non-energy related product sectors, such as construction materials, for which comparable legislation, that addresses many sustainability aspects, already exists. Instead, there should be a recognition and coherence with sectoral legislation. A package approach should be dropped to facilitate adoption of specific production measures.

3.2. Baseline for PO2

In the absence of the SPI, the product scope of the Directive will remain on energy-related products, including ICT products. New products will be regulated subject to the resources available at the Commission to launch new implementing measures, but the Commission's efforts will be mainly focused on the revision of existing product legislation.

The current Ecodesign legislation covers energy-related products. While not all energy-related products are currently regulated under Ecodesign, the regulated products still make up a considerable fraction of energy consumption by energy-related products used in the EU, more specifically of energy-using products.

With this scope, the current Ecodesign legislation covers about 4% of the European domestic final demand, 3% of employment, 49% of GHG emissions, 59% of acidification, 50% of resource depletion (raw materials) and 51% of primary energy consumption (see Table 26).

⁷⁷ SMEs participating in the OPC are defined as participants representing a company/business organisation with less than 250 employees

Table 26 Coverage of current Ecodesign products scope with respect to economic and environmental indicators; percentages represent shares of EU totals; source: own calculations based on EXIOBASE v.3.8.1 (see Annex 4 for details)

| Economic importance | | Environmental impacts | | | | | | | | | | |
|---------------------|---------------------------|-----------------------------------|-------------------------------|-----------------------------------|--|------------------------------|-------------------------------|----------------------------|----------------|---|---|---------------------------------|
| Final demand [bn€] | Employment [1000 Persons] | GHG emissions [Mt CO2e emissions] | Human toxicity [kt emissions] | Particulate matter [kt emissions] | Photochemical ozone formation [kt emissions] | Acidification [mt emissions] | Eutrophication [kt emissions] | Ecotoxicity [kt emissions] | Land use [km2] | Resource depletion, water [Mm3 consumption] | Resource depletion, raw materials [Mt extraction] | Primary energy consumption [PJ] |
| 483 | 7,009 | 2,366 | 37 | 2,201 | 6,951 | 2,083 | 4,902 | 49 | 302,038 | 35,803 | 7,375 | 32,381 |
| 4% | 3% | 49% | 22% | 25% | 27% | 59% | 16% | 21% | 5% | 4% | 50% | 51% |

3.2.1. Economic impacts

3.2.1.1. Administrative burden

Administrative burden for economic operators

The BAU administrative burden on economic actors will depend on the products effectively regulated, and the types and stringency of product requirements. The 2015 Impact assessment on Review of the Energy Labelling Directive and the Ecodesign Directive, estimated the combined administrative costs for manufacturers and dealers to be between €10 and 16m per year. While costs for businesses do not necessarily correlate with the number of products under regulation, an increase in the latter can be used as a rough indicator of the potential increase in BAU administrative costs for businesses.

Administrative costs for the European Commission

Currently, about €0.4m per product are used for preparatory studies and impact assessment support studies. The simplification of the process is expected to lead to a €50k reduction in these costs. Under BAU, the number of studies needed will depend on the available resources. These are considered to be insufficient and would need to increase by about 13 FTE to manage the existing product groups regulated. It will vary between 3 per year based on current resources or higher in the case with reinforcement,

- Administrative burden for Member States

BAU will not lead to a significant change in the market surveillance needs for EU Member States. Any change will arise from additional products being regulated. It is estimated that the increase in costs is proportional to any increase in the number of products covered by implementing acts.

3.2.1.2. Direct economic impact for businesses

The impacts of Ecodesign for Energy Related products have been assessed through impact accounting. While the effect will depend on the specific product, it is assumed that any new product requirements for energy-related products will have broadly comparable economic effects.

3.2.1.3. Indirect economic impact for businesses

No additional indirect economic impacts for businesses are expected.

3.2.1.4. Economic impact for citizens

The EIA Status Report 2020 savings on consumer expenditures of €60 billion per year induced by the current Ecodesign legislation (in combination with the EU Energy Labelling legislation). These savings comprise €75 bn energy savings and €8 bn reduced expenditures for consumables (including paper and toner for imaging equipment, water and detergents for washing machines and dishwashers, bags for vacuum cleaners, shielding gas, filler wire and electrodes for welding equipment), minus €23 billion per year increased acquisition costs for regulated, and thus more expensive, products. Further changes under BAU are assumed to have comparable economic impacts.

3.2.2. Environmental impacts

The actual progress under BAU will depend on the rate at which existing product regulations can be reviewed and new products addressed.

Under the assumption of maximum improvement potentials (see Annex 4), BAU would theoretically be able to provide considerable benefits in all environmental impact categories, ranging between 0.4 and 8.8%, depending on the impact category. However, it should be noted that the products covered in this analysis are not all those currently in scope of Ecodesign. Based on the estimated primary energy coverage these figures should be multiplied by 1.1. In reality the achievable savings will be lower since it will not make sense to regulate all products in scope.

Table 27 Maximum improvement for BAU as a % of EU totals

| GHG emissions | Human toxicity | Particulate matter | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|---------------|----------------|--------------------|-------------------------------|---------------|----------------|-------------|----------|---------------------------|-----------------------------------|----------------------------|
| 7.4% | 3.3% | 3.8% | 4.1% | 8.8% | 2.4% | 3.2% | 0.7% | 0.4% | 7.5% | 7.7% |

3.3. Sub-option 2a: Extension to Circular Economy Action Plan priority products

Ecodesign currently covers “energy-related products”. Under this sub-option, the Ecodesign scope will be extended to a limited list of priority products showing the highest environmental impacts and best improvement potential from a sustainability and circularity point of view. This sub-option builds notably on the results of a Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains⁷⁸, the European Commission Staff Working Document titled “Sustainable Products in a Circular Economy - Towards an EU Product Policy”⁷⁹ and an Environmentally Extended Multi-Regional Input-Output (EE-MRIO) Analysis⁸⁰.

Accordingly, under **sub-option 2a**, the new SPI legislation⁸¹ would cover:

- energy-related products (including means of transport)⁸²,
- textiles,
- chemicals⁸³,

⁷⁸ Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains, IVM et al. for the European Commission, 2014

⁷⁹ SWD(2019)91 final

⁸⁰ Using Exobiase (<https://www.exobiase.eu/index.php>), for further details refer to annex 4.

⁸¹ Please see Annex 14 for explanation of articulation with existing legislation

⁸² This corresponds to the product coverage of the Ecodesign Directive, with the exemption of means of transport, currently excluded.

⁸³ Understood as intermediate products (e.g. industrial solvents) or final products e.g. such as detergents or cosmetics. Where chemicals are destined/used for food related purposes and are not considered as food or feed, they will be subject to the relevant sectoral legislation, including the future sustainable food systems framework legislation, as announced in the Farm to Fork Strategy

- high-impact intermediary products, and
- furniture.

This extension of scope would encompass products responsible for 19% of EU domestic demand, 19% of employment, 14% of EU GHG emissions, 12% of acidification, 18% of resource depletion and 15% of primary energy consumption. Including the baseline the total scope of SPI would cover products representing 23% of European domestic final demand, 22% of employment, 63% of GHG emissions, 71% of acidification, 68% of resource depletion (raw materials) and 66% of primary energy consumption. Table 28 provides an overview of the economic importance and environmental impacts.

Table 28 Potential coverage of baseline and sub-option 2a products scope with respect to economic and environmental indicators; percentages represent shares of EU totals; source: own calculations based on EXIOBASE v.3.8.1 (see Annex 4 for details)

| Economic importance | | Environmental impacts | | | | | | | | | | |
|---------------------|---------------------------|--|-------------------------------|-----------------------------------|--|------------------------------|-------------------------------|----------------------------|---------------------------------------|---|---|---------------------------------|
| Final demand [bn€] | Employment [1000 Persons] | GHG emissions [Mt CO ₂ e emissions] | Human toxicity [kt emissions] | Particulate matter [kt emissions] | Photochemical ozone formation [kt emissions] | Acidification [mt emissions] | Eutrophication [kt emissions] | Ecotoxicity [kt emissions] | Land use [thousands km ²] | Resource depletion, water [Mm ³ consumption] | Resource depletion, raw materials [Mt extraction] | Primary energy consumption [PJ] |
| 3,079 | 47,004 | 3,030 | 103 | 5,230 | 11,650 | 2,531 | 9,524 | 134 | 1,381 | 136,196 | 10,014 | 41,698 |
| 23% | 22% | 63% | 60% | 60% | 46% | 71% | 31% | 58% | 23% | 14% | 68% | 66% |

3.3.1. Economic impacts

3.3.1.1. Administrative burden

Administrative burden for economic operators

The administrative burden on economic actors will depend on the products effectively regulated, and the types and stringency of product requirements. It is broadly analysed in the following sections, and will be further looked at in individual, product-specific or group of products impact assessments. In the 2015 Impact assessment on Review of the Energy Labelling Directive and the Ecodesign Directive, the administrative costs for manufacturers and dealers combined were estimated to be between 10 and 16 million EUR per year. While the costs for businesses do not necessarily correlate with the number of products under regulation, the increase in the latter within the scope extension can in any case be used as a rough indicator of the potential increase in administrative costs for businesses. The scope extension under sub-option 2a would roughly imply a doubling of the number of products effectively regulated, which would imply an increase in administrative costs for businesses between 10 and 16 million EUR per year.

Administrative cost for the European Commission

Currently, about EUR 400 000 per product are used for preparatory studies and impact assessment support studies. The simplification of the process is expected to lead to a reduction in these costs of about EUR 50 000. The scope extension under sub-option 2a would roughly imply a doubling of the

number of products effectively regulated. In contrast to the administrative costs for businesses, the personnel requirements and expenses for preparatory studies can be assumed to be more directly tied to the number of products under regulation. Assuming similar personnel requirements of approximately 0.75 FTE of Commission staff per product group, plus management and support staff, and the reduced expenses for preparatory studies linked to the streamlining of the process, the coverage of 27 product groups would require around 25 FTEs, which equate to about EUR 4 million in personnel costs per year once all products are regulated, plus an additional EUR 10 million for preparatory studies. The latter would be spread across several years, depending on the implementation schedule.

Administrative burden for Member States

The extension of the scope of the Ecodesign Directive will increase the market surveillance needs for EU Member States by increasing the number of products to be looked at. Considering that EU Member States are required to guarantee that Market Surveillance Authorities have the necessary resources and knowledge to perform their functions, the scope extension under sub-option 2a will likely increase administrative costs for EU Member States. It can be estimated that the increase in costs is proportional to the increase in the number of products that will be effectively covered through SPI acts. For example, in the Netherlands these costs are in the order of 700-800 000 EUR/year.

3.3.1.2. Direct economic impact for businesses

The Ecodesign provisions which are more important for non-energy-using products, relating to e.g., recycled content and extended product lifetimes, will likely lead to a reduction in the demand for primary materials and new products, while at the same time the demand for spare parts and repair services is expected to increase. This will likely lead to a reduction in revenues for some industries, such as raw material processors, while others will benefit, such as repair and maintenance services. The sum of these impacts is difficult to estimate, since a multitude of effects happen concurrently. A few studies attempt to quantify these overall economic effects, coming to partly diverging conclusions.

A recent study by Cambridge Econometrics, Trinomics and ICF⁸⁴ attempts to quantify the macroeconomic impacts of circular economy measures in the EU for the five product groups of food products and beverages, motor vehicles, construction, electronics and electrical equipment, and waste collection and treatment. For each product group, several assumptions are made regarding changes in production processes (e.g., from primary to recycled input), consumption (e.g., more demand for repair services, less demand for new products) and investment expenditures (e.g., for recycling infrastructure), ranging from 2.5 to 50% compared to the baseline values. The scenarios constructed in this way do not, however, consider administrative costs, while essentially assuming a fully elastic money supply. In combination, the scenarios are estimated to lead to an increase of EU GDP between 0.3 and 0.5%. In contrast, Donati et al. (2020)⁸⁵ estimate a considerable GDP reduction of approximately 7% for the EU, based on a combination of measures including delayed replacement, use intensification, design improvements of products, sharing models and scrap diversion. However, this figure can be considered an upper bound of the potential negative effects and is a result of partially restrictive modeling assumptions. Finally, Wiebe et al. (2019)⁸⁶ analyse a circular economy scenario at the global level, including broad measures such as recycling, reducing, and repair, reuse

⁸⁴ Cambridge Econometrics, Trinomics and ICF (2018): Impacts of circular economy policies on the labour market. <https://op.europa.eu/en/publication-detail/-/publication/fc373862-704d-11e8-9483-01aa75ed71a1/language-en>

⁸⁵ Donati, F.; Aguilar-Hernandez, G. A.; Sigüenza-Sánchez, C. P.; Koning, A.; Rodrigues, J. F.D.; Tukker, A. (2020): Modeling the circular economy in environmentally extended input-output tables: Methods, software and case study. In *Resources, Conservation and Recycling* 152, p. 104508.

⁸⁶ Wiebe, K. S.; Harsdorff, M.; Montt, G.; Simas, M. S.; Wood, R. (2019): Global Circular Economy Scenario in a Multiregional Input-Output Framework. In *Environmental Science & Technology* 53 (11), pp. 6362–6373.

and service. While they do not provide GDP results for the EU, largely positive employment effects of up to 6% also indicate positive effects on the European GDP.

Potential increases in costs for SME need to be closely monitored and correlated with potential improvement of their market positioning. Among the product groups to be included in the scope, this is especially the case for the construction sector, which has the highest share of SMEs among the added product groups.⁸⁷

3.3.1.3. Indirect economic impact for businesses

Structural shifts are expected in the economy, resulting from less demand for traditional manufacturing and more for repair and related services, etc. The literature is inconclusive on the overall effect. As a result, these effects are difficult to quantify.

3.3.1.4. Economic impact for citizens

Unlike energy-using products, in the case of non-energy-using products, consumers will not experience savings through energy demand reductions. Instead, savings may materialise in the form of fewer purchases of new products (because products can be kept longer in use due to Ecodesign provisions). This demand reduction may be countered by increased demand for spare parts and repair services. As with the economic impacts for businesses, however, the net effect is difficult to quantify.

3.3.2. Environmental impacts

While the EIA Status Reports use product-level calculations to arrive at the aggregate improvement potential of Ecodesign, this is unfeasible for the scope extension beyond energy-related products, since a multitude of measures are possible to reduce the environmental impacts beyond the use phase (such as increased lifetimes and recycled contents in products). For a small number of product groups regulated under Ecodesign (welding equipment, servers and data storage products, and electronic displays), impact assessments have estimated specific environmental effects of Ecodesign provisions not related to use-phase energy consumption (see Polverini 2021). However, these results are too specific to be used in the much broader assessment of a general Ecodesign scope extension. Therefore, more general information on the potential environmental effects of measures not related to use-phase energy consumption was collected and is reported in Annex 4.

Under the assumption of maximum improvement potentials (see Annex 4), sub-option 2a would be able to provide considerable benefits in all environmental impact categories, ranging between 4 and 16%, depending on the impact category. Specifically, it would effectively double the reduction of GHG emissions in comparison with the current Ecodesign legislation. Due to the inclusion of the priority product groups of the Circular Economy Action Plan, considerable reductions are also possible in the case of other environmental impact categories.

Table 29 Maximum Improvement potential relative to BAU for scope 2a as a % of total EU impacts

| GHG emissions | Human toxicity | Particulate matter | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|---------------|----------------|--------------------|-------------------------------|---------------|----------------|-------------|----------|---------------------------|-----------------------------------|----------------------------|
| 6,8% | 15,8% | 16,5% | 9,3% | 6,4% | 6,8% | 15,1% | 8,5% | 4,2% | 10,0% | 6,8% |

⁸⁷ German Federal Statistical Office (2018). Statistics on small and medium-sized enterprises. https://www.destatis.de/EN/Themes/Economic-Sectors-Enterprises/Enterprises/Small-Sized-Enterprises-Medium-Sized-Enterprises/_node.html

3.3.3. Social impacts

The EIA Status Report 2019 reports one category of social impacts, i.e. the number of additional jobs in the industry, wholesale, retail and installation sectors which are directly linked to the estimated additional revenues of these sectors resulting from the Ecodesign legislation (see section on economic impacts). Similarly to above, the assumed mechanism leading to additional jobs holds for the regulation of energy-using products, but not necessarily for the products covered under the scope extension.

The studies cited above for economic effects also report social effects in the form of employment changes. The study by Cambridge Econometrics, Trinomics and ICF estimates employment effects of circular economy measures of approximately 0.3% additional demand for jobs in the EU, mainly driven by additional labour demand in the recycling sectors. Wiebe et al. (2019) find more pronounced positive employment effects for the EU, which average at about 4%. In contrast, Donati et al. (2020) estimate an employment reduction of approximately 8% for the EU as a whole.

3.4. Sub-option 2b: Extension beyond sub-option 2a to all physical goods

Under **sub-option 2b**, all physical products (except for agricultural and food products) would be included. This extension of scope would encompass products responsible for 22% of EU domestic demand, 21% of employment, 16% of EU GHG emissions, 42% of human toxicity and 18% of primary energy consumption. Including the baseline the total scope of 26% of European domestic final demand, 24% of employment, 65% of current GHG emissions, 64% of human toxicity emissions and 69% of primary energy consumption.

Table 30 Potential coverage of baseline and sub-option 2b product scope with respect to economic and environmental indicators; percentages represent shares of EU totals; source: own calculations based on EXIOBASE v.3.8.1 (see Annex 4 for details)

| Economic importance | | Environmental impacts | | | | | | | | | | |
|---------------------|---------------------------|--|-------------------------------|------------------------------------|--|------------------------------|-------------------------------|----------------------------|---------------------------------------|---|---|---------------------------------|
| Final demand [bn€] | Employment [1000 Persons] | GHG emissions [Mt CO ₂ e emissions] | Human toxicity [kt emissions] | Particulate matters [kt emissions] | Photochemical ozone formation [kt emissions] | Acidification [mt emissions] | Eutrophication [kt emissions] | Ecotoxicity [kt emissions] | Land use [thousands km ²] | Resource depletion, water [Mm ³ consumption] | Resource depletion, raw materials [Mt extraction] | Primary energy consumption [PJ] |
| 3,441 | 51,754 | 3,145 | 109 | 5,608 | 12,501 | 2,609 | 10,332 | 142 | 1,736 | 159,255 | 10,436 | 43,830 |
| 26% | 24% | 65% | 64% | 64% | 49% | 74% | 34% | 61% | 29% | 17% | 70% | 69% |

3.4.1. Economic impacts

3.4.1.1. Administrative burden

Administrative burden for economic operators

The administrative burden on economic actors will depend on the products effectively regulated and the stringency of product requirements. As outlined above, a rough estimate can be based on the number of products effectively regulated under the scope extension. For sub-option 2b, the extension to the remaining physical products would imply a little more than a doubling of the number of products groups covered in the baseline. The additional burden would thus sum to EUR 11 to 18 million per year compared to the baseline.

Administrative costs for the European Commission

The scope extension from 2a to 2b only involves a limited number of products that would presumably lead to horizontal regulations, rather than product-specific. It is fair to assume that an additional 2-3 regulations would be useful to cover the scope extension. Based on the assumed doubling of potential regulations under sub-option 2a, the additional number of regulations would therefore be around 30. Under the same assumptions of personnel requirements of approximately 0.75 FTE per product group, the additional FTEs compared to the baseline would then be roughly 28 FTEs.

At the same time, compared to the baseline, a total of EUR 11 million would be required for initial preparatory studies at a cost of EUR 350 000, which could be spread over a number of years, depending on the prioritization of needs. However, compared to sub-option 2a, this sub-option would present the added value of not having to revise the overarching legislative framework should action need to be taken for new or future product categories.

Administrative burden for Member States

The extension of the scope will increase the market surveillance needs for EU Member States by increasing the number of products to be looked at. Considering that EU Member States are required to guarantee that Market Surveillance Authorities have the necessary resources and knowledge to perform their functions, the scope extension under sub-option 2b will likely increase administrative costs for EU Member States. It can be estimated that the increase in costs is proportional to the increase in the number of products that will be effectively covered through SPI acts. However, some scale effects may be realised, leading to lower specific costs and thus a less than proportional increase.

3.4.1.2. Direct economic impact for businesses

The economic effects described above for sub-option 2a apply to a small range of high-impact product groups, which mostly overlap with the priority product groups in the CEAP. The addition of the remaining physical products in sub-option 2b would increase the market share of covered products by 13%. However, the overall economic effects likely remain in the same broad range cited above.

3.4.1.3. Indirect economic impact for businesses

Structural shifts are expected in the economy, resulting from less demand for traditional manufacturing and more for repair and related services, etc. The literature is inconclusive on the overall effect and these effects are difficult to quantify.

3.4.1.4. Economic impact for citizens

Similar to sub-option 2a, the net effects for citizens are difficult to quantify, since in the case of non-energy-using products, consumers will not experience savings through energy demand reductions. Instead, savings may materialise in the form of fewer purchases of new products (because products can be kept longer in use due to Ecodesign provisions). These demand reductions may be countered by increased demand for spare parts and repair services provided their prices are affordable.

3.4.2. *Environmental impacts*

The environmental impacts of sub-option 2b are very similar to those of sub-option 2a in all impact categories, ranging from 5 to 18%, depending on the impact category (see Table 31). However, the wide scope of sub-option 2b – which may in the future include novel products whose impacts remain as yet unknown – makes it impossible to accurately calculate its full coverage potential, which could be far higher than the above-mentioned figures. In terms of readying the EU to address possible future (as yet unknown) product sustainability challenges, and lessening the likelihood of problematic regulatory gaps occurring (as is now the case), this sub-option scores better in terms of efficiency and

it is more suitable than sub-option 2a due to being more future proof. There would also be additional positive impacts from developing horizontal measures applying to the products groups not covered in 2a. In practice, under this sub-option, following a prioritisation exercise, the first product groups tackled would likely be those identified under sub-option 2a (as not all products will be tackled at once, rather turned into a workplan over a number of years).

Table 31 Maximum improvement potential compared to BAU for scope 2b as a % of total EU impacts

| GHG emissions | Human toxicity | Particulate matter | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|---------------|----------------|--------------------|-------------------------------|---------------|----------------|-------------|----------|---------------------------|-----------------------------------|----------------------------|
| 7,4% | 16,8% | 17,6% | 10,1% | 6,9% | 7,4% | 16,0% | 9,8% | 4,8% | 10,6% | 7,6% |

3.4.3. Social impacts

The EIA Status Reports detail one category of social impacts, i.e. the number of additional jobs in the industry, wholesale, retail and installation sectors which are directly linked to the estimated additional revenues of these sectors resulting from the Ecodesign legislation (see section on economic impacts). Similarly to above, the assumed mechanism leading to additional jobs holds for the regulation of energy-using products, but not necessarily for the products covered under the scope extension.

The studies cited above for economic effects also report social effects in the form of employment changes. The study by Cambridge Econometrics, Trinomics and ICF estimates employment effects of circular economy measures of approximately 0.3% additional demand for jobs in the EU, mainly driven by additional labour demand in the recycling sectors. Wiebe et al. (2019) find more pronounced positive employment effects for the EU, which average at about 4%. In contrast, Donati et al. (2020) estimate an employment reduction of approximately 8% for the EU as a whole.

The scope extension beyond the priority product groups of the CEAP would increase the potential reach of Ecodesign to about 24% of European employment. However, the magnitude and direction of potential changes in employment are difficult to estimate. The studies cited above provide a possible range of the changes.

3.5. Sub-option 2c: Extension beyond sub-option 2b to all services

Under **sub-option 2c**, services would be added to the scope, which would lead to an additional 52% of European domestic final demand, 53% of employment and 10 to 32% of environmental impacts covered under Ecodesign.

Table 32 Potential coverage of sub-option 2c product/service scope including baseline with respect to economic and environmental indicators; percentages represent shares of EU totals; source: own calculations based on EXIOBASE v.3.8.1 (see Annex 4 for details)

| Economic importance | | Environmental impacts | | | | | | | | | | |
|---------------------|---------------------------|----------------------------------|-------------------------------|-----------------------------------|------------------------------------|------------------------------|-------------------------------|----------------------------|--------------------------|--|--|---------------------------------|
| Final demand [bn€] | Employment [1000 Persons] | GHG emissions [Mt CO2e emission] | Human toxicity [kt emissions] | Particulate matter [kt emissions] | Photochemical ozone formation [kt] | Acidification [mt emissions] | Eutrophication [kt emissions] | Ecotoxicity [kt emissions] | Land use [thousand skm2] | Resource depletion, water [Mm3 consumpt] | Resource depletion, raw materials [Mt] | Primary energy consumption [PJ] |

| | | | | | | | | | | | | |
|--------|---------|-------|-----|-------|----------------|-------|--------|-----|-------|---------|-----------------|--------|
| | | s] | | | emissions] | | | | | ion] | extraction] | |
| 10,257 | 163,800 | 3,999 | 150 | 7,595 | 20,531 | 3,173 | 17,410 | 203 | 2,546 | 265,032 | 11,871 | 55,681 |
| 78% | 77% | 83% | 88% | 87% | 81% | 90% | 57% | 88% | 42% | 28% | 80% | 88% |

3.5.1. Economic impacts

3.5.1.1. Administrative burden

Administrative burden for economic operators

The administrative burden for businesses of the scope extension to all services is difficult to estimate, as no precedents exist for estimating the cost of the regulation of services under Ecodesign legislation. It will have to be assessed when looking at service-specific measures.

Administrative costs for the European Commission

The administrative burden for the European Commission of the scope extension to all services is equally difficult to estimate, as no precedents exist for estimating the cost of the regulation of services under Ecodesign legislation in this regard either. In addition, due to the heterogeneity of services the total administrative effort cannot be estimated by scaling up product level estimates.

Administrative burden for Member States

The same conclusions as for the administrative costs for the European Commission apply.

3.5.1.2. Direct economic impact for businesses

The addition of all services under sub-option 2c would increase the share of European final demand covered by a factor of 2.3 relative to the baseline. However, similarly to sub-option 2b, the potential GDP effects are unlikely to increase by such a factor. The heterogeneity of services additionally complicates the quantification of potential effects.

SMEs may be disproportionately affected by the scope extension to services since the service sectors generally display relatively high shares of SMEs.⁸⁸

3.5.1.3. Indirect economic impact for businesses

Structural shifts are expected in the economy, involving less demand for traditional manufacturing and more for repair and related services, etc. The literature is inconclusive on the overall effect. As a result, these effects are difficult to quantify.

3.5.1.4. Economic impact for citizens

Similar to sub-options 2a and 2b, the net effects for citizens are difficult to quantify.

⁸⁸ German Federal Statistical Office (2018). Statistics on small and medium-sized enterprises. https://www.destatis.de/EN/Themes/Economic-Sectors-Enterprises/Enterprises/Small-Sized-Enterprises-Medium-Sized-Enterprises/_node.html

3.5.2. Environmental impacts

The marginal environmental improvement potential of sub-option 2c is higher than that of sub-option 2b, ranging from 7 to 22%, depending on the impact category. The inclusion of all services creates a large reduction potential since they partially display high environmental impacts through their supply chains.

Table 33 Maximum improvement potential compared to BAU for scope 2c as a % of total EU impacts

| GHG emissions | Human toxicity | Particulate matter | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|---------------|----------------|--------------------|-------------------------------|---------------|----------------|-------------|----------|---------------------------|-----------------------------------|----------------------------|
| 10,9% | 21,5% | 22,1% | 16,4% | 10,1% | 12,0% | 21,3% | 12,5% | 7,0% | 12,5% | 11,3% |

3.5.3. Social impacts

The scope extension to all services would dramatically increase employment potentially addressed by the measures as the majority of economic sectors would be included in the scope. However, the employment effects are unlikely to increase by such a factor and will probably remain in the range of -8% to +4%.

3.6. Impacts on third countries:

The expansion of the product scope of the Ecodesign legislation will have a direct impact on importers of the affected product groups, since the latter will have to comply with the provisions of the Ecodesign legislation, involving administrative costs for compliance. For the products coming into the scope under sub-option 2a (textiles, furniture, high-impact intermediates and chemicals), the average share of imported goods is 19% of European final demand and 15% of intermediate demand. These shares are lower than for energy-related products under the current Ecodesign regulation (24% of final demand and 21% of intermediate demand). The relative effect on third countries is therefore more limited for the additionally regulated product groups than for those currently under regulation. For the remaining physical products to be included under sub-option 2b, 14% of both intermediate and final demand is sourced from international suppliers. Finally, for services to be included under sub-option 2c only 9% of intermediate demand and 8% of final demand is supplied from outside Europe.⁸⁹

Third countries will also be impacted by the reductions in environmental burdens induced by a wider product scope. Of the currently regulated products, approximately 45% of the environmental impacts are embodied in imported goods. While for the additional products covered under sub-option 2a the share of environmental impacts embodied in imports drops somewhat, it still amounts to 33%. For the remaining physical products covered under sub-option 2b, about 28% of the environmental impacts are embodied in imports; for services covered under sub-option 2c, this value drops to 12%. Therefore, though this effect is reduced in relative terms moving from sub-option 2a to sub-option 2c, considerable reductions in environmental impacts can be achieved outside the European Union through the scope extension.

⁸⁹ Own calculations with EXIOBASE v.3.8.1.

3.7. Summary of impacts

Table 34 Administrative burden of PO2

| <i>Administrative burden Option 2</i> | | | | | |
|---------------------------------------|----------------|------------|--|--|---|
| | | Businesses | | Administrations | |
| | | One-off | Recurrent | One-off | Recurrent |
| Sub-option 2a | Direct costs | none | EUR 10 to 16 million per year | Preparatory studies: 10M€ | 25 FTEs |
| | Indirect costs | none | n.a. | none | n.a. |
| Sub-option 2b | Direct costs | none | EUR 11 to 18 million per year | Preparatory studies: 11M€ | 28 FTEs |
| | Indirect costs | none | n.a. | none | n.a. |
| Sub-option 2c | Direct costs | none | Additional expenses for ensuring compliance of services. | additional expenses for preparatory studies on top of 2b | Additional expenses for regulation of services. |
| | Indirect costs | none | n.a. | none | n.a. |

Table 35 Economic impacts of PO2

| <i>Economic impacts</i> | | | | |
|--|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 2a</i> | <i>Option 2b</i> | <i>Option 2c</i> | |
| <i>Direct impacts</i> | | | | |
| Additional costs for the EU and MS administrations as well as businesses | - | - | -- | Scope extension to more products leads to cost increases for all involved stakeholders. |

| | | | | |
|-------------------------------------|-----|-----|-----|--|
| | | | | |
| Impacts on businesses | +/- | +/- | +/- | Businesses may be negatively affected by demand reductions (e.g., due to longer lasting products or price increases) and positively affected by increased demand for repair and related services or higher demand for EU products, which would more easily comply with requirements. The literature is inconclusive on the overall effect. |
| Impacts on consumers | +/- | +/- | +/- | Consumers may benefit from prolonged functionality of products and reduced demand for new products, while they may be burdened by additional expenses for products, and repair and related services. The literature is inconclusive on the overall effect. |
| Indirect impacts | | | | |
| Indirect effects on overall economy | +/- | +/- | +/- | Structural shifts are expected in the economy, involving less demand for traditional manufacturing and more for repair and related services, etc. The literature is inconclusive on the overall effect. |

Table 36 Environmental impacts of PO2

| Environmental impacts | | | | |
|--------------------------------------|---------------------------|------------------|------------------|--|
| Description | Amount/qualitative | | | Comments |
| | Option 2a | Option 2b | Option 2c | |
| Direct impacts | | | | |
| Overall environmental effects | ++ | ++ | +++ | Overall, considerable positive environmental impacts are expected from the sub-options in comparison with BAU (exemplary reduction potentials listed below). |
| Reduction potential of GHG emissions | 7% | 7% | 11% | Increased scope leads to an increasing GHG reduction potential for sub-options 2a to 2c, though difference between 2a and 2b is negligible. |

| | | | | |
|---|-----|-----|-----|--|
| Reduction potential of human toxicity | 16% | 17% | 22% | Increased scope leads to an increasing human toxicity reduction potential for sub-options 2a to 2c, though difference between 2a and 2b is negligible. |
| Reduction potential of resource depletion (raw materials) | 10% | 11% | 13% | Increased scope leads to an increasing resource depletion reduction potential for sub-options 2a to 2c, though difference between 2a and 2b is negligible. |

Table 37 Social impacts of PO2

| <i>(I) Social impacts</i> | | | | |
|---------------------------------|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 2a</i> | <i>Option 2b</i> | <i>Option 2c</i> | |
| <i>Direct impacts</i> | | | | |
| Overall effect on EU employment | +/- | +/- | +/- | Effects on employment are expected to follow overall economic effects. While manufacturing industries may experience slight employment decreases due to reduced product demand, repair and related services may experience slight increases. The literature is inconclusive on the net effects on employment. |
| <i>Indirect impacts</i> | | | | |
| n.a. | | | | |

4. OPTION 3: EXTENSION OF SUSTAINABILITY REQUIREMENTS FOR PRODUCTS

4.1. Overview

Overview of Policy Option 3

Sub-option 3a: Enhanced sustainability requirements

- Measure 3a.1 – Minimum requirement on the durability or reliability of the product or its components
- Measure 3a.2 – Minimum requirements on reparability and upgradability
- Measure 3a.3 – Restricting the presence of substances hindering circularity
- Measure 3a.4 – Minimum requirements on recycled content on the product or components
- Measure 3a.5 – Minimum requirements to reduce carbon and environmental footprints set at process and/or life cycle environmental impact(s) level
- Measure 3a.6 – Requirements enabling high-quality recycling

Sub-option 3b: Far-reaching sustainability requirements

- Measure 3b.1 – Adoption of SPI measures setting out requirements covering large groups of products
- Measure 3b.2 – Minimum requirements on re-manufacturability
- Measure 3b.3 – Requirements of due diligence on the supply chain of products

Sub-option 3c: Bans on some products

4.1.1. Assumptions used in the analysis

- The main levers for the environmental, social and economic effects are the scope of the requirements and their stringency.
- It is assumed that the requirements of these sub-options will vary across sectors and specific adaptation will be required in implementing measures to integrate the different SPI measures.

4.1.2. What problems and specific objective(s) does this option address

This option addresses sub-problems 1 and 2, i.e. the fact that (i) product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects; and (ii) it is too difficult for economic operators and consumers to make sustainable choices in relation to products. By imposing requirements on the sustainability of products, this option will influence the design of products and eliminate the less sustainable ones from the EU market, hence facilitating the choice of economic operators and consumers.

The option will target specific objective 1 on improving product sustainability. While sub-option 3a will introduce minimum requirements for specific product groups, sub-option 3b will create the possibility to set requirements for large groups of products sharing common characteristics as well as requirements on social aspects. Both sub-options 3a and 3b will introduce or revise product requirements through SPI measures, following the preparation and adoption process provided in the legislation. Sub-option 3c establishes the possibility to ban certain products or materials in products.

Stakeholders' views on PO3

Several questions were asked in the OPC inviting stakeholders to provide an indication of their views on aspects relating to some of the measures under PO3. The most significant part of respondents were industry representatives (56%), while EU citizens represented 16% of total respondents, and NGO's and environmental organisations together 10%. Therefore, the share of stakeholder groups representability needs to be taken into account.

About 55% of the respondents agreed or strongly agreed that voluntary approaches such as labelling do not provide sufficient incentives for businesses to provide more sustainable products – even though the views of sectors diverged somewhat (84% of EU citizens, 38% of industry⁹⁰ representatives, 58% of NGOs and 91% of environmental organisations). SME views on voluntary approaches align with the average. There was **overall support (59%) for establishing binding rules on actions to be taken by producers to improve durability, re-usability, upgradability and reparability** to improve the situation compared to the baseline, though some sectors' views diverged (40% of the industry ranked this measure as important or very important, while 87% of EU citizens, 88% of NGOs and 91% of environmental organisations did so). SMEs

⁹⁰ Business associations and companies

are slightly less supportive of binding rules (56%, n=59), though still a majority of this group is in favour. In addition, overall 58% of respondents agreed or strongly agreed that economic actors do not have adequate and reliable information on the sustainability of products (56% of EU citizens, 54% of industry representatives, 78% of NGOs and 81% of environmental organisations). This view is slightly higher amongst SMEs (69%, n=59).

On the question on product design rules and general product requirements to foster overall sustainability of products in the EU as set out in the CEAP, the following four options received the highest scores, i.e. between 32% and 35% of the highest score and 18% to 24% of the second highest (4 out of 5): setting binding rules for durability, usability, etc.; prioritising modular designs to facilitate easy repair, upgrade, remanufacture, etc.; producers ensuring information on reparability; and ban on substances inhibiting circularity - even though within certain sectors views diverged on these issues. Out of these, the option which received the highest percentage of the highest preference score was 'Set[ting] binding rules detailing, at product group level, what actions producers are obliged to take to improve their products' durability, reusability, upgradability and reparability'. The views of certain sectors diverged with 88% of EU citizens, 88% of NGOs and 91% of governmental organisations showing very high or high preference, while only 40% of industry representatives shared this preference.

In targeted interviews (see Annex 2), minimum sustainability requirements on products (e.g., included in a revision of current Ecodesign rules) were considered by some interviewees – in particular NGOs and consumer associations – as the most effective means of reducing products' environmental impact, because not enough consumers are ready to pay more for sustainability. Nonetheless, some industry representatives expressed concerns about the costs involved in testing certain requirements (e.g., product lifespan requirements and product environmental footprint requirements – in particular if the SPI measure specifies that PEF studies should be used) and how difficult it might be to comply with certain requirements (e.g., on recycled content). Part of the industry was also concerned about potential increases in the administrative burden (e.g., because of due diligence requirements). In general, however, **corporate interviewees supported a product-specific approach to the requirements placed by the SPI and expressed readiness to comply with additional requirements**, provided these are grounded in a robust Impact Assessment and the verification of compliance relies on high quality testing standards. SMEs, however, said they may find it challenging to test the durability of products. Requirements already foreseen in the existing Ecodesign directive are expected to elicit the most effort from manufacturers, though these are expected to provide the highest benefit (via NGOs) and have a large impact on reducing the environmental/social impact of products (via academic/research institutions).

At a workshop with 73 MS representatives in relation to sustainability requirements for products (PO 3), general support was expressed for requirements on durability and reparability, and a number of participants underlined the importance of requirements on recycled content as well as high-quality recycling. In addition, general support was expressed for the use of the PEF method, even though some advised that setting minimum requirements on the carbon/environmental footprint for products might be complex and require additional time. Participants were supportive of the idea of having a set of sustainability principles applicable to all products, but advised that a product-specific approach will also be needed to complement and implement these in concrete terms. In general, participants were also supportive of including due diligence requirements within the SPI, underlining that coherence with other initiatives in this area (such as the upcoming Sustainable Corporate Governance initiative) should be ensured.

The qualitative feedback from interviews with representatives of some industrial sectors on the potential impact of some measures under PO3 is presented below:

Home Appliances

- **Minimum requirement on durability:** durability is already tested. Additional requirements on “less relevant” parts would mean a significant increase in the costs for testing and will lead to investments for testing equipment, adaptation of production technology and an increase in the number of staff for testing.
- **Minimum requirements on reparability and upgradability:** requirements based on current provisions for white goods will lead to (i) an increase in the costs, as testing capacities will have to be increased; (ii) investments in test equipment and space; (iii) adaptation of production technology; and (iv) an increase in the number of staff for design, testing, quality management, etc.
- **Minimum requirements on recycled content:** similar requirements will lead to an increase in costs. The workload to manage the paperwork relating to the supply chain, and check and audit

suppliers will increase significantly. In addition, using a substantial amount of recyclates in manufacturing will require adaptation of the manufacturing processes and potentially new machines. The administrative burden will increase as well as personnel costs. Moreover, a significant increase is expected in the costs to check recyclates for substances. A management system will need to be set up and additional investments will be needed to adapt the composition of the material used (mixed vs. virgin). Finally, an increased quality and verification management market for high quality recycled plastics is not yet developed and additional verification costs for incoming secondary raw materials are expected.

- **Minimum requirements to reduce the carbon and environmental footprints:** having requirements on footprints in addition to the existing Ecodesign requirements will lead to an increase in costs. PEF is (currently) not robust enough to assess product footprints adequately. As a result, a huge effort will need to be made by companies to calculate the PEF of their products, let alone reduce it. Extensive LCAs will have to be performed for each type of product, requiring testing staff, designers, supply chain experts, etc. Finally, IT systems will need to be modified, (LCA) software purchased, etc.
- **Requirements of due diligence on the supply chain of products:** documentation and reporting will increase the administrative burden. Company-wide implementation requires significant initial investments in training, tools and consultancy, as a chain of custody will have to be installed, requiring in turn a management system, extensive quality management and testing, and modification of IT systems. In the long-term, small- and medium-sized suppliers face significant costs to “co-comply” with due diligence laws by documenting and reporting the information needed by their clients. This kind of “paperwork” burdens long-lasting and trusted customer-supplier relationships.
- **Minimum requirements on re-manufacturability:** a new approval of each remanufactured model will be required.
- **Measures banning some products or some materials in specific products:** in order to ensure business continuity investments will be required and more staff will be needed for testing, quality management, warehouse management, marketing, variant management, communication efforts, warehouse management, etc.

Textiles

- **Minimum requirements to reduce the carbon and environmental footprints:** if a specific reduction is introduced, e.g. 5%, then the measure would work, but if a target like zero carbon in 10 years is set, then the costs will be huge.
- If the threshold for product quality is too high, then cheaper products will have their price increased.
- **Minimum requirements on reparability and upgradability:** a flat cost per product would entail a marginal increase; for larger reparability programmes the increase would be negligible.
- **Minimum requirements on recycled content:** for the textile industry, the price of, e.g., polyester could be high in the short term, but in the long term prices will stabilise (as the supply of recycling material adapts).
- **Minimum requirement on durability:** a trade-off exists between durability and recyclability.
- **Minimum requirements on re-manufacturability:** re-manufacturing is not applicable to the textile industry.
- **Requirements enabling high-quality recycling** depend on the components (fibres, chemicals) and how far you can go, for example a ski jacket.
- **Requirements of due diligence on the supply chain of products:** obtaining reliable data (where does the cotton/wool come from) is very difficult. The tracing system does not exist and would entail very high costs.

4.2. Baseline for PO3

Currently, sustainability requirements for products are only partially addressed at EU level, via several product or sector-specific EU legislative instruments (such as the Ecodesign Directive, the Packaging and Packaging Waste Directive, the Single Use Plastics Directive, the End of Life of

Vehicles Directive, the Waste from Electrical and Electronic Equipment Directive, the Construction Products Regulation, and the Batteries and Waste Batteries Regulation) – some of which are currently undergoing revisions⁹¹. While it is expected that most of the instruments due for revision will increase the requirements in relation to product sustainability, given that no firm decisions on the preferred options for some initiatives have been made yet, forecasting with accuracy the changes to the baseline that these may give rise to is not possible. Taking this into account, **the baseline for the assessment of this PO will rely on existing legislative provisions** (whether already in force or proposed by the Commission).

In relation to the Ecodesign Directive, in the baseline scenario the current status quo is maintained and no additional, more ambitious sustainability requirements are expected to be integrated. Marginal progress and a positive impact might still come from the extension of the circularity requirements that the Directive establishes for limited product groups to other product groups, including those still to be added in the 2030 horizon (see baseline for PO2).

While, as mentioned above, predicting the impact of the evolution of other legislative acts is difficult, some forecasts can be made with regard to the Single Use Plastics (SUP) Directive, the Batteries Regulation, and the upcoming initiatives on empowering consumers and on green claims:

- The **SUP Directive**⁹², based on its provisions and the 2021 guidance, will promote *reusability, recyclability, uptake of recycled material and design for circularity* for single use plastic products, and will limit the *presence of hazardous chemical substances* in single use plastics. It will also progress in delivering *targets for recycled content in beverage bottles*: 25% by 2025 for PET bottles and 30% for all beverage bottles by 2030. A collection target for beverage bottles of 90% by 2029 was also established. Finally, the Directive will ensure that at least a quarter of the fishing gears (or 2700 tons/year) will not be abandoned by fishermen⁹³.
- The new **Batteries and Waste Batteries Regulation** is expected to address the *hazardous aspects* of batteries and waste batteries, and promote targets for *recycled content* in industrial, EV and automotive batteries (in 2030: 12% cobalt, 85% lead, 4% lithium and 4% nickel; and in 2035: 20% cobalt, 85% lead, 10% lithium and 12% nickel). As it will also introduce *progressive requirements to minimise the carbon footprint* over the life cycle of batteries, efforts to decrease the carbon footprint in the manufacturing process will indirectly lead to the promotion of renewable energy generation as well. Finally, EU aims to get at least 30 million zero-emission vehicles on EU roads by 2030⁹⁴ stimulating the market for 2nd life batteries with a 25% uptake would annually save 400 000 tons of CO₂ in 2035, generate around EUR 200 million in added-value in 2030 and create around 2 000 FTE jobs⁹⁵.
- The upcoming **initiatives on empowering consumers and on green claims** will reduce the amount of false claims and support the market for products that proved their sustainability in accordance with the environmental footprint methods. The benefits associated with transparency will help create the right market signals for products. In addition, the Circular Electronics Initiative, and the Right to Repair Initiative, is expected to promote reparability of products in the group of electronics, which will help to reduce waste.

⁹¹ See Annex 14 for further details

⁹² Directive (EU) 2019/904

⁹³ SWD/2018/254 final. IMPACT ASSESSMENT Reducing Marine Litter: action on single use plastics and fishing gear [EUR-Lex - 52018SC0254 - EN - EUR-Lex \(europa.eu\)](#)

⁹⁴ https://ec.europa.eu/commission/commissioners/2019-2024/valean/announcements/keynote-speech-eurelectrics-electro-mobility-summit_en.

⁹⁵ SWD/2020/335 final. IMPACT ASSESSMENT REPORT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) 2019/1020

Finally, responsible sourcing and due diligence are growing in importance throughout the raw materials value chain and have the potential to drive positive changes in local communities that extract raw materials, for example in the case of cobalt in the Democratic Republic of the Congo (DRC)⁹⁶. The EU Regulation on Conflict Minerals⁹⁷, covering tin, gold and a couple of CRMs such as tantalum and tungsten, applies to EU importers as of 1 January 2021 and addresses such concerns. The European Partnership on Responsible Minerals⁹⁸ helps mines to comply with the EU Regulation and OECD due diligence guidance⁹⁹. Article 39 of the proposal for a Batteries Regulation¹⁰⁰ intends addressing actual and potential social and environmental risks linked to the sourcing, processing and trading of the raw materials required for battery manufacturing. To that end, the proposal for a Batteries Regulation prescribes that battery manufacturers shall comply with supply chain due diligence obligations (including adopting and clearly communicating to suppliers and the public a company policy for the supply chain of raw materials; establishing and operating a system of controls and transparency over the supply chain, including a chain of custody or traceability; and identifying and assessing potential adverse impacts associated with the identified list of social and environmental risk categories). Responsible sourcing aspects could in principle be analysed in the Ecodesign preparatory studies, after adjustments of the Methodology for Ecodesign of Energy-related Products (MEErP)¹⁰¹.

However, existing or anticipated sustainability requirements under the above-mentioned legislative instruments remain product or sector-specific, meaning that, in the absence of SPI, **no overarching framework to address product sustainability requirements will be in place by 2030**. The various product or sector-specific legislations may in addition adopt different approaches and/or methodologies, or be more or less ambitious in their requirements. As a result, the overall criteria and sustainability levels targeted by the SPI are unlikely to be evenly achieved across products or sectors.

In addition, gaps in the product coverage are likely to be inevitable: for example, some products, such as textiles, furniture and chemicals, are not covered by the current or anticipated product legislation and, in the absence of SPI, are unlikely to be subject to product-level sustainability requirements over the coming years.

All in all, a “no SPI” scenario is likely to result in **missed opportunities** in terms of product-level sustainability requirements for various groups of products, for example:

- In Europe alone, around 5.8 million tons of **textiles** are thrown away every year. In addition, less than 1% of the material used to produce clothing is recycled into new clothing, representing a loss of more than EUR 92 billion worth of materials each year¹⁰². Finally, the textile consumption is responsible for about 10% of world CO₂ emissions and 20% of global water consumption, and in a ‘no action scenario’ by 2050 it will use up to a quarter of the world’s carbon budget.¹⁰³
- 10.8 million tonnes of furniture are discarded by businesses and consumers in the EU each year and 80-90% goes to landfill, with 10% recycled¹⁰⁴.

⁹⁶ Mancini, L., Eslava, N., Traverso, M., Mathieux, F., Assessing impacts of responsible sourcing initiatives for cobalt: Insights from a case study, Resources Policy 71 (2021) 102015, <https://doi.org/10.1016/j.resourpol.2021.102015>

⁹⁷ Regulation (EU) 2017/821

⁹⁸ <https://europeanpartnership-responsibleminerals.eu/>

⁹⁹ <https://www.oecd.org/daf/inv/mne/OECD-Due-Diligence-Guidance-Minerals-Edition3.pdf>

¹⁰⁰ https://ec.europa.eu/environment/topics/waste-and-recycling/batteries-and-accumulators_en

¹⁰¹ Mancini, L., Blengini, G.A., Ardenne, F., Mathieux, F. JRC notes on Responsible Sourcing in MEErP. (2021). (draft – unpublished)

¹⁰² EEA (2019) Textiles and the environment in a circular economy, Eionet Report - ETC/WMGE 2019/6

¹⁰³ UNEP: [Putting the brakes on fast fashion \(unep.org\)](https://www.unep.org/news-and-stories/story/putting-the-brakes-on-fast-fashion)

¹⁰⁴ Eunomia and EEB (2019) Circular Economy opportunities in the furniture sector [Report-on-the-Circular-Economy-in-the-Furniture-Sector.pdf \(kinstaedn.com\)](https://www.eunomia.com/wp-content/uploads/2019/06/Report-on-the-Circular-Economy-in-the-Furniture-Sector.pdf)

- Some 60% (by weight) of the chemicals that are circulating on the European market, including basic chemicals like oxygen or hydrogen, and are needed to produce other chemicals and household products, from detergents and disinfectants to vinegar, have been identified as hazardous for human health and the environment¹⁰⁵.

4.3. Sub-option 3a: Enhanced sustainability requirements

4.3.1. Economic impacts

The first stakeholders to be affected are economic actors across the value chain (including in third countries), as obligations will be introduced for them to fulfil minimum requirements for the products they wish to place on the market, including obligations such as due diligence processes. Several economic operators downstream, such as repairers, re-furbishers, re-manufacturers, recyclers and sellers of second-hand products, will benefit from the reinforced circularity requirements included in this sub-option. Workers along the supply chains will also be affected, as they will have to adapt to the changes in product design and may need to become acquainted with new skills. On the other hand, they will benefit from a reinforced attention to social aspects along the supply chain. Product users (consumers as well as professional purchasers and users) will benefit from better quality products, and ease of reparability and upgradability. Finally, market surveillance and customs authorities will be affected too, as they are the main stakeholders responsible for enforcing the change in the EU internal market.

4.3.1.1. Administrative burden

Administrative burden for economic operators

Additional administrative burdens can be expected from this sub-option, for example for the provision of information for market surveillance. Companies will be also required to collect more information from their upstream suppliers, e.g. on the presence of substances of concern in the components or mixtures they are supplied with. Assessing the exact administrative burden on economic operators is difficult, but it can be expected to increase from sub-option 3a (the lowest) to sub-option 3b (the highest). However, the possible introduction of a Digital Product Passport – if chosen under PO 4 – is likely to ease this burden.

Administrative costs for the European Commission

Under sub-option 3a, the European Commission will have to conduct a significant amount of work for developing minimum requirements for different measures (e.g., via SPI measures). The average duration from an Ecodesign preparatory study to the implementing measure is 42 months and extensive resources are required¹⁰⁶.

Administrative burden for Member States

The administrative burden on public authorities will be related to the compliance with and enforcement of these measures. In particular, for MSs the new requirements under this sub-option will require additional costs for market surveillance, e.g. for training about the new measures and specifications the product, components and material will have to comply with, as well as for the additional human resources needed to conduct market surveillance activities effectively. As mentioned above, however, the possible introduction of a Digital Product Passport – if chosen under Option 4 – is likely to facilitate these tasks.

¹⁰⁵ Packaging Europe: [Into the crucible: Will the European chemicals industry rise to the circularity challenge?](#) - Packaging Europe

¹⁰⁶ Hinchliffe (2018) Assessing the Review Process of EU Ecodesign Regulations. Presentation made at the seminar “The role of the Ecodesign Directive in reaching climate and resource efficiency objectives in Europe”

Importantly, if the implementation of a measure on minimum requirements to reduce the carbon and environmental footprints requires the provision of an Ecological Profile in the form of a PEF study, this will likely be accompanied by third party compliance assessment requirements, which would facilitate the work of verification and enforcement of this measure by Market Surveillance Authorities.

4.3.1.2. Direct economic impact for businesses

Compliance costs for manufacturers and their suppliers:

Most of the measures will put in place new constraints resulting in an increase in compliance costs, e.g. for secondary raw material, product design, and post first-use (ease of repair or reuse) and end of life (improved recycling, remanufacturing) procedures. Companies would need to adapt their product design and even production line with possible negative economic impacts. From the estimates provided by industry representatives in targeted interviews (see Table 71 in Annex 11), it can be inferred that, in most cases, the increase in costs is likely to remain below 5% of current compliance costs.

Depending on the business model, the risk is that businesses pass on the increased price component to consumers, with the initial purchase price of products increasing. The presence on the market of more durable and reliable products, however, is expected to result in a reduction in the overall number of products to be manufactured per year (in particular, probably, for products for which consumers show a strong willingness to pay for improved reparability and durability). In some cases, an initial price increase may be followed by price stabilisation, e.g. as the supply of recycled/secondary material grows to meet demand and the new requirements become the norm in the value chain. The requirements under sub-option 3a are also likely to support businesses in developing new revenue streams and avenues of business, such as repair, refurbishing and remanufacturing¹⁰⁷. Finally, the sub-options on incentives (PO5) are also likely to support the demand for sustainable products.

Functioning of the internal market: Most of the measures under this sub-option will help in establishing level playing fields, given that some MSs have such requirements in place already (e.g., France¹⁰⁸, Germany¹⁰⁹ and Sweden¹¹⁰), resulting in uneven requirements for businesses to comply with for the same products.

Competitiveness, trade and investment flows: The proposed measures could improve the competitiveness of all companies placing products on the EU market, as all businesses will be subjected to the same minimum requirements. The same benefits have already been provided by the Ecodesign Directive¹¹¹. Increased reuse, longer lifetimes, reparability, availability of high-quality recycled material, etc. will help to increase the stock life and the availability of secondary raw material of high quality, also reducing the import dependency of the EU. In the long run, businesses will benefit from eco-designed products¹¹².

¹⁰⁷ For instance, some retailers in France (Darty and FNAC) have started investing in the repair sector to generate additional revenue

¹⁰⁸ French law against waste and for a circular economy <https://www.ecologie.gouv.fr/loi-anti-gaspillage>

¹⁰⁹ Circular Economy Act 2020 <https://www.bmu.de/en/law/circular-economy-and-safeguard-the-environmentally-compatible-management-of-waste/>

¹¹⁰ Swedish strategy for circular economy accelerates the transition to sustainability 2020 <https://www.government.se/4ad42c/contentassets/d5ab250cf59a47b38feb8239eca1f6ab/circular-economy--strategy-for-the-transition-in-sweden>

¹¹¹ “The circular economy requirements embodied in the Ecodesign Regulations are typically identified as the most effective solutions – in regulatory terms – to ‘market failures’, i.e., observed deviations from perfectly competitive market behaviour” in Bukarica and Tomšič (2017) Energy efficiency policy evaluation by moving from techno-economic towards whole society perspective on energy efficiency market. Ren. and Sust. Energy Rev.

¹¹² ADEME (2017) Analyse des bénéfices économiques et financiers de l'éco-conception pour les entreprises. This study, covering 10 companies from five different sectors (food, IT, sport, building, pharmaceutical and hitech), estimated several economic and financial returns generated by the implementation of eco-design approaches in companies: (i) a significant increase in turnover (up to a factor of 5

Impact on SMEs:

For some sectors (for example electrical and electronic products), companies placing products on the EU market have the opportunity to further develop and capture the repair and refurbishment market, where significant growth has been seen recently¹¹³. As most of the companies in these markets are SMEs, this could produce a significant positive economic impact for the sector.

Importantly, if the implementation of a measure on minimum requirements to reduce the carbon and environmental footprints requires the provision of an Ecological Profile in the form of a PEF study, this will imply an additional administrative burden for the preparation and verification of the PEF study. As noted by some industry and MS representatives, the additional cost may be significant for SMEs. Under the Green Claims initiative, however, the Commission is considering possible measures to facilitate the preparation of PEF studies by SMEs, such as the availability of simplified calculation tools, access to low-cost expertise and support through existing funding and financing tools.

4.3.1.3. Indirect economic impact for businesses

As with Ecodesign and Energy Labelling legislation¹¹⁴, the measures under this sub-option are expected to have a positive impact on the deployment and diffusion of innovations. For Ecodesign, the level of ambition of the requirements plays an important role in stimulating innovation, and a positive impact on innovation and research can therefore be expected.

4.3.1.4. Economic impact for citizens

Consumers will benefit from the lower price of refurbished products and easy reparability options, but the initial cost of new products could become higher – even though in some cases the increase may be followed by price stabilisation, for the reasons explained above (see ‘Direct economic impact for businesses’) and because of the likely increased competition to provide more sustainable products. A study by the Parliament on the longer lifetime of products¹¹⁵ concluded that an increase of 1% of the use of the maintenance, repair and rental services, and other related sectors has an aggregated economic effect of EUR 6.3 billion.

4.3.2. Environmental impacts

The introduction and deployment of the measures under sub-option 3a would effectively reduce environmental impacts compared to the baseline scenario. The product groups recently regulated under the Ecodesign Directive (welding equipment, servers and data storage products, and electronic displays) already show the real environmental benefits deriving from material savings¹¹⁶. Therefore, net environmental benefits could be expected from both 3a1 and 3a2.

In the case of 3a1, products with a longer lifespan are^{117,118} expected to contribute to a reduction of resource depletion, waste, emissions, and other environmental impacts associated with the production,

for the most marked case, with median values ranging between +7 and 18%); a tangible reduction in production costs (up to -20% in the most pronounced case); and the strengthening of the commitment of employees and the improvement of the internal functioning of the company. <https://www.ademe.fr/analyse-benefices-economiques-financiers-leco-conception-entreprises>

¹¹³ In the case of smartphones, for instance, while the market for new phones is saturated, the market for refurbished phones is showing strong growth https://www.lemonde.fr/economie/article/2019/02/24/smartphones-le-boom-de-l-occasion_5427668_3234.html

¹¹⁴ https://ec.europa.eu/energy/sites/ener/files/documents/201405_ieel_product_innovation.pdf

¹¹⁵ European Parliament (2016) A Longer Lifetime for Products: Benefits for Consumers and Companies. [https://www.europarl.europa.eu/RegData/etudes/STUD/2016/579000/IPOL_STU\(2016\)579000_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2016/579000/IPOL_STU(2016)579000_EN.pdf).

¹¹⁶ Polverini (2021)

¹¹⁷ Iraldo et al. (2017) Is product durability better for environment and for economic efficiency? A comparative assessment applying LCA and LCC to two energy-intensive products. *Journal of Cleaner Production*; Ardente and Mathieux (2014) Environmental assessment of the durability of energy-using products: method and application. *Journal of cleaner production*; and Reale et al. (2019) Consumer Footprint-Basket of Products indicator on Household appliances. Technical report. European Commission, Joint Research Centre. 2019.

¹¹⁸ The results of a JRC study showed that “for the global warming potential, prolonging the lifetime of a washing machine and dishwasher is environmentally beneficial when the potential replacement product has up to 15 % less energy consumption during the use. For the

distribution and disposal life-cycle stages^{119,120,121,122,123}. For example, a German Environment Agency study¹²⁴ concluded that, for all product groups examined, long-life products do better than short-life variants in all environmental categories. Similarly, the PROMPT project showed that, among all the appliances analysed, those with shorter lives always perform worse for all environmental indicators¹²⁵. Moreover, according to Defra¹²⁶ there is an argument in particular for optimised lifetime extension strategies, especially for products in which manufacturing, supply chain and waste management impacts dominate over the life cycle. Finally, according to a European Environmental Bureau (EEB) study (2019), extending the lifespan of all washing machines, smartphones, laptops and vacuum cleaners in the EU by one year would lead to annual savings of around 4 million tonnes of CO₂ by 2030. In addition, this can promote the reuse of goods by providing more certainty regarding the remaining lifespan after first use (see below).

Generally, other indirect positive environmental impacts will materialise because products, having a longer lifetime, will be less frequently replaced; avoiding early failure of products prevents their early replacement, and therefore reduces environmental impacts related to the production, transport and disposal of products. The potential for circularity (i.e., re-sale and reuse)¹²⁷ is also increased by measures under this sub-option.

While assessing environmental impacts, a distinction needs to be made between B2B and B2C products, as the range of benefits will vary. For B2B products, foreseeing implementation is much easier, as an economic argument exists (having durable and reliable components/products reduces manufacturing and operational risks). Differently, in the case of B2C products consumer behaviour is a significant factor: the minimum requirements will bring in environmental benefits by gradually reducing the possibility for a consumer to choose an unsustainable product. Combined with incentives (PO5), this would further help to move towards more sustainable consumption models.

More in detail with regard to the other measures, measure 3a3 will support PO6 by facilitating circularity and thus contribute to environmental benefits; 3a4 will increase the demand for secondary raw material and thus environmental benefits associated with the reduction in primary resource consumption; 3a6 will foster recycling, thereby feeding the supply required under 3a4; and 3a5 and 3a6 will by design explicitly result in the reduction of negative environmental impacts. Overall, thus, the environmental benefits of sub-option 3a would be significant.¹²⁸

4.3.3. Social impacts

With more sustainable products and lower production needs, a shift in employment can be expected from the manufacturing sectors to the repair and refurbishing sectors. An increase in jobs in the

abiotic depletion potential impact, mainly influenced by the use of materials during the production phase, prolonging the lifetime of both machines was shown always to be beneficial, regardless of the energy efficiency of newer products. Freshwater eutrophication showed a great influence by the impact of the detergent used during the use phase; thus, prolonging the device's lifetime is still beneficial for this impact category, although the benefits are negligible compared to the life cycle impacts of the products.”. See <https://op.europa.eu/en/publication-detail/-/publication/72cd56e4-bab7-11e6-9e3c-01aa75ed71a1/language-en/format-PDF/source-126402524>

¹¹⁹ Estevan et al. (2017) Life Cycle Costing State of the art report. Local Governments for Sustainability, European Secretariat

¹²⁰ Bakker et al. (2014) Products that go round: Exploring product life extension through design. J Clean Prod

¹²¹ Bakker et al. (2019) Products that Last 2.0: Product Design for Circular Business Models. BIS Publishers

¹²² Cooper (2016) Longer lasting products: Alternatives to the throwaway society. CRC Press

¹²³ Ruth et al. (2005) Design Strategies to Postpone Consumers' Product Replacement: The Value of a Strong Person-Product Relationship, The Design Journal

¹²⁴ Prakash et al. (2016) Einfluss der Nutzungsdauer von Produkten auf ihre Umweltwirkung: Schaffung einer Informationsgrundlage und Entwicklung von Strategien gegen „Obsoleszenz“. Dessau-Roßlau: UBA Texte

¹²⁵ Berwald et al. (2020) Environmental evaluation of current and future design rules. PROMPT

¹²⁶ Defra (2011) Longer Product Lifetimes – Summary Report

¹²⁷ EEA (2017) Circular by design – Products in the circular economy

¹²⁸ Donati et al. (2020) indicate some of these circular economy measures result in reduction of several environmental indicators: –10.1% Global Warming Potential, –12.5% Raw Material Extraction (RME), –4.3% Land Use (LU) and –14.6% Blue Water Withdrawal (BWW).

second-hand sector (repair, refurbishment, remanufacturing) can also be expected with the introduction of measures 3a1 and 3a2. As a result, the workforce will be required to learn new skills.

Several organisations from the social and solidarity economy sector are active in the repair and refurbishing fields. As these organisations often recruit people from vulnerable social groups, a positive social impact can be expected in this regard too.

As discussed earlier, consumers may face an increase in purchase prices. This, however, is likely to be compensated by an equal or lower life-cycle cost because of the increased durability, resulting in a longer lifetime of products and improved efficiency. All the same, vulnerable sections of the society with limited purchasing power could face difficulties in purchasing more expensive products, especially those of daily use. Nonetheless, some of the negative impacts in this regard could be reduced through the incentive measures under PO5.

4.4. Sub-option 3b: Far-reaching sustainability requirements

4.4.1. Economic impacts

The economic impacts of sub-option 3b will be similar to those of sub-option 3a. Depending on the measure, however, differences will emerge.

With regard to the specific measures, whether measure 3b1 will entail any additional costs is unclear, as it intends to set horizontal requirements by wide groups of products. For measure 3b2, the impact will be limited to specific sectors (i.e. those for which remanufacturing is relevant), possibly including SMEs, given that these are often active in manufacturing product components. In the case of measure 3b3, the impact will concentrate in the upstream of the supply chain, in particular in third countries. Also, requirements on due diligence are likely to be accompanied by a requirement for third-party conformity assessment, which will increase the cost for businesses and facilitate the verification by Market Surveillance Authorities. From the estimates provided by industry representatives in targeted interviews (see Table 71 in Annex 11), it can be inferred that, in most cases, the increase in costs related to the measures of sub-option 3b is likely to remain below 5% of the current compliance costs.

4.4.2. Environmental impacts

Measures under sub-option 3b will bring additional environmental benefits because of more ambitious sustainability requirements. In particular, measure 3b1, covering a group of products, will contribute to reducing environmental impacts thanks to the economies of scale generated. The minimum requirements on remanufacturing¹²⁹ will close an important loop in the sectors concerned, by facilitating the re-use of product components and therefore reducing the environmental impacts associated with their production. Regarding measure 3b3, the requirements on due diligence will bring benefits along the supply chain, including in the third countries where the production facilities may be located, thus helping to improve global environmental standards.

4.4.3. Social impacts

The additional social impacts compared to sub-option 3a come from the introduction of requirements on due diligence (3b3) and will translate into an improvement of working conditions and human rights along the value chains, both within and outside the EU. Differently, the minimum requirements on re-manufacturability will create additional jobs.

¹²⁹ Reuse and remanufacturing, while less meaningful than delayed replacement, may still deliver significant environmental benefits (-1.36% GWP; -1.40% RME; -0.33% LU; -2.33% (source Donate et al.)

4.5. Sub-option 3c: Bans on some products

4.5.1. Economic impacts

Bans on specific materials or products can create problems in specific sectors where the banned materials/products serve as inputs, as in the case of the specialised lamps with mercury, which are used for drying in other industries where LED lamps do not deliver the same performance. However, because of its product-specific nature, the economic impact on businesses and public authorities is expected to be limited.

4.5.2. Environmental impact

Additional environmental benefits will be achieved in comparison with sub-option 3b. It will certainly bring positive environmental impacts, as the removal of products/materials with significant environmental impacts, e.g., single use products or products including materials which make their reuse/recycling difficult, have a direct effect on reducing a source of impacts.

4.5.3. Social impacts

The social impacts of this sub-option are similar in nature to those of sub-options 3a and 3b, but certainly of higher magnitude in comparison with sub-option 3b.

Banning some products could affect some citizen groups, as in the case of incandescent lamps, with older generations not feeling comfortable using LED and CFL lamps¹³⁰, at least for the first generations of products.

4.5.4. Impact on third countries

The impact on third countries of suboption- 3c would be similar to the previous two sub-options. Since the value chain of most products are spread across the globe, this sub-option will put in place new constraints resulting in an increase in compliance costs due to the minimum requirements under suboptions- 3a and 3b. The requirements in relation to due diligence (measure 3b3), however, have the potential to be bring added value across the supply chain, including in third countries. Finally, this sub-option will impact businesses in third countries producing or supplying the banned products, or their components or materials.

¹³⁰ Incandescent lamps were not banned per se, but led to a de facto ban because of minimum energy performance requirements. Measure 3c2, however, intends to ban specific products/materials, and its legal formulation will also influence the way it is implemented and the alternatives available.

4.6. Summary of impacts

Table 38 Administrative burden of PO3

| <i>Administrative burden Option 3</i> | | | | | |
|--|---|--|---|---|--|
| | | Businesses | | Administrations | |
| | | One-off | Recurrent | One-off | Recurrent |
| Measures 3a1, 3a2, 3a4, 3a5, 3a6, 3b2 | Direct costs | -- | - | - | +/- |
| | | Production and supply chain changes to fulfil minimum requirements (including testing facilities and training) | Personnel to design new, compliant products (depending on timing – if the implementation of the policy is aligned with the design cycle, no additional cost as the new product would have been designed anyway) | Setting up of the enforcement process (including training) (MS) | Monitoring compliance with the requirements (MS) |
| | | Durability testing equipment in product design departments | Personnel with Ecodesign competencies, including life-cycle assessment competencies where relevant | Government expenditures for conformity review (circularity aspects of a larger panel of products, increased recycling contents in products, premature obsolescence, etc.) | |
| | | Capital expenditures to adapt manufacturing processes, logistics and supply chains | Training for re-skilling, from the manufacturing of primary raw materials to that of secondary raw materials | Third party conformity assessment (assuming that MS might not be able to conduct the conformity review for all aspects) | |
| | Capital expenditures to process secondary raw materials | Higher personnel activity in the design phase of industrial products, in industrial engineering (design of production processes), in buying departments and in logistics. | | | |
| | | Higher personnel activity dedicated to the support of professional transitions from activities reduced by these requirements towards those favoured by them (i.e., maintenance, repair/upgrade, refurbishing, remanufacturing) | | | |

| | | | | | |
|--------------------|----------------|---|---|--|--|
| | | | Higher activity in after-sales, maintenance, repair, refurbishing and re-manufacturing services Personnel cost to carry out testing and verification | | |
| | Indirect costs | -- | - | - | n.a. |
| | | Higher up-front cost of products due to, inter alia higher-quality materials, more accurate assembly, better qualified manufacturing work force, more thorough design, and reversible assembly methods (possibly compensated by longer service times) | Increased cost of products due to the higher costs due to minimum requirement obligations | Changes required in other policies (EC and MS) | |
| Measure 3a3 | Direct costs | -- | +/- | - | +/- |
| | | Identification of alternative substances and possible changes in production processes Identification of suppliers of alternative substances Training of personnel | Monitoring of product performance (reliability, durability, impacts) in consideration of the new substances | Setting up of the enforcement process (including training) (MS) Government expenditures for conformity review (circularity aspects of a larger panel of products, increased recycling contents in products, premature obsolescence, etc.) Third party conformity assessment (assuming that MSs might not be able to conduct the conformity review for all aspects) | Monitoring compliance with the requirements (MS) |

| | | | | | |
|--------------------|----------------|---|---|---|--|
| | Indirect costs | n.a. | - Increased cost of products due to higher costs of alternatives Lower cost and better circularity for downstream businesses as circularity hindering substances removed | +/- Changes required in other policies (EC and MS) | n.a. |
| Measure 3b1 | Direct costs | - Establishment of production and supply chain changes for the group of products (including testing facilities and training) | - Personnel cost to carry out testing and verification | +/- Development of SPI measures (EC) Setting up the enforcement process (including training) (MS) | +/- Monitoring of compliance with the SPI measures (MS) |
| | Indirect costs | n.a. | - Increased cost of products due to the new SPI measures Reduced cost because of simplification, thanks to SPI measures targeting product groups instead of individual products | +/- No additional costs as systems are already in place for SPI measures | +/- No additional costs |
| Measure 3b3 | Direct costs | -- Setting up of systems for due diligence | -- Personnel cost to carry our due diligence | -- Establishment of due diligence requirements (EC) Setting up of the reporting process for due diligence (including training) (MS) | -- Monitoring compliance with due diligence requirements (MS) |

| | | | | | |
|----------------------|----------------|---|--|--|---|
| | Indirect costs | n.a. | - Increased cost of products due to higher costs resulting from due diligence Reduced regulatory risks | - Changes required in other policies and negotiations in international fora like WTO, FTAs etc. (EC and MS) | n.a. |
| Sub-option 3c | Direct costs | -- Adaptation of the supply chain because of banned products and substances Changes in production and information systems | - Personnel cost to carry out testing and verification | - Identification and rationale of the ban (EC) Setting up of the enforcement process (including training) (MS) | - Monitoring compliance with the requirements (MS) |
| | Indirect costs | n.a. | -- Increased cost of products due to the higher costs of replacing substances or products | - Changes required in other policies (EC and MS) | n.a. |

Table 39 Economic impacts of PO3

| <i>Economic impacts</i> | | | | |
|---|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 3a</i> | <i>Option 3b</i> | <i>Option 3c</i> | |
| <i>Direct impacts</i> | | | | |
| Cost of products increases | - | -- | --- | <p>The cost increase due to the minimum requirements could be passed on to consumers by manufacturers. POs 5 and 6 could help in reducing this impact through incentives and/or Circular Business Models.</p> <p>Consumers (B2C products) or intermediate users (B2B products) will be affected by increased prices. Businesses may or may not benefit in terms of turnover increase, depending on the sales remaining constant/increasing or decreasing.</p> |
| Growth in after-sales, maintenance, repair, refurbishing, re-manufacturing activities. | ++ | ++ | ++ | <p>3a and 3b explicitly target minimum requirements on the relevant aspects and a growth in markets dealing with post first-use of products can be expected.</p> <p>Companies in these specific repair/second-hand market will benefit, most of them being SMEs.</p> |
| <i>Indirect impacts</i> | | | | |
| Increased activity related to the design of circular products and production processes, increased research and innovation | + | ++ | ++ | <p>Researchers and research departments in companies will be impacted.</p> |

| | | | | |
|---|----|----|----|---|
| Increased market share for EU companies, in particular SMEs | ++ | ++ | ++ | As most companies in the repair, refurbish, and recycling sector are EU SMEs, a policy push as planned under 3a, 3b and 3c will be beneficial for them. |
| Fewer new products are sold on the EU market | - | - | - | Fewer new products could mean a loss of turnover for manufacturers in the short term. However, better quality products could bring a premium and in the long run this negative economic impact will be compensated. |
| Decreasing activity for companies producing single-use, low-cost products | - | - | -- | This possible indirect negative impact (direct impact in case of 3c) for the economy but will bring significant environmental benefits. |
| Decreasing activity for the mining and quarrying sector | - | - | - | The decrease in activity is due to a longer lifetime and availability of high-quality recycled materials. Companies involved in mining will be affected, and potentially companies using virgin materials as well. |

Table 40 Environmental impacts of PO3

| <i>Environmental impacts</i> | | | | |
|---|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 3a</i> | <i>Option 3b</i> | <i>Option 3c</i> | |
| <i>Direct impacts</i> | | | | |
| Buyers choose more durable, reliable, and repairable products | ++ | +++ | +++ | By delivering sustainable products, sub-options 3a and 3b will show positive environmental effects. 3c could also deliver additional benefits by banning unreliable products. |
| Less sustainable options are driven out of the market | ++ | ++ | ++ | All sub-options will be effective in influencing consumer behaviour through choice editing. |
| Substances of concern are gradually replaced by safer alternative | ++ | ++ | +++ | All sub-options provide for measures removing products/materials and will have similar impacts. |
| Better management of products life cycle | + | ++ | +++ | Sub-options 3b and 3c ensures a better management of product life cycles. |
| More secondary materials are used in production | ++ | ++ | ++ | To enable more secondary materials availability, high quality recycling is needed. This aspect is target by 3a and to certain extent by 3b too. |
| <i>Indirect impacts</i> | | | | |
| Reduction of the indirect environmental impacts associated with the production of new products are diminished as demand decreases | ++ | +++ | +++ | |
| Diminished release of harmful chemicals in the environment | + | ++ | +++ | |

| | | | | |
|--|---|----|----|--|
| Decreasing environmental impact of material extraction | + | ++ | ++ | Minimum requirements under 3a and 3b will enable a reduction in the need of virgin material. Citizens will be impacted including in third countries where mines are located. |
|--|---|----|----|--|

Table 41 Social impacts of PO3

| <i>Social impacts</i> | | | | |
|---|---------------------------|------------------|------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 3a</i> | <i>Option 3b</i> | <i>Option 3c</i> | |
| <i>Direct impacts</i> | | | | |
| Increased incentive for manufacturers to improve working conditions | + | ++ | ++ | Workers involved in the value chain of products will be impacted. |
| Higher upfront costs for new products, or lower prices for refurbished products or easy repair faced by consumers | +/- | +/- | +/- | Consumers will be impacted, in particular those from lower income groups. |
| <i>Indirect impacts</i> | | | | |
| Friction on the labour market as some sectors see an increasing demand, while others a declining one | - | - | - | Workers in specific sectors will be impacted (possibly also in third countries), which in turn will impact their families. |
| Companies invest in training and reskilling activities to address new demand | ++ | ++ | ++ | Workers in specific sectors will be impacted. |

5. OPTION 4: SUSTAINABILITY INFORMATION FOR CONSUMERS AND B2B

5.1. Overview

Sub-option 4a: Enhanced information requirements

- Measure 4a.1 – Information requirements on the durability (technical lifetime) or reliability (mean time between failures) of the product or its components
- Measure 4a.2 – Information requirements on reparability and upgradability, including a reparability scoring
- Measure 4a.3 – Requirement to inform on the presence of substances of concern and to trace them
- Measure 4a.4 – Information requirements on the recycled content on the product or components (e.g., plastic parts)
- Measure 4a.5 – Information requirements on the environmental impacts along the life cycle of the product, for example in the form of an Ecological Profile
- Measure 4a.6 – Information requirements in the form of sustainability performance classes
- Measure 4a.7 – Information requirements on a set of social indicators

Sub-option 4b: European Digital Product Passport

- Measure 4b.1 – Information requirements in the form of a European Digital Product Passport through SPI acts
- Measure 4b.2 – Integration or close coordination of the SCIP Database (Article 9(1)(i) and 9(2) of the Waste Framework Directive) with SPI requirements

Sub-option 4c: Generalised European Digital Product Passport

- Measure 4c.1 – Direct implementation of a European Digital Product Passport to some “cross-sectoral” information requirements and possibility to add product-specific requirements through SPI measures

5.1.1. Assumptions used in the analysis

- Most data needed for information requirements already exists at some stage of the life cycle of the item and companies are able to retrieve it.
- The cost assessments are based on previous legislative acts which are considered to be comparable.

5.1.2. What problem(s) and specific objective(s) does this option address

PO4 tackles the following problems: (i) the lack of incentives to produce more sustainable products and retain value; and (ii) an imperfect information whereby economic actors and citizens lack reliable information on product sustainability. Therefore, it will address problems 1.a. (Product design does not sufficiently take into account environmental and social impacts over the life cycle, including circularity aspects) and 1.b. (Too difficult for economic operators and citizens to make sustainable choices in relation to products).

As for specific objectives, it will support the attainment of the following:

- Improve product sustainability;
- Improve access to sustainability information along value chain; and
- Incentivise more sustainable products and business models to improve value retention.

In all sub-options, PO4 essentially supports the implementation of the environmental sustainability requirements placed on products, as defined in PO3. In particular, the obligation to provide information is expected to improve compliance: should sustainability requirements under PO3 not be made compulsory, the information requirement would offer the opportunity to encourage economic operators to follow these requirements on a voluntary basis. The scope of products is defined in PO2 and all stages of the life cycle are affected by measures under PO4, as information needs to be collected along the life cycle and can be used at different stages (design, use phase, end of life, etc.).

Stakeholders' views on PO4

Stakeholders had several opportunities to provide input to the discussion on PO4, focussing on **the modalities of implementing a European Digital Product Passport**. The main topics included:

- What information exactly is to be shared under each measure;
- Who should have access to specific information and how it should be displayed; and
- When should requirements be set at the product, product category or value chain level.

Importantly, the discussion offered insights on how information requirements will help reach the specific objectives, and what costs and difficulties this might entail, but did not provide specific observations on the differences between the sub-options.

The introduction of information requirements to improve the situation compared to the baseline **gained overall support**: 58% of respondents to the OPC agreed or strongly agreed that economic actors do not have adequate and reliable information on the sustainability of products. [_](#)

As barriers to making products sustainable, the lack of awareness of sustainable production practices and methods was mentioned on the producers' side, while consumers cited the lack of education among citizens on issues related to sustainability. Further, the lack of adequate information on, for instance, the embedded carbon footprint in materials was also considered a challenge. Also, information on, for example, the sustainability of products along the entire value chain or the product impact across its life cycle is not available on the consumers' side. When asked about what measures would support the overall sustainability of products in the EU, information requirements were favoured by up to 55% of respondents to the OPC.

In the OPC, stakeholders were also invited to identify **the biggest challenges to a successful establishment and implementation of a European Digital Product Passport**. The results provide an insight into what aspects they consider to be of critical importance. Interestingly, the cost and the (negative) environmental impact of a European Digital Product Passport, which are currently hard to quantify, came last (with 147 respondents choosing this challenge corresponding to 25%). On the contrary, the two biggest challenges were: "Managing the complexity of products and value chains, and the quantity of data that is required to make such a passport effective" (469 respondents corresponding to 79%) and "Ensuring the relevance and reliability of the information included in the passport" (440 respondents corresponding to 74%). [_](#) Similar views were shared by all groups of stakeholders including EU citizens.

- *Stakeholders' views on sub-option 4a*

The introduction of information requirements to improve the situation compared to the baseline gained overall support: 58% of respondents to the OPC agreed or strongly agreed that economic actors do not have adequate and reliable information on the sustainability of products. At least 75% of NGOs, consumer and environmental organisations, public authorities and academic institutions strongly agreed or agreed compared to 46% of business associations.

Information requirements, as measures in support of product sustainability, were favoured by 55% of respondents. More than half of respondents gave scores of at least 4 out of 5 to the measures related to providing information on product's average lifespan, material sources, repairability and access to repair services. However, there was less support for providing such information from business associations (receiving between up to 37% of the score at least 4 out of 5).

The magnitude of the impact will obviously depend on the quality of the information provided. In the targeted survey, respondents displayed a lack of consensus over the reliability of current social and environmental auditing (31% were neutral, 27% thought it is unreliable, 32% found it is reliable).

- Stakeholders' view on sub-option 4b

There was **overall support for the introduction of a European Digital Product Passport** (therefore going beyond 4a): when asked which information should be included in a European Digital Product Passport, each of the 17 propositions received a positive answer from between 46 to 90% of respondents to the OPC. Support from different stakeholders varied depending on the information proposition: there was strong support for providing the information on the product recyclability and safe use across all stakeholders (at least 75% of all groups of stakeholders agreed or strongly agreed with these measure). On the other hand, requirements to disclose information relevant to remanufacturing or spare parts were not so well supported by business associations, with only 20% agreeing or strongly agreeing. Similarly, on the need to include information on the quantities of materials and substances contained in the product, 25% of business associations agreed or strongly agreed, compared to more than 88% of NGOs, environmental organisations, public authorities, consumer organisations and academic institutions. EU citizens shared similar views as non-business stakeholders.

As part of the SME survey, companies were invited to rank the most likely environmental impacts of introducing a European Digital Product Passport (sub-options 4b and 4c). 62% of respondents ranked as very probable or probable the impact "Contribute to increasing the amount of products with low climate impact"; 60% ranked as very probable or probable the impact "Contribute to lower pollution in air, land and water"; 57% ranked as very probable or probable the impact "Gradually phase out the use of environmentally harmful materials in products on the EU market"; and 47% ranked as very probable or probable the impact "Contribute to the mitigation of biodiversity loss". For all statements, the share of "very improbable" responses was between 7% and 10%.

As part of the same survey, companies were also invited to rank the most likely economic impacts of introducing a European Digital Product Passport. 56% of respondents ranked as very probable or probable the impact "Increase the administrative burden due to higher monitoring and reporting obligations"; 42% ranked as very probable or probable the impact "Contribute to higher economic returns for EU companies"; and 42% ranked as very probable or probable the impact "Contribute to the decoupling of economic growth from environmental impact in the EU". For all statements, the "very improbable" response received 6% of the votes.

Finally, companies were also invited to rank the most likely social impacts of introducing a European Digital Product Passport. 53% of respondents ranked as very probable or probable the impact "Contribute to consumer empowerment due to greater availability of product information"; 44% ranked as very probable or probable the impact "Contribute to decent conditions of work"; and 41% ranked as very probable or probable the impact "Contribute to the reduction of environmental crime at a global level". For each statement, the "improbable" and "very improbable" responses were chosen by, respectively, 15%, 22% and 21% of respondents.

MS representatives who attended the different stakeholder workshops related to this topic expressed the general view that increased product information will be crucial for advancing the objectives of the SPI and that consumers should also be a key target here. The idea of a European Digital Product Passport was well received by participants, but some cautioned that such a passport should not be overloaded with too much information and should remain simple to understand, also for consumers.

- Stakeholders' view on sub-option 4c

According to stakeholders' statements in the dedicated workshop, the European Digital Product Passport is likely to come at a higher cost for the industry and might result in a lower quality of the information provided. Respondents to the OPC and participants to the workshop expressed concerns about horizontal requirements and preferred a gradual implementation, with product-specific requirements, to ensure the relevance of the information demanded. A progressive implementation, with product-specific guidelines, was indicated as the preferred option, therefore leaning towards sub-option 4b. Also, some stakeholders (MSs and

businesses) raised the point that maybe not all information requirements should be part of a European Digital Product Passport, as the cost might outweigh benefits, depending on the specific products, again favouring sub-option 4b over 4c. This, however, presumes that granularity allows to identify what information needs to be part of the passport and what other can be provided by other means. Particularly, stakeholders raised the concern that there should be a distinction between SMEs and large companies, since SMEs may lack capacity to comply with the European Digital Product Passport requirements.

In the OPC, SMEs considered that the following information should be collected in a European Digital Product Passport (>50% agree or strongly agree, in order of agreement): how product should be recycled/handled at end of life (81%, n=59); instructions and safe use (75%, n=57); product environmental and/or carbon footprint (75%, n=60); presence of hazardous chemicals (75%, n=59); relevant information for testing, disassembly, maintenance, repair or reassembly (72%, n=57); economic actors at the origin of information (71%, n=58); list of present materials/substances in product (68%, n=60); expected lifespan of product (67%, n=58); list of legislation and standards complied with by product (67%, n=60); any possession of sustainability labels (66%, n=58); recycled content of each material present in product (63%, n=60); quantities of materials and substances present in product (63%, n=60); information on origin of product components (61%, n=59); results of compliance tests against legislation/standard/technical specifications (60%, n=60); information on material sources (59%, n=58); information relevant to re-manufacturing and spare parts (56%, n=57); and social conditions along the value chain (56%, n=59).

5.2. Baseline for PO4

Several existing EU regulatory instruments address, to various extents, the issue of access to information on products, and on their sustainability, safety and content. In the specific product regulations, some sustainability dimensions (e.g., energy efficiency, hazardous components) are covered better than others (e.g., circularity, footprint). In the context of the SPI, importance is put on information about the circularity of the product (as promoted by PO3 measures). Therefore, the baseline for PO4 is similar to the one of PO3.

In general, legislative acts with more ambitious requirements for products also offer more information about these features. Indirectly, such communication schemes support the environmental, economic and social benefits of the products, too. The relevant examples of such schemes are listed below:

- The **Ecodesign Directive**, in complementarity with the Energy Labelling Regulation, will continue applying *energy efficiency labelling* for products falling within its scope. For selected products, labels also include information on water use, storing capacities and noise emissions. The Energy Labelling *product databases* will also offer information on products. Differently, the *product Ecological Profile* has not been applied yet and whether it would be used in a ‘no SPI’ scenario remains unclear. Better and clearer communication on circularity performance is not likely to be ensured without a dedicated arrangement for integrating this information in the labelling system. In this respect, the European Commission’s Joint Research Centre is preparing a *reparability scoring* to be introduced under the Ecodesign legislation¹³¹.
- The newly proposed **Batteries and Waste Batteries Regulation** includes several provisions to improve the supply of information on batteries performance. A printed and online *labelling system* will provide basic and more tailored information to consumers and end users (e.g., *duration, carbon footprint, some chemicals*). An *electronic exchange system* and a *battery passport* are also envisaged and should be accepted by several global organisations. More in detail, the *battery passport* will enable second-life operators to make informed business

¹³¹ JRC (2019). Analysis and development of a scoring system for repair and upgrade of products. JRC Technical Report. Seville.

decisions, and recyclers to better plan their operations and improve their recycling efficiencies. It shall allow access to information about the values for the *performance and durability parameter*, while whether it will show information on hazardous chemicals, recycled content and environmental impact is less clear. Under the baseline scenario, the new Batteries Regulation provisions on labelling, electronic exchange system and battery passport are expected to be implemented until 2030.

- The **End of Life of Vehicles Directive** also ensures access to comprehensive information on the reparability and safety of cars, while the **SUP Directive** secures access to information on recycled content and other features.
- The **Initiative on Empowering Green Consumers** (prepared by DG JUST) will ensure that the *consumers will have better information on sustainability/environment characteristics of products*, and will be better protected from misleading practices that lead consumers away from sustainable purchases, by amending existing consumer protection. The proposed changes, e.g. better information for consumers, are expected to be introduced even in the absence of the SPI.
- The **legislative proposal on substantiating green claims** (currently assessed by DG ENV) is highly relevant for PO4, as it aims to establish a *voluntary EU legal framework enabling companies to substantiate green claims in accordance with the European Commission Environmental Footprint methods*. These methods cover 16 categories of environmental impacts¹³² offering a comprehensive coverage and relies on internationally developed scientific methods, extensively road-tested by more than 20 industrial sectors during a pilot phase that took place between 2013 and 2018. This initiative is likely to progress until 2030 (e.g., becoming a basis for the EU Ecolabel¹³³).

The last two initiatives address the problem of the reliability of information about products' performance and impact, an issue, which is of increasing importance for consumers, businesses and public procurers. Arguably, existing instruments do not sufficiently ensure the reliability of claims. In addition, the high number of products, and the variety of labels and schemes hinder correct choices. Under the baseline scenario, in the absence of the SPI, the potential benefits of the two new initiatives are not likely to be fully reaped, missing the support of the SPI (which could extend the provisions of the new tools to specific product groups). In particular, a smaller group of products covered by the Ecodesign Directive in the 'no SPI' scenario will result in a more limited scope for the new initiatives too. At the same time, synergies between the Empowering Consumers for the Green Transition and Green Claims initiatives can also contribute to extending the impacts of both.

Important communication instruments deployed by both the European Commission and many MSs are **green or ecolabels for products**. The EU Ecolabel is currently the only pan-European environmental label and a scheme for communication of environmental excellence. The last fitness check of the Ecolabel¹³⁴ confirmed its relevance and positive role in reducing the environmental impact of consumption and production. However, it noted that the contribution is limited compared to the overall breadth of the challenges to be addressed with regard to total consumption and production. At the same time, four out of five of the EU Ecolabel stakeholders found that the EU Ecolabel is a valuable tool to facilitate higher uptake and free circulation of green products across Europe (see also the baseline for PO5).

The information flow about the presence of hazardous substances on their own or in mixtures in products is regulated by the **Classification, Labelling and Packaging (CLP) and REACH**

¹³² <https://ec.europa.eu/environment/eussd/smgp/communication/impact.htm>

¹³³ Strategic Work plan for Ecolabel for 2020-2024 [EU Ecolabel Work plan 2020-2024 Dec 2020.pdf \(europa.eu\)](https://ec.europa.eu/euro-ecolabel/2020-2024-work-plan)

¹³⁴ EC (2017) EMAS and Ecolabel Fitness Check, more information available at: https://ec.europa.eu/environment/emas/emas_publications/policy/fitness_check_en.htm

Regulations, and more recently also by the **Waste Framework Directive**. However, the provision of information in this regard is not always ensured and its availability in the supply chain is reduced when substances or mixtures are incorporated into articles. Even less information is available when products become waste and are subject to recovery operations. The absence of this information hinders the transition of materials from waste to the “recovered” or “secondary raw material” status and, further downstream, makes it difficult to apply product, chemical and other legislation where such knowledge is needed. Some legislative acts do contain provisions requiring information exchange concerning mixtures and products (e.g., the legislation on food contact materials) but, to date, it has proven difficult to apply these requirements due to issues of confidentiality and complexity¹³⁵.

To conclude, the baseline scenario shows that, in the absence of the SPI, the existing policy instruments will be able to contribute to or mobilise the positive impacts of such products as selected energy goods, batteries and vehicles, not closing, however, the gap on other products (for further details, see PO3). The biggest impact is expected from the new legislation on substantiating green claims, as it is likely to promote more trustworthy and (PEF) methodologically proven environmental performance, while ensuring consumers access to more detailed information and more trust in green products. In addition, the current application of the Ecolabel may push producers of labelled products to revalidate the environmental performance of their products based on the sounder PEF method. This will help to ensure the reliability of information on products and remove products with insufficient environmental performance from the priority green list of the market.

5.3. Sub-option 4a: Enhanced information requirements

5.3.1. Economic impacts

Manufacturers and importers would be the first stakeholders to be affected, as an obligation is introduced for them to disclose and make available the information required. However, a longer list of economic operators’ would benefit from the information made accessible, i.e. maintainers, repairers, re-furbishers, re-manufacturers, recyclers, logistics companies, retailers, including on-line sellers, and second-hand retailers. Workers along the supply chains would also be affected. In addition, customers (consumers, companies and public authorities) stand to benefit as well, as the literature shows that, if presented with product sustainability information, they are two to three times more likely to choose the most sustainable option (*ceteris paribus*, but also in case of a moderate price increase; for further details on willingness-to-pay, see below)¹³⁶. Finally, Market Surveillance and Customs Authorities would be affected as the authorities in charge of ensuring the enforcement of the measures.

5.3.1.1. Administrative burden

- Administrative burden for economic operators

Sub-option 4a will require product manufacturers and importers to collect, store and display information. In a well-managed industrial process, all data to be included should be available at some stage of the life cycle of the item (e.g., in the design phase or in the mine where the mineral was extracted), and in one link of its value chain (e.g., in the manufacturing factory of the screen of a smartphone). Also, most of the required information would have been collected already for the

¹³⁵ COM(2018)32 Communication on the implementation of the circular economy package: options to address the interface between chemical, product and waste legislation <https://ec.europa.eu/docsroom/documents/27321>

¹³⁶ https://ec.europa.eu/info/sites/default/files/ec_circular_economy_final_report_0.pdf

purpose of the measures included in PO3. However, gathering this information under a certain form may require substantial work in data management (specially to ensure an interoperable format)¹³⁷.

Some legislations already provide for the collection and reporting of the information items listed in sub-option 4a for specific sectors. For example, the presence of certain groups of substances of concern is regulated in existing legislative acts: the REACH Regulation and the Waste Framework Directive require to communicate the presence of substances of very high concern in all products, if the concentration of those substances is higher than 0.1% (w/w). Also, the CLP Regulation contains information requirements for certain types of products (e.g., hazardous substances in chemical mixtures such as detergents), while other labelling requirements apply across sectors (e.g., for allergens in cosmetic products). In addition, elements of sustainability are covered under various legislations (see the baseline, notably on energy efficiency) and social indicators also exist, sometimes as a voluntary practice, in the textile, wood products (EUTR) and chemicals (REACH) sectors.

Differently, information on technical lifetime and reliability (4a.1), reparability and upgradability (4a.2), and recycled content (4a.4) is overall not covered in the sectors included in PO2, regardless of the final scope. In the textile industry, the cost of the collection of information on durability and reliability was estimated by an industry association at about EUR 10 000 to EUR 20 000 per company (to set-up the collection process, especially in the absence of standards for estimating durability). The deployment of methods such as PEF should support businesses (and especially SMEs) in providing information under 4a.5 (Information requirements on the environmental impacts along the life cycle of the product, for example in the form of an Ecological Profile). This is considered as the second largest cost driver in sub-option 4a, while the information requirements on a set of social indicators were indicated by stakeholders as the main cost driver, resulting in an estimated 3.08% administrative cost increase (see Table 77 in Annex 11).

Once information is collected, companies will have to display it to users, which would imply changes in labelling and possibly making the information available online. Also, different types of information are expected to be made accessible to different actors, i.e. manufacturers, consumers, recyclers, etc.

- Administrative costs for the European Commission

The European Commission is expected to be in charge of defining information requirements. Based on existing legislation and schemes, the development of the specifications of the additional information needs is estimated at around EUR 1 000 000 (see chapter on the administrative set-up).

- Administrative burden for Member States

Compliance costs will be driven by the costs of outsourcing, as the IT staff at the MS level might not be enough to conduct the verification processes. Market surveillance will entail costs related to requesting access to the data and screening it, by product. However, direct access and possibilities to automatically process information are likely to provide efficiencies, which can be translated into cost reductions or re-invested in better market surveillance for higher compliance rates.

5.3.1.2. Direct economic impact for businesses

In addition to the administrative burdens described above, other direct costs are expected due to substantive obligations (IT systems to be set in place, testing staff needed), operation (energy to run the system) and maintenance (staff needed to keep data up-to-date).

Substantive obligations (CAPEX and OPEX) are often identified by the industry as the main cost driver. Some of these costs are shared with PO3 (setting sustainability requirements) and will be borne once only, like:

¹³⁷ See the dedicated report produced under Task 6 of this assignment for further details

- one-off investments in durability testing equipment in product design departments;
- costs to set up the information collection process (including access to testing facilities and training); and
- personnel cost

Differently, other costs will be specific to the information requirements placed under PO4, as the connection between the internal design and manufacturing ICT systems, and the standardised system making this information available to the relevant stakeholders under a standard format.

SMEs, like all other businesses, will also have to face the cost of new information collection and reporting. However, some stakeholders reported (for the textile industry) that this will be more challenging for SMEs than for larger companies.

However, companies will potentially benefit from the implementation of PO4, being able to display information to customers (B2B and B2C) and better valorise their investment towards sustainability. Also, the introduction of EU-wide requirements would increase consumers' trust in the information provided (especially if associated with the Green Claim Initiative). The industry indicated support for these measures to the extent that it creates a level playing field in Europe and beyond, providing a common framework for measuring and reporting information. This could provide cost-efficiencies, as at the moment, for some industries (e.g. textiles), a lot of private initiatives are ongoing in a rather uncoordinated way. An EU framework would support the scale up of those initiatives. Nonetheless, companies and associations of different sectors expressed a lack of capacity to properly anticipate direct economic benefits, as these will depend on the exact implementation, enforcement, and market reaction.

In addition, companies acting as purchaser of products and subject to their own information requirements, or active in the sectors of after-sales, maintenance, repair, refurbishing and re-manufacturing, will directly benefit from the better information received. This would apply for the products that they receive from their suppliers, as this information will be directly available for consolidation (e.g., to compute the environmental or social impact of the entire product based on that of its parts) or operational use (increased efficiency, lower cost and higher quality of maintenance, repair and recycling).

5.3.1.3. Indirect economic impact for businesses

Sub-option 4a will encourage manufacturers to invest in more sustainable manufacturing processes, logistics and supply chains (including training), and in the design phase of industrial products, industrial engineering (design of production processes) and buying departments. The same effect has been observed following the introduction of past legislation on energy labelling¹³⁸. As a result, the cost of production will increase for those companies that currently do not invest in sustainable solutions and prioritise lower production costs.

While the unit cost (and use-value) of products is likely to rise as a result of both information requirements and the changes in demand that they are meant to trigger, a lower number of products is expected to be manufactured and sold per year, as consumers do not need to replace them as often. This is likely to be true for products for which consumers show a strong willingness to pay for improved reparability and durability (see below the paragraph relating to the economic impact for citizens).

5.3.1.4. Economic impact for citizens

In sub-option 4a, when purchasing products citizens will have access to a wider set of information than is currently the case. While the cost of providing information incurred by companies is likely to

¹³⁸ JRC (2017), Boyano A., Moons H., Villanueva A., Graulich K., Rüdener I., Alborzi F., Hook I., Stamminger R., (2017) Eco-design and Energy Label for household dishwashers, EUR 28645 EN

be transferred to the customers, they will be capable of choosing items that increasingly offer better value for money (longer lasting, easily repairable). Depending on their willingness to pay more for more durable products, consumers will benefit to a lower or higher extent from the measure. According to a recent study¹³⁹, which measured the willingness-to-pay based on information on reparability and durability, consumers's willingness-to-pay would increase most for large and expensive items (e.g. white goods such as washing machines, dishwashers). For other products, such as clothing, the increase in the willingness-to-pay is lower, but still positive: "Depending on how durability/reparability information was presented, willingness-to-pay for an additional year of durability ranged between EUR 20-36 for vacuum cleaners and dishwashers, EUR 92-148 for TVs, EUR 148-217 for smartphones, and EUR 14-27 for coats. Willingness-to-pay for an improved reparability rating was around EUR 29-54 for vacuum cleaners, EUR 83-105 for dishwashers, EUR 77-171 for TVs, EUR 48-98 for smartphones and EUR 10-30 for coats¹⁴⁰."

5.3.2. *Environmental impact*

Measure 4a.1 makes it easier for economic operators and citizens to choose products that have a longer and more stable lifetime (more reliable). As buyers choose more durable and reliable products, less sustainable products are driven out of the market, increasing the overall sustainability of the product stock. In addition, more reliable products with a longer lifetime decrease the need for replacement and lead to a decreased production of new products. As a consequence, the indirect environmental impacts associated with the production of new products are diminished.

Measure 4a.2 makes it easier for economic operators and citizens to choose products that can easily be repaired or upgraded. As a result, its direct and indirect impacts are similar to those of measure 4a.1.

Measure 4a.3 helps economic operators and citizens to choose products that minimise the presence of substances of concern. As a direct effect, substances of concern are gradually replaced by safer alternatives, if and when they become available. Their impact on the value chain is also mitigated, as tracing enables a better management of products containing substances of concern (notably during recycling and/or preparation for reuse). Indirectly, this measure helps to mitigate the release of harmful chemicals in the environment, at all stages of the life cycle, and decreases its related environmental and human health impact.

Measure 4a.4 informs on recycled content. It can result in higher confidence in the reliability of recycled materials and eventually create an incentive for higher recycled content in products. In other words, this measure supports the replacing of primary raw materials by secondary materials, therefore decreasing the environmental impact of material extraction and of the production of primary basic metals, materials and chemicals.

Measure 4a.5 makes it easier for economic operators and citizens to choose products that minimise their environmental impact. Similarly to measures 4a.1 and 4a.2, it supports the overall improvement of the product stock. Indirectly, this measure will decrease the environmental impact of products, at all stages of their life cycle.

Measure 4a.6 builds on previous successful experience with performance classes such as energy labelling¹⁴¹, and is expected to further facilitate consumers' understanding of the information provided and promote sustainable consumption. Studies focusing on different designs for energy labelling showed that the vast majority of consumers (above 90%) are aware of energy labelling and capable of

¹³⁹ LE Europe, VVA Europe, Ipsos, ConPolicy, Trinomics for the European Commission (2018) Behavioural Study on Consumers' Engagement in the Circular Economy https://ec.europa.eu/info/sites/default/files/ec_circular_economy_final_report_0.pdf

¹⁴⁰ *ibid*

¹⁴¹ See Technical report to the Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive https://ec.europa.eu/energy/sites/ener/files/documents/Final_technical_report-Evaluation_ELD_ED_June_2014.pdf

identifying the most energy-efficient product thanks to labelling scales that sort products in different performance classes¹⁴². As previous measures encouraging sustainable consumption, measures 4a.6 will help to diminish the negative environmental impacts of production and consumption (see Annex 14 for further details about the articulation between the SPI and the Green Claims Initiative). Moreover, the availability of environmental performance classes will allow a wider use of financial and non-financial supporting schemes both at EU and national level (see PO5).

Measure 4a.7 has no environmental impact.

Overall, based on the consultation conducted with stakeholders throughout this study and the knowledge of the experts involved, environmental gains can be roughly estimated as follows:

- the work of all players intervening in the product life cycle (maintenance, repair and recycling) is facilitated:
 - 5% cost reduction of maintenance and repair¹⁴³
 - 4-25% increase in the maintenance and repair rates¹⁴⁴
 - reduction in the number of consumer products being sold per year by 0.1 to 0.2%, and hence a proportional reduction of their environmental impacts upon production¹⁴⁵
 - increase in the quantity of high-purity recycled materials, leading to a potentially significant increase of the contribution rate of recycled materials to raw materials demand from 6% to 78% for plastics, from 13% to 84% for aluminium and from 24% to 81% for steel¹⁴⁶.

For sub-option 4a, the generation, storage, and display of information is not expected to require a significant additional use of material and energy, with the related environmental impacts. This is due to the assumption that most producers will store the information (most of which is assumed to be already available) in existing web pages.

5.3.3. *Social impact*

As purchasing practices and production processes change towards more sustainability, the workforce will shift from declining to growing sectors and jobs. For example, mining and quarrying is expected to de-grow, while maintenance, repair and recycling services are expected to be boosted by the proposed initiative. This results in an increased need to re-skill the workforce and mitigate the territorial impacts of the economic transition. Initiatives to ensure a just transition (such as the Just Transition Mechanism) will be key in ensuring positive social outcomes.

Also, the introduction of information requirements on social indicators are expected to help to improve working conditions across the value chains, both in and outside the EU.

As mentioned above, due to the administrative burden generated by the PO, consumers will be faced with a higher cost per product. This cost is likely to be compensated by a higher use-value. However, vulnerable customers could face difficulties with a higher upfront cost of products, depending on the actual increase in prices. For reference, the (conservative) estimate included in the businesses' administrative burden points towards a rather limited price increase. In addition, the implementation of Circular Business Models such as rental and leasing (PO6) is susceptible to mitigate the issue of upfront costs for lower-income households and to better reflect the Life-Cycle Cost of the product.

¹⁴² *ibid*

¹⁴³ Deloitte Environment et al. (2016) "Study on socioeconomic impacts of increased reparability"

¹⁴⁴ SPI Impact Assessment supporting study

¹⁴⁵ Deloitte Environment et al. (2016) "Study on socioeconomic impacts of increased reparability"

¹⁴⁶ SPI Impact Assessment supporting study. Based on end-of-life recycling input rates (EOL-RIR), Eurostat

5.4. Sub-option 4b: European Digital Product Passport

5.4.1. Economic impacts

For sub-option 4b, the same stakeholders will be affected as for sub-option 4a.

5.4.1.1. Administrative burden

- Administrative burden for economic operators

A European Digital Product Passport (as included in sub-options 4b and 4c) would streamline information sharing compared to the situation which would be created by sub-option 4a, not including a harmonised digital infrastructure. It will reduce the leeway companies have in sharing information, but is expected to simplify the process of setting up the system. According to the SME survey, 56% of respondents anticipate a high to very high increase in the administrative burden compared to the baseline scenario. However, this must be put in perspective with the overwhelming support, across all stakeholders (including SMEs), for a European Digital Product Passport. As indicated with regard to indirect costs, 42% of SME respondents expect a higher economic return for EU businesses. In addition, the results of the consultations show that the expected environmental benefits are worth the cost of the measure.

In addition, measure 4b.2 improves the provision of the information required under measure 4a.3 and ensures that the tracing of substances of very high concern is not duplicated between the chemical and Ecodesign legislations. Therefore, this measure should result in more efficiency for companies, limiting the risk of double reporting and thus reducing their administrative burden.

Cost estimation

The costs related to the implementation of the EU DPP will change depending on the specific system architecture that will be developed in close coordination with the relevant stakeholders. Moreover, a number of companies and sectors are already implementing some sorts of track & tracing and passport-like systems (e.g. automotive sector, batteries, apparel). Where such systems are in place, the costs of the EU DPP will be lower compared to a company/sector that will start from scratch.

The use of a European Digital Product Passport by companies is expected to provide them with efficiencies in implementing the information requirements described under sub-option 4a. Overall, according to stakeholders' comments, this is expected to result in lower costs compared to sub-option 4a, with an average administrative cost increase of 2,31% in sub-option 4b, compared to 2,48% in sub-option 4a.

- Administrative costs for the European Commission

Under sub-option 4b, the European Commission would be in charge of supervising the set-up and governance of the European Digital Product Passport, including the coordination with existing databases (e.g. SCIP and EPREL). In the context of the secondary legislation preparations, the establishment of a central registry, hosting the unique identifiers and the track & tracing information, should be evaluated elements (see Annex 18 for more details).

The existing examples of passport-like systems and product-related databases developed at EU level are all centralised (or include an important "centralisation" component in their design). On the contrary, the EU DPP will be designed as a mostly decentralised system, making a direct cost comparison with similar systems developed at EU level not relevant.

Table 42 Past assessment costs

| | EPREL Database ¹⁴⁷ | Batteries Centralized Database ¹⁴⁸ | Batteries Digital Passport ¹⁴⁹ |
|-------------------------|-------------------------------|---|---|
| One-off investment cost | €3 000 000 | €5 600 000 | €7 800 000 |
| Annual maintenance cost | €300 000 | €434 000 | €900 000 |

In the impact assessment for the revision of the Batteries Directive, the Centralized Database covers the whole scope of the Directive, while the Digital Passport only covers individual industrial batteries and batteries for electric vehicles. In the case of the European Digital Product Passport, providing a definitive estimation of costs is difficult at this stage, due to the peculiarities of its proposed structure.

A decentralised/distributed system is expected to have a lower administrative burden for the European Commission compared to a fully centralised one. The only system that includes some common elements to the EU DPP is the tobacco products track & tracing system (as implemented through Commission Implementing Regulation 2018/574). However, even in this case a direct comparison of costs is not possible. The tobacco products track & tracing system has been designed with the main objective of combatting illicit trade of tobacco products, and therefore it includes specific security features that makes the whole cost higher than what would be needed for the EU DPP. Table 43 below reports the main cost element for the tobacco products track and tracing system (all costs have to be covered by the tobacco manufacturers).

Table 43 Estimated costs for tobacco products track & tracing system

| Cost item | Annualised cost (EUR million) | Cost per unit pack (EUR) |
|--|-------------------------------|--------------------------|
| Marking packages with a unique identifier | 43.0 | 0.001451 |
| Recording and transmitting data | 48.7 | 0.001642 |
| Processing, storing and accessing data | 10.5 | 0.000353 |
| Compatibility of components of the traceability system | 37.6 | 0.001268 |
| Security feature | 14.9 | 0.000502 |
| TOTAL | 154.6 | 0.005216 |

Most of the features listed in Table 43 would not be required for the EU DPP, at least not with the same level of stringency (e.g. there will be no need to send all information to a centralised database, there will be no anti-tampering devices for unique identifiers, there will be no need to have an independent unique identifier issuer, etc.).

¹⁴⁷ European Commission (2015) Impact assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU, SWD(2015)139 final https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_impact_assessment_part1_v7.pdf

¹⁴⁸ European Commission (2019) IMPACT ASSESSMENT REPORT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) 2019/1020, SWD/2020/335 Final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2020:335:FIN>

¹⁴⁹ ibid

The setting-up and management of the central registry would be comparable to the tobacco registry, which cost¹⁵⁰ is estimated in the order of **1.4 € per ten thousand unique identifiers**. This cost is additional to the ones included in Table 43.

The exact costs will depend, among other things, by the number of identifiers processed on a yearly basis, the amount of data to be included in the track & tracing system, the availability of statistical analysis tools.

Based on the information collected and the extrapolation of the costs for other decentralised systems currently under development, a very preliminary estimation of the costs for the Commission of setting up and maintaining the European Digital Product Passport would total around EUR 8 million as one-off investment and at least EUR 1 million as annual maintenance cost.

However, though coming at a cost for the European Commission, the infrastructure is also expected to provide access to a wealth of structured information, which can then be used to derive market intelligence and improve policy making in the future, by both the European Commission and Member States. The economic benefits deriving from the availability of this data are difficult to estimate at this stage, but are expected to be at least in the same order of magnitude of the European Digital Product Passport deployment and maintenance costs.

- Administrative burden for Member States

Under sub-option 4b, MSs will benefit from the same improvements as under sub-option 4a. In addition, a European Digital Product Passport is expected to be a powerful tool to easily access all necessary information and identify gaps in reporting.

One component of the economic burden on public authorities is determined by the cost of the equipment required to conduct inspection and control operations properly (scanners and verification equipment). According to the previously done impact assessment (e.g. for the tobacco products track and tracing system), there are many kinds of scanners that allow the reading of a range of various forms of data carriers depending on their nature. As a result, the effect is proportional to the quantity and kind of data carriers to be used for the European digital product passport.

5.4.1.2. Direct economic impact for businesses

The direct economic costs of sub-option 4b relate to the set up the IT infrastructure for the European digital product passport. According to a textile association, this will have a differentiated impact depending on existing systems within companies. Large companies with existing IT infrastructures used for different purposes will have to restructure their IT system to allow for better information exchanges across their internal infrastructure, to finally provide all necessary information within the European digital product passport. For SMEs that do not yet have such complex systems, the cost will be less as they will be able to start from a clean slate. The installation and operation of the IT system will result in increased CAPEX and OPEX, as already described in sub-option 4a.

A European Digital Product Passport will allow consumers to access information more easily, further improving the benefits highlighted with regard to sub-option 4a. On the other hand, all companies, including SMEs, will benefit from the data on the parts they use as input to their process being delivered to them in a digital, standard format. This will increase the efficiency of their manufacturing processes and their reporting obligations, including under sub-option 4b. However, companies and associations consulted expressed a lack of capacity to properly anticipate direct economic benefits, as these will depend on the exact implementation, enforcement, and market reaction.

An important element for SMEs will be the language. Many SMEs prefer to work in their own language and are required to work in the language of their customers. The impact on SMEs

¹⁵⁰ DG SANTE, confidential information

may vary based on the language choices that will ultimately be made for the European Digital Product Passport system.

5.4.1.3. Indirect economic impact for businesses

The indirect economic impacts for businesses are the same as under sub-option 4a.

5.4.1.4.

The economic impact for citizens is the same as under sub-option 4a: they will access a wider set of information than is currently the case. However, the cost of products is likely to increase: depending on their willingness to pay more for more durable products, consumers will benefit to a lower or higher extent from the measure. The precise **Economic impact for citizens** magnitude of impact will therefore vary by type of products.

Additionally, the economic impact on citizens will vary depending on the ease of accessing and using information: if the cost of products increases but information is hard to access, citizens will be worse off. Sub-option 4b offers an improvement in this regard compare to sub-option 4a, as a European Digital Product Passport streamlines how information is stored and shared. These improvements will be further strengthened provided that information is available in citizen's preferred language. The final impact on citizens of sub-option 4b will therefore **vary based on the language choices that will ultimately be made for the European Digital Product Passport system.**

5.4.2. Environmental impact

Sub-option 4b includes all the measures of sub-option 4a and will therefore have the same kind of environmental impacts compared to the baseline.

More in detail, measure 4b.1 is expected to increase accessibility of information through the development of a European Digital Product Passport. Manufacturers will have to make available the required information through a unique identifier that users will employ to access information upon demand. In general, this is expected to reinforce the impact of the overall option. Along the value chains, operators will be able to access this information more easily, which is expected to help them improve their own production processes and procurements, and facilitate, for example, the work of businesses involved in maintenance, repair, re-manufacturing and recycling activities. Besides, consumers will also be able to find all the relevant information through a single entry point (e.g., a QR code), which should improve both their purchasing practices and their use of the product. The European Digital Product Passport is expected to operate as a decentralised dataspace, as opposed to a database hosted on centralised servers, as is the case for example for the EPREL Database. Concretely, for each individual item (or package of items sold collectively, such as a box of colour pencils) or for each batch of products placed on the EU internal market, a digital passport will be available as a data structure containing a unique identifier of the item (or package of items or batch) and a set of data relevant to that item (or package of items or batch). The nature of the data present on the European Digital Product Passport and the structure of this data is common to all items of the same product group. They may vary from one product group to the other, but the general intention is to maximise the elements of the structure that are common to all product groups¹⁵¹. In some products, such as electronics, dynamical data could be added, for instance, if the product has been maintained or repaired.

¹⁵¹ For further details, see the dedicated report prepared under Task 6 of this assignment

Measure 4b.2 will allow the information previously submitted to the SCIP Database to selectively become available through the European Digital Product Passport. That way, it will help achieve the objectives of improved information supply of the Waste Framework Directive and, indirectly, the REACH Regulation (Article 33), as well as increase the impact of the SPI requirements. Also, it increases the incentive to phase out substances of concerns, where possible, and mitigate the effect of those that cannot be replaced, thereby facilitating the work of recycling facilities, which will have access to information on the end-of-life management of the various products that contain substances of concerns. Both aspects of 4b.2 are instrumental in reinforcing the environmental effects of information requirements.

5.4.3. *Social impact*

The social impacts of sub-option 4b are of the same nature as those under sub-option 4a. However, the introduction of a European Digital Product Passport will intensify them. For instance, changes in the workforce are expected to be more considerable. Besides, the European Digital Product Passport will generate more significant benefits compared to sub-option 4a also with regard to social indicators, thanks to the increased salience of the information provided. As a result, the social impact in terms of workforce transition and working conditions will be higher.

Differently, sub-option 4b is expected to provide the highest efficiency to companies and to best mitigate the administrative burden; this should somewhat limit the impact on consumers in terms of increase in the product price.

5.5. **Sub-option 4c: Generalised European Digital Product Passport**

5.5.1. *Economic impact*

For sub-option 4c, the same stakeholders will be affected as for sub-option 4a and 4b.

5.5.1.1. **Administrative burden**

- Administrative burden for economic operators

Sub-option 4c intends to speed up the implementation of the PO by introducing horizontal requirements. To avoid a multiplication of existing information requirements (i.e. the requirements provided for by the REACH Regulation and Waste Framework Directive for all products containing substances of very high concern), the generalised European Digital Product Passport would progressively take over these existing information requirements, offering also an opportunity to improve the efficiency of the current REACH Regulation and Waste Framework Directive provisions. Nonetheless, the administrative burden for businesses is expected to be slightly higher than for sub-option 4b as companies will not be provided with product specific requirements.

Cost estimation

The use of a European Digital Product Passport by companies is expected to provide them with efficiencies in implementing the information requirements described under sub-option 4a. In addition, companies and industry associations were asked to estimate the cost of horizontal requirements. Based on their reply, sub-option 4c would result in an average administrative cost increase of 2.33%, compared to a 2.48% increase in 4a and 2.31% in 4b.

- Administrative costs for the European Commission

The definition of horizontal requirements is expected to be less work-intensive and therefore less costly compared to sub-options 4a and 4b. As for sub-option 4b, the European Commission will bear

the cost of setting up the European Digital Product Passport and will benefit from the same market intelligence to improve decision making in the future.

- Administrative burden for Member States

The administrative burden for Member States is the same as under sub-option 4b: not only will MSs benefit from the improvements expected under sub-option 4a, but they will also benefit from a European Digital Product Passport, as a powerful tool to easily access all necessary information and identify gaps in reporting.

5.5.1.2. **Direct economic impact for businesses**

The direct economic impacts for businesses are the same as under sub-option 4b. One the one hand direct costs will grow as a result of new requirements demanding new equipment and staff. The display of information will be facilitated by digital product passports, which will increase the benefits of showcasing companies' efforts in better products, providing sales arguments to sustainable companies. Easy access to manufacturing information will support the work of companies in the circular economy. However, companies and associations consulted expressed a lack of capacity to properly anticipate direct economic benefits, as these will depend on the exact implementation, enforcement, and market reaction. The impact on SMEs is rather similar to sub-option 4b.

5.5.1.3. **Indirect economic impact for businesses**

The indirect economic impacts for businesses are the same as under sub-option 4a and 4b. Sub-option 4c will encourage manufacturers to invest in more sustainable practices along the value chain, as observed following the introduction of past legislation on energy labelling¹⁵².

5.5.1.4. **Economic impact for citizens**

The economic impact for citizens is the same as under sub-options 4a and 4b: they will access a wider set of information than is currently the case. However, the cost of products is likely to increase: depending on their willingness to pay more for more durable products, consumers will benefit to a lower or higher extent from the measure. The precise magnitude of impact will therefore vary by type of products.

Additionally, the economic impact on citizens will vary depending on the ease of accessing and using information: if the cost of product increases but information is hard to access, citizens will be worse off. Sub-option 4b offers an improvement in this regard compared to 4a, as a European Digital Product Passport streamlines how information is stored and shared. These improvements will be further strengthened provided that information is available in citizen's preferred language. The final impact on citizens of sub-option 4c will therefore **vary based on the language choices that will ultimately be made for the European Digital Product Passport system.**

Horizontal requirements are not expected to lead to any additional change of impact for citizens compared to sub-option 4b.

5.5.2. *Environmental impact*

Sub-option 4c, similarly to 4b, includes all the measures of sub-option 4a and will therefore have the same kind of environmental impacts compared to the baseline.

¹⁵² JRC (2017), Boyano A., Moons H., Villanueva A., Graulich K., Rüdener I., Alborzi F., Hook I., Stamminger R., (2017) Eco-design and Energy Label for household dishwashers, EUR 28645 EN

More in detail, measure 4c.1 will introduce some “cross-sectoral” information obligations via horizontal requirements, leaving open the possibility to develop product-specific information requirements through secondary legislation. Similarly to sub-option 4b, this information will need to be displayed in the European Digital Product Passport. Those horizontal requirements can be introduced earlier and faster than product-specific or product-category specific requirements, as the guidelines relating to the information requirements will be prepared at a higher level and a lower number of requirements will need to be produced.

While the effects of information requirements on the value chains are incremental (one company improving its processes after having accessed the information of its suppliers, thereby updating its own information, etc.), horizontal requirements might provide positive environmental impacts earlier, thanks to a faster roll-out. However, many stakeholders (MSs and businesses alike) indicated the importance of the granularity of the requirements to ensure the overall quality of the legislation. They also emphasised that a progressive roll-out of the passport, starting from products with existing information requirements and then extending the scope, will ensure a better implementation. In that sense, the expected environmental gains of sub-option 4c might not materialise due to poorer implementation, and sub-option 4b seems fitter for purpose than sub-option 4c.

5.5.3. Social impact

The social impact of sub-option 4c is the same as that of sub-option 4b: the social impacts of sub-option 4c are of the same nature as those under sub-option 4a. However, the introduction of the European Digital Product Passport will intensify them. For instance, changes in the workforce are expected to be more considerable. Besides, the European Digital Product Passport will generate more significant benefits compared to sub-option 4a also with regard to social indicators, thanks to the increased salience of the information provided. As a result, the social impact in terms of workforce transition and working conditions will be higher. No specific impact resulting from horizontal requirements was identified either through consultation or desk research.

5.6. Impact on third countries

PO4 will impact the businesses of third countries, as they will need to provide the same information as EU businesses on the products they export to the EU. In the case of sub-option 4a, companies from countries that already have well-developed information systems (i.e., mature markets) might be advantaged. Similarly, under sub-option 4b and 4c companies from countries with more advanced digital markets might be advantaged.

5.7. Summary of impacts

Table 44 Administrative burden of PO4

| <i>Administrative burden Option 4</i> | | | | | |
|---------------------------------------|----------------|--|---|---|--------------------------|
| | | Businesses | | Administrations | |
| | | One-off | Recurrent | One-off | Recurrent |
| Sub-option 4a | Direct costs | -- Durability testing equipment in product design departments (shared with PO3) Connection between internal design and manufacturing ICT systems, and the standardised system making this information available to the relevant stakeholders under a standard format Setting-up of IT systems (home appliances) | -- Consolidation of the ecological profile based on inputs by suppliers Social impact auditing Personnel cost to comply with information obligations Personnel needed to keep data up-to-date Energy to run the system | -- Defining information requirements | - Compliance cost |
| | Indirect costs | n.a. | +/- Increased cost of products due to higher costs from suppliers' own reporting obligations Reduced cost of identifying suppliers thanks to better information Increased competition thanks to better information | n.a. | n.a. |

| | | | | | |
|-----------------------|----------------|---|---|--|---|
| -Sub-option 4b | Direct costs | -- Setting-up of ICT systems compatible with the European Digital Product Passport | --- Provision of information required in a digital format Consolidation of information based on inputs of suppliers | --- Supervising the set-up of the European Digital Product Passport | --- Guarantee of the functioning of the European Digital Product Passport Enable, as possible, the integration or coordination with the SCIP Database |
| | Indirect costs | n.a. | No new requirements compared to 4a | n.a. | n.a. |
| Sub-option 4c | Direct costs | No new requirements compared to 4a and 4b | +++ Provision of information required based on horizontal requirements | + (not cumulative with 4a) Definition of horizontal information requirements | No new requirements compared to 4a and 4b |
| | Indirect costs | n.a. | No new requirements compared to 4a and 4b | n.a. | n.a. |

Table 45 Economic impacts for PO4

| <i>Economic impacts</i> | | | | |
|---|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 4a</i> | <i>Option 4b</i> | <i>Option 4c</i> | |
| <i>Direct impacts</i> | | | | |
| Setting-up information sharing processes and regularly updating them augment costs | --- | -- | --- | <p>Companies see an increase in administrative burden and substantive obligations</p> <p>European Commission see an added regulatory cost, especially in setting up digital product passport</p> |
| The level and quality of information augment. Access becomes easier and less costly | ++ | +++ | ++ | <p>Companies can better showcase their sustainable practices</p> <p>Public authorities access better information to improve policy making</p> <p>Market surveillance becomes easier and the overall quality of products improves.</p> |
| <i>Indirect impacts</i> | | | | |
| Companies will benefit from lower cost of accessing information from suppliers | ++ | +++ | ++ | <p>Sectors in the circular economy (maintenance, repair, re-manufacturing, recycling) will particularly benefit from increased efficiency, lower costs and better quality of output.</p> <p>Manufacturers in general will benefit from cost decrease of performing LCAs and identifying suppliers.</p> <p>As cost decreases, pressure on products' price decreases as well, benefiting customers.</p> |

| | | | | |
|---|----------|-----------|-----------|--|
| <p>Companies invest in sustainable manufacturing processes (including design, logistics, supply chains, training, after-sale)</p> | <p>+</p> | <p>++</p> | <p>++</p> | <p>Costs of companies already engaged in the sustainable transition particularly benefit, as their current cost decrease.</p> <p>Companies that do not already engage in the sustainable transition receive a new incentive to do so, with added means through access to information.</p> <p>Overall, sustainable products become more mainstream.</p> |
| <p>Unit cost of products increases</p> | <p>-</p> | <p>--</p> | <p>--</p> | <p>In the short term, the added regulatory cost will drive a products' price increase. Consumers will face a higher up-front cost.</p> <p>In the short term, this might put vulnerable consumers at risk, which can be mitigated by the implementation of Circular Business Models (PO6).</p> <p>In the medium term, price increase associated with higher quality will drive a change in consumer behaviour.</p> <p>As companies access information that can lead to more efficient processes, the pressure on prices is also expected to diminish.</p> |

| | | | | |
|--------------------------------|---|----|----|---|
| Use value of products increase | + | ++ | ++ | <p>Procuring companies will benefit from better supplies, increasing the quality of their end products, and eventually save on production costs.</p> <p>Consumers will be able to compensate higher up-front prices with better value-for-money, lower Life-Cycle Costs and will engage in consumption practices that ensure long-lasting products.</p> |
|--------------------------------|---|----|----|---|

Table 46 Environmental impacts for PO4

| <i>Environmental impacts</i> | | | | |
|--|---------------------------|------------------|------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 4a</i> | <i>Option 4b</i> | <i>Option 4c</i> | |
| <i>Direct impacts</i> | | | | |
| The set-up of a digital infrastructure and the constant feeding and sharing of data generates negative environmental impacts | - | - | - | <p>4a could allow for a more case by case approach of what needs to be stored digitally, and how it is stored.</p> <p>However, 4b and 4c might allow for better efficiency and harmonised improvement of the overall structure</p> |
| Buyers choose more durable, reliable, and repairable products | + | ++ | + | <p>This concerns both companies as purchasers, public procurement and consumers.</p> <p>Access to information help buyers make more informed choices.</p> |

| | | | | |
|---|---|----|----|--|
| | | | | <p>Price increase related to regulatory burden provides an added incentive to buy the most reliable option.</p> <p>4b improves the accessibility of information provided under 4a.</p> <p>4c results in a faster implementation and higher ambition.</p> |
| Less sustainable options are driven out of the market | + | ++ | ++ | <p>Firstly, as buyers can better identify the most sustainable alternative, the demand for least sustainable options is expected to decrease.</p> <p>Secondly, as manufacturers can gradually improve their processes thanks to access to information, a number of products see their quality improving.</p> <p>The ambition increases thanks to both easier access (4b) or faster implementation (4c)</p> |

| | | | | |
|---|---|----|----|--|
| Substances of concern are gradually replaced by safer alternative | + | ++ | ++ | <p>Access to information will help highlighting the use that can be made of safer alternatives, helping in mainstreaming them.</p> <p>As consumers have a better access to information on substances of concern, demand for products with unnecessary use of these substances is expected to decrease.</p> |
| Better management of products containing substances of concern | + | ++ | ++ | <p>Integration of the SCIP directive (4b) is expected to make this process more efficient. Companies will have a direct access to SCIP information, supporting better management at the end-of-life. Other stages will also benefit from better access to information on what substances are present in a product.</p> |

| | | | | |
|--|---|----|----|---|
| More secondary materials are used in production | + | ++ | ++ | <p>Access to accurate data on the materials being recycled enables higher-purity sorting, and hence the production of higher-quality secondary metals, materials or plastics, at a lower cost. This improves the market position of secondary metals, materials or plastics vs. primary.</p> <p>Access to information will improve the visibility of the use of secondary materials, and provide useful information for manufacturers using them.</p> |
| <i>Indirect impacts</i> | | | | |
| Indirect environmental impacts associated with the production of new products are diminished as demand decreases | + | ++ | ++ | <p>Overall demand is expected to decrease due to longer lasting products and, to some extent, price pressure. Consumer behaviours are expected to become more sustainable. 4b and 4c aim at a higher overall impact.</p> |

| | | | | |
|--|---|----|----|--|
| Diminished release of harmful chemicals in the environment | + | ++ | ++ | Improved management of substance of concerns at all stages of the life-cycle thanks to better access to information is expected to reduce the release of these chemicals. This will especially help companies in avoiding those substances at production stage, and better managing their end-of-life. |
| Decreasing environmental impact of production of primary basic metals, materials and chemicals | + | ++ | ++ | As less products are produced, as more secondary raw materials are used, the production of primary basic metals, materials and chemicals is expected to decrease. |
| Decreasing environmental impact of material extraction | + | ++ | ++ | As less products are produced, as more secondary raw materials are used, material extraction is expected to decrease. |

Table 47 PO4 Social impacts

| <i>(2) Social impacts</i> | | | | |
|--|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 4a</i> | <i>Option 4b</i> | <i>Option 4c</i> | |
| <i>Direct impacts</i> | | | | |
| Increased incentive to improve working conditions by manufacturers | + | ++ | ++ | All options support this impact, and the digital product passport should result in higher impact. This will especially benefit workers in those value chains where scrutiny is not yet widespread, but it will also aim at improving the quality of reporting in sectors where this is already happening. |
| Vulnerable consumers face higher upfront cost of products | - | -- | -- | The increased cost of production will impact vulnerable consumers. However, the option is intended to also change consumption modes, and increase the use-value of products and reduce the Life-Cycle Cost of products. In the long term, this impact is expected to be moderate, specifically if Circular Business Models (PO6) are implemented. |
| <i>Indirect impacts</i> | | | | |
| Friction on the labour market as some sectors see increasing demand, while other decline | - | -- | -- | While this indirect effect is somewhat negative, it should be compensated by needs of new markets, as described below. |
| Companies invest in training and reskilling activities to address new demand | + | ++ | ++ | |

6. OPTION 5: REWARD MORE SUSTAINABLE PRODUCTS THROUGH INCENTIVES

6.1. Overview

Overview of Policy Option 5

Sub-option 5a: Enhanced incentives measures

- Measure 5a.1 – Member States are encouraged to introduce reputational and economic incentives, supported by the provision of guidelines
- Measure 5a.2 – Mandatory Green Public Procurement requirements in SPI product-specific rules

Sub-option 5b: Linking incentives to performance

This sub-option includes all measures in 5a, plus the following:

- Measure 5b.1 – Member States are obliged to use performance classes to introduce reputational and economic incentives
- Measure 5b.2 – Modulation of EPR fee according to the performance class

Sub-option 5c: Consumption-oriented incentives

This sub-option includes all measures in 5b, plus the following:

- Measure 5c.1 – Bonus for EU citizens to reduce their carbon footprint
- Measure 5c.2 – Introduction of an excise proportional to the life cycle environmental performance of the products placed on the EU market

6.1.1. Assumptions used in the analysis

- Sub-options have an aggregated effect in terms of the environmental, economic and social impact associated to sustainable products. This means that, although evidence is provided for specific reputational and economic incentives (e.g., eco-voucher, or green public procurement) or for a limited scope (e.g., MS, single product), there is a positive relation between the implementation of said policy measure and a positive effect on product sustainability.
- The information provided via the above measures is available to consumers and economic operators for a rational decision-making that makes sustainable products the preferred choice *ceteris paribus*. The hampering effects of asymmetric and/or imperfect information, although relevant, is considered not to be sufficiently significant to offset the positive effects of policy support to sustainable products. This is in line with the positive effect of existing measures such as Ecolabel and Energy Labelling¹⁵³.
- The improvement potentials for some product groups are consistent with the assumptions made for PO2. For product groups for which no information is available, assumptions of maximum improvement potentials are made. In general, an improvement potential of 5-10% was assumed conservatively across the different environmental impact categories for all product groups within the scope of the SPI. The notable exception is the energy savings potential, for which available evidence suggest an average improvement potential between 3 and 33% for ten different product groups attributable to the EU Energy Labelling.¹⁵⁴ Hence, the estimations have assumed an average improvement potential of 20%, which has been used for the product categories within the scope of the SPI.

¹⁵³ SWD(2017) 253 final, EMAS and Ecolabel Fitness Check

¹⁵⁴ Ecofys (2014) Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesing Directive. ENER/C3/2012-523. Ecofys, OKO Institut, Seven, Waite, SoWatt, University of Coimbra by order of the European Commission.

6.1.2. What problem and specific objective does this option address?

This policy option is intended to primarily address sub-problem 2 ('too difficult for economic operators and citizens to make sustainable choices in relation to products') by contributing – together with option 6 – to achieving the specific objectives 3 ('incentivise more sustainable products and business models to improve value retention'). It can also support the specific objective 1 ('improve product sustainability').

Stakeholders' views on PO5

As concerns sub-option 5a, economic and reputational incentives are perceived by SMEs as key tools to support the achievement of greater product sustainability: 70% of the respondents to the SME survey agree or strongly agree that regulations and incentives incentivise innovation in sustainable products. However, workshops results show a need to focus on improving incentives for circular design¹⁵⁵. Similarly, when asked how to increase compliance and enforcement, respondents to the consultation underline the need for accompanying measures from the European Commission to MSs, showing the need for guidance and harmonisation at the EU level.

Respondents to the targeted survey welcome the consideration of fiscal measures to incentivise circularity, including the removal of harmful subsidies; lower VAT for sustainable / circular goods / services (including repair services) / use of secondary raw materials / use of sustainable materials; tax on virgin / fossil materials; environmental impact tax; and tax shift from labour to resources.

Interviewed stakeholders indicate that they expect an administrative burden related to incentives to be limited. Similar messages are obtained from National Authorities responding to the open public consultation¹⁵⁶. A stakeholder survey with 80 responses from individual companies discloses that the yearly cost of their participation to initiatives¹⁵⁷ or of using specific methods¹⁵⁸ range between EUR 5,000 and EUR 2 million¹⁵⁹. This cost however represents an opportunity for companies, as:

- Close monitoring enables them to know precisely the strengths and weaknesses of their products¹⁶⁰;
- Obtaining a label is expected to be beneficial to their revenue as, beyond the reputational gain and competitive advantage¹⁶¹, it would qualify their products for other incentives (eco-voucher) and initiatives Green Public Procurement (GPP).

Respondents to the OPC rank 'improving access to finance', 'making better use of standardisation' and 'developing and implementing mandatory Green Public Procurement criteria and targets' as the three most important measures to encourage more sustainable production and consumption patterns. All main stakeholder groups (EU citizens, industry, NGOs and environmental groups) provided similar rankings, showing they jointly placed very high or high importance on the impacts of these measures. For SMEs,

¹⁵⁵ Workshop on Policy support for circular business models, May 2021

¹⁵⁶ Position papers (the Netherlands, Finland, and Denmark) within the OPC

¹⁵⁷ Initiatives based on commitments (e.g., UN Global Compact), reporting initiatives (e.g., Carbon Disclosure Project), indices (Dow Jones Sustainability Index), labelling initiatives (e.g., EU Ecolabel), initiatives by partnerships or platforms that are cross-sectoral (e.g., CE 100 network of the Ellen MacArthur Foundation) or sectoral (e.g., Sustainable Apparel Coalition)

¹⁵⁸ Standards (e.g., ISO 14040-44), other similar methods (e.g., Environmental footprint), methods underlying labelling (e.g., Swiss Ecolabel), certifications (e.g., Rainforest Alliance), reporting methods / organisation-level tools (e.g., UN Global Compact Indicators), rankings (e.g., SJSI Robecosam) and indicators internal to the company

¹⁵⁹ DG ENV 2020, Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods

¹⁶⁰ Ministère de l'Écologie, du Développement durable et de l'Énergie (2013), Bilan au parlement de l'expérimentation nationale, Affichage environnemental des produits de grande consommation

¹⁶¹ SWD(2017) 253 final, EMAS and Ecolabel Fitness Check

mandatory GPP criteria and targets are of relatively less importance. The lowest priority was given to 'better use and promotion of voluntary sustainability labels such as the EU Ecolabel', which is already widespread. A stakeholder survey shows that 97% of the individual businesses¹⁶².

A number of stakeholders are of the opinion that the main barrier for further uptake of circular products is not technical, but rather it is based on the fact that today the linear model is financially more attractive than manufacturing circular and sustainable products. According to SMEs, the main barriers to circular business models are the lack of a clear regulatory framework (65% score at least 4 out of 5, n=54) and the lack of consumer awareness and responsiveness to circular business models (62%, n=55). The main economic incentive to support sustainable products mentioned by stakeholders is green public procurement. The SME survey results indicate however that a majority would be unaffected (29%), not concerned (19%) or negatively affected (4%) if public authorities were required to purchase a minimum proportion of sustainable products in the total public procurement. The respondents to the consultation also wish that mandatory GPP standards would include sustainability, recycling, and social criteria.

Regarding the social impact of sub-option 5a, the respondents to the consultation underline the need for the legislator to take measures in support EU citizens to increase the level of awareness relating to the environmental, sanitary and social consequences of consumption patterns. Empowering consumers to make more sustainable choices and supporting communities through e.g., repair programs is highlighted by some stakeholders as important to achieve a more sustainable society.

As regards sub-option 5b, the respondents to the consultation indicate that it is paramount for certification to be affordable for SMEs, possibly through one-stop-shop solutions. They also underline the need for market and administrative barriers removal, as well as the need to align directives and regulations to remove the existing legal hurdles.

A large furniture manufacturer reported the complexity of communication about recycled content, and the needs of a case-by-case approach. Figures presented to the customer need to be reliable, but the intricacy of supply chains, the lack of material traceability and the recyclability variation from a material to another according to technological maturity and raw material costs hinder this accuracy. Rather than a precise figure, their preferred approach is to present a minimum level of recycled content. The same stakeholder recognises the interest to develop harmonised systems to monitor and communicate on environmental performances by product group, to assess the effect of this information on consumer behaviours, and to differ the mandatory implementation until the methodology is fully ready.

A furniture business organisation raised concerns about the costs and administrative burden that could be incurred by sub-option 5b, especially if a life-cycle analysis is required of each product placed on the market. Instead of having this burden on companies, it should be put on the sector, as a way to have accurate data to define appropriate and simple criteria. The same stakeholder indicated a strong support towards the harmonisation of EPR eco-modulation which would limit the burden associated to a diversity of approaches on modulation of EPR fees across MSs.

A textile business organisation recommended imposing eco-vouchers for consumers to purchase textile items that are second-hand, certified, repaired or rental.

The modulation of fees is ranked the fourth most important measure to encourage more sustainable production and consumption patterns in the OPC, again across all main stakeholders. Though, for SMEs, modulation of fees is considered the most effective. The majority of respondents are in favour of establishing a punitive scheme (such as the eco-modulation of fees) when rules / measures are not followed, though some stakeholders are in favour of positive incentives only. Some industry stakeholders

¹⁶² DG ENV 2020, Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods

are in support of setting-up an ambitious eco-modulation of fees in the EPR scheme, like the representatives of the French textile industry stated in a recent opinion paper published in *Le Monde*¹⁶³.

As for the social impact of sub-option 5a, the respondents to the consultation underline consumer education as a requirement in relation with mandatory label requirements, including an easy non-compliance reporting system.

As regards sub-option 5c, policy support for circular economy by a dedicated tax regime (e.g., introducing a tax on virgin material) is identified as the second most important barrier for the further uptake of circular products by the respondents to the consultation. This issue is also challenged by stakeholders. In the targeted stakeholder survey, the introduction of an excise duty proportional to the product life cycle environmental footprint receives 40% of positive opinions for achieving greater sustainability, while 27% of respondents expressed negative opinions.

6.2. Baseline for PO5

In the absence of SPI, the EU and MSs will continue promoting sustainable products, services and businesses through EU instruments such as the EU Ecolabel, the Energy Label and the application of EU Green Public Procurement criteria. MSs will also continue to introduce measures on the national level. This would include the introduction of fee modulation in extended producer responsibility (EPR) schemes (as required under Article 8a of the Waste Framework Directive), tax incentives (e.g., reduced VAT on small repairs in accordance with the VAT Directive) and the introduction of national labelling schemes (e.g., the Nordic Ecolabel). The Baseline assessment will consider all these policy instruments and assume that the provisions will not change before 2030. It will also assume that the existing success and challenges associated with the efficiency of these instruments might persist if no additional measures are taken. It will also be assumed that overall trends with regards to the market uptake of sustainable products seen until now will sustain a future “No-SPI” scenario.

In the absence of SPI, the existing instruments will continue to deliver certain positive impacts in terms of providing a market push towards more sustainable and circular products.

The EU Ecolabel is a voluntary labelling scheme which was established in 1992 by the European Commission. Its application has been expanding product coverage and generating visible impact on consumer choices. The EU Ecolabel has helped to streamline national initiatives on ecolabelling, and many MSs have integrated their labels with the EU Ecolabel¹⁶⁴. The CEAP recognizes the valuable role of EU Ecolabel criteria to inspire mandatory legislation and prescribes the systematic inclusion of circular economy aspects in the EU Ecolabel criteria. It has also supported *green procurement* in many countries. The EU Ecolabel will continue being active irrespectively of SPI. However, in the last few years its uptake has been hindered by significant obstacles such as competition with other green labels and the administrative burden associated with its application¹⁶⁵.

¹⁶³ « Nous, marques textiles, demandons à être plus régulées », 7th July 2021, https://www.lemonde.fr/idees/article/2021/07/07/nous-marques-textiles-demandons-a-etre-plus-regulees_6087296_3232.html

¹⁶⁴ Lange P. (2014) The coexistence of two Ecolabels: – The Nordic Ecolabel and the EU Ecolabel, Nordic Council of Ministers, 5 may 2014

¹⁶⁵ Prieto-Sandoval, V., Mejia-Villa, A., Ormazabal, M. et al. Challenges for ecolabeling growth: lessons from the EU Ecolabel in Spain. *Int J Life Cycle Assess* 25, 856–867 (2020). <https://doi.org/10.1007/s11367-019-01611-z>

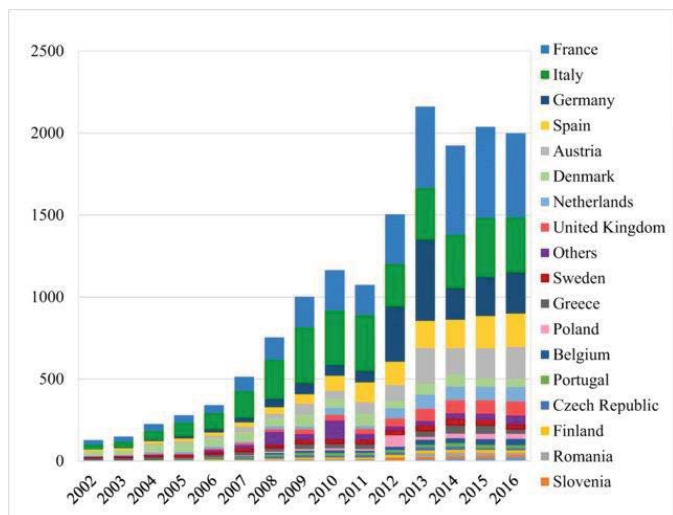


Figure 1 Evolution in EU Ecolabel licenses since 2002

Source: Prieto-Sandoval et al (2020) based on data from the EC

The latest Ecolabel Fitness check¹⁶⁶ has confirmed the relevance and positive role of the instrument in reducing the environmental impact of consumption and production. However, it highlighted that the contribution is limited compared to the overall breadth of the challenges to be addressed with total consumption and production. Under the EU Ecolabel a number of product groups have no or marginal uptake indicating that the market is immature and/or that the administrative burden or verification cost for compliance with certain set of criteria may be too high and act as a barrier for participation. At the same time, the EU Ecolabel operates in a context of general public support for sustainable production and consumption: 77% of the EU population surveyed through the Eurobarometer indicated that they are willing to pay more for environmentally-friendly products if they feel that the claims can be trusted¹⁶⁷. According to the 2020-2024 EU Ecolabel Work Plan, the Ecolabel product portfolio will continue to expand. The further refinement of circularity aspects might be taking place as well. As discussed in the baseline for PO4, the integration of the PEF approach in the Ecolabel methodology will further extend the latter's positive impact and increase the endorsement from consumers and procurers.

The positive impacts of the **Energy label** introduced through the Energy Labelling regulation can be associated with the impact of the respective products to which the label is applied (see also environmental, social and economic impacts presented in the baseline for PO2). As a communication tool, it incentivizes sustainable consumer behaviour by making energy efficient products more attractive. It can also incentivise the green procurement of products in public procurement tenders.

Green Public Procurement (GPP): under the Baseline, it will remain a voluntary instrument meaning that it is up to the MSs and their contracting authorities to implement it. In this context, the EU GPP criteria sets developed by the European Commission for 20+ priority products are non-binding and not formally adopted as a legal act. At the same time, the European Commission

¹⁶⁶ SWD (2017) 252 final. FITNESS CHECK REPORT on the review of implementation of Regulation (EC)No 122/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS) and the Regulation (EC) No 66/2010 of the parliament and of the Council of 25 November 2009 on the EU Ecolabel

¹⁶⁷ Special Eurobarometer 468: Attitudes of European citizens towards the environment - Data Europa EU

encourages MSs to take further steps to apply green procurement criteria to at least 50 % of public tenders. In addition, with the promotion of Just Transition actions the Commission encourages to increase the uptake of socially-responsible criteria in public procurement to support social inclusion via public investments. While comprehensive monitoring on GPP in MSs is missing, selected countries report on their GPP performance. For example, the Swedish Competition Authority found that more than 90% of procurement in Sweden has sustainability criteria included in the contracts, while the percentage reported for the Netherlands is 91%¹⁶⁸. In Germany and the Netherlands, several cities are promoting the leasing of services and product-as-a-service models (e.g., computer equipment and furniture).¹⁶⁹ The French procurement law establishes a target of 20% of refurbished products in public purchases. France also includes environmental performance targets for large-scale renewable energy installations (e.g., performance targets based on the embodied carbon content of solar photovoltaic panels used in large-scale installations).¹⁷⁰ The latter has been leading to the purchase of the best environmentally-performing product in the market by installers, and fostered competition between original product manufacturers to improve the environmental performance of solar PV modules. At the international level, the European Commission can use the ongoing dialogue in the Committee implementing the WTO's revised Government Procurement Agreement (GPA) to encourage strategic partners and third countries to strengthen sustainable products procurement.

Although a considerable adoption of GPP criteria is observed as described above, its current overall uptake demonstrates a clear potential for improvement due to significant variations in the adoption of GPP criteria across Member States and product groups¹⁷¹. Improved clarity on relevant legislative provisions on GPP and the introduction of mandatory elements (as opposed to the current voluntary nature of the instrument) could increase its uptake¹⁷². There are many potential benefits to harmonising green public procurement for products. Harmonising criteria used by MSs ensures the functioning of the internal market, improves EU-wide competition, and reduces the administrative burden for economic operators and authorities.

As regards circular procurement, the OECD in their 2014 survey studied MSs practices and challenges associated with this approach¹⁷³. As seen in the table below, the awareness of procurement and its potential to contribute to a more circular economy is the key challenge for many MSs (yellow). Capacity building, evidence, and practical guidance on how to implement more circular procurement are the main challenges for countries already familiar with circular economy principles (turquoise). The biggest challenge for those few countries (lavender) that have launched pilot projects to implement circular procurement is how to scale them up at a mainstream level.

¹⁶⁸ Ministry of Economic Affairs and Climate Policy (2021) Public Procurement Monitoring Report of the Netherlands

¹⁶⁹ Norden (2021) Sustainable procurement for the SDGs; Dalhammar et al (2016) Sustainable Procurement of PSS – the case of furniture. *Journal of Cleaner Production*.

¹⁷⁰ Republique Francaise (2021). Cahier des charges de l'appel d'offres portant sur la réalisation et l'exploitation d'Installations de production d'électricité à partir de l'énergie solaire « Centrales au sol ».

¹⁷¹ Centre for European Policy Studies and College of Europe (2012), the Uptake of Green Public Procurement in the EU27.

¹⁷² Poukli K. (2020) Towards mandatory Green Public Procurement (GPP) requirements under the EU Green Deal: reconsidering the role of public procurement as an environmental policy tool. *ERA Forum* (2021) 21:699–721. <https://doi.org/10.1007/s12027-020-00635-5>

¹⁷³ EP (2017). Green Public Procurement and the EU Action Plan for the Circular Economy. Study prepared by Policy Department Economic and Scientific Policy European Parliament for ENVI Committee. Available at: [http://www.europarl.europa.eu/RegData/etudes/STUD/2017/602065/IPOL_STU\(2017\)602065_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2017/602065/IPOL_STU(2017)602065_EN.pdf)

Table 48 Summary of respondents' views on Member States and circular procurement

| | Lavender | Turquoise | Yellow |
|-------------------------|---|--|--|
| Definition | <i>Actively embedding (circular) procurement practice in policies for delivering the Circular Economy</i> | <i>Aware of possible alternatives, some evidence of individual examples but no systematic approach to linking procurement and the Circular Economy</i> | <i>Not aware beyond the barriers to the Circular Economy</i> |
| Countries | Finland, Netherlands, Belgium (Flanders specifically), France, UK (Scotland specifically) | Sweden, Denmark, Italy, Spain, Germany, Austria; UK (England); Belgium; Latvia; Malta | Romania, Lithuania, Slovak Republic, Poland, Bulgaria, Czech Republic, Portugal, Hungary |
| Major challenges | Legal; financial; inertia | Linking procurement to CE; lack of training in alternative approaches; verification (e.g. of LCC) | Lack of awareness/evidence; low recognition of BPQR; active legal challenges to BPQR |

Extended producer responsibility (EPR) schemes have long been implemented across all MSs. Some MSs have included aspects of fee modulation and Ecodesign aspects of waste prevention in their EPR legislation. EPR schemes are implemented by MSs following the principles included in Article 8 and 8a of the Waste Framework Directive (2008/98/EC). The same is also mandated by the ELV Directive, the WEEE Directive, the Batteries Directive, and the Packaging and Packaging Waste Directive¹⁷⁴. A number of new EPR schemes for additional product categories have been or are to be implemented at the national level.

For example, Ireland has established EPR schemes for agricultural plastics and tyres and has plans to implement EPR for textiles. France has already adopted an EPR scheme for textile waste, as well as for pleasure boats, furniture and mobile homes. Similarly, Sweden and the Netherlands assessed the possibility for implementation of mandatory EPR system for textile products.

EPR for packaging has contributed to significant increases in recycling rates in the EU. This applies also to plastic packaging, where recycling reached on average 40% in 2015, which is well above the required 22.5% of the EU Packaging and Packaging Waste Directive.

¹⁷⁴ Note for instance art 7(2) of the PPWD: *Member States shall ensure that, by 31 December of 2024, extended producer responsibility schemes are established for all packaging in accordance with Articles 8 and 8a of Directive 2008/98/EC*. Also SUPD Article 8 is dedicated to EPR and the SUP items in question are to a large extent packaging.

| Country | Packaging | WEEE | ELV | Agricultural plastic | Other |
|----------------|-----------|------|-----|----------------------|---|
| Austria | ✓ | ✓ | ✓ | | <i>Plastic foils and bulky plastics</i> |
| Belgium | ✓ | ✓ | ✓ | ✓ | <i>Disposable plastic kitchenware</i> |
| Bulgaria | ✓ | ✓ | ✓ | | |
| Croatia | ✓ | ✓ | ✓ | | |
| Cyprus | ✓ | ✓ | ✓ | | |
| Czech Republic | ✓ | ✓ | ✓ | | |
| Denmark | ρ | ✓ | ✓ | | |
| Estonia | ✓ | ✓ | tb | | |
| Finland | ✓ | ✓ | ✓ | ✓ | |
| France | ✓ | ✓ | ✓ | ✓ | <i>Textile, pesticide, fertilizer, seed and plant packaging, furniture and office equipment, ink cartridges</i> |
| Germany | ✓ | ✓ | tb | ✓ | |
| Greece | ✓ | ✓ | ✓ | | |
| Hungary | ✓ | ✓ | ✓ | | |
| Ireland | ✓ | ✓ | ✓ | ✓ | |
| Italy | ✓ | ✓ | ✓ | ✓ | |
| Latvia | ✓ | ✓ | ✓ | | |
| Lithuania | ✓ | ✓ | ✓ | | |
| Luxemburg | ✓ | ✓ | ✓ | | |
| Malta | ✓ | ✓ | N/A | | |
| Netherlands | ✓ | ✓ | ✓ | | <i>Window panes</i> |
| Poland | ✓ | ✓ | ✓ | | |
| Portugal | ✓ | ✓ | ✓ | | <i>Medical and pharmaceutical packaging</i> |
| Romania | ✓ | ✓ | tb | | |
| Slovakia | ✓ | ✓ | ✓ | | |
| Slovenia | ✓ | ✓ | ✓ | | |
| Spain | ✓ | ✓ | ✓ | ✓ | |
| Sweden | ✓ | ✓ | ✓ | ✓ | |
| United Kingdom | ✓ | ✓ | ✓ | | |

✓ - EPR scheme; tb - takeback obligation, no PRO; ρ-product fee obligation/governmental fund. Source: [European Commission, 2014](#).

Figure 2 EPR schemes in EU Member States

The EPR instrument is aimed at shifting the responsibility of waste management to producers and to give an incentive to invest in sustainable product design. Although EPR schemes have proven to be successful in achieving the first objective by organising separate collection and treatment of end-of-life products, the extent to which it incentivises sustainable product design has proven to be limited. In particular when uniform (rather than modulated) financial contributions are applied in the case of collective EPR schemes, these incentives are weak¹⁷⁵.

VAT differentiation can be an effective mechanism to stimulate sustainable products markets in Europe.¹⁷⁶ The use of pricing mechanisms promoting reparability and product life extension are increasing among MSs in terms of scope and level of ambition. For instance, differentiated taxation for the purchase of more sustainable alternatives is used to support sustainably sourced materials, efficient and cleaner production, repair, high-quality recycling, etc. Tax breaks are in place for the repair of a large number of products in Sweden, whereas France provides financial aid in the form of vouchers for the repair of bicycles or the purchase of electric bicycles (see also additional examples in measure 5b.2).¹⁷⁷ While these instruments can provide incentives for the sustainable consumption and repair of products, they are not introduced consistently across the internal market. In addition, the possibilities to further extend the introduction of financial incentives through VAT reductions or exemptions is limited within the scope of the VAT Directive (2006/112/EC), which for instance only allows tax reductions in services offering minor repairs of certain products.¹⁷⁸

In the business-as-usual scenario, it can be expected that the impact of the EU Ecolabel will continue to expand with the extension of the product portfolio and the integration of the PEF

¹⁷⁵ see e.g. OECD 2016, Incentives for eco-design in extended producer responsibility

¹⁷⁶ Oosterhuis, F. et. al. (2008)

¹⁷⁷ With the “Coup de pouce réparation”, the French government provided a EUR 50 bonus per bike to cover the cost of repairs until March 31, 2021. It also provides a bonus, of a maximum of EUR 200, for the purchase of a new electric bicycle.

¹⁷⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0112&from=EN>

approach. The positive trends observed in the application of GPP in MSs are expected to continue, although variations in the adoption of GPP criteria across MSs will limit the impact of the instrument. No further significant changes are expected in the adoption and implementation of other EU instruments promoting reputational and economic incentives. The challenges discussed above are likely to persist, while some progress could be expected in selected MSs. The benefits associated with these instruments is difficult to quantify, but a certain demand for greener products and market uptake will be facilitated.

6.3. Sub-option 5a: Enhanced incentives measures

6.3.1. Economic impacts

Measure 5a.1 will not directly result in additional economic impacts, as it will be limited to the provision of guidelines to support public authorities in MSs with the introduction of reputational and economic incentives at the national level. The economic incentives themselves may result in additional economic impacts, however it is not possible at this stage to estimate their overall impact as this depends on the actual incentives on which guidance will be provided and the product categories to which these incentives apply.

Measure 5a.2 will allow the Commission to develop mandatory GPP criteria. Underpinning work is to be undertaken on a product-by-product basis in the context of SPI measures. Product-specific GPP criteria will be subject to an Impact Assessment process. As such the economic impact of the instrument overall is difficult to assess, although this is likely to increase and be positive as the instrument departs from the current voluntary nature of GPP. Existing GPP schemes have been found to be often associated with economic savings over the entire life cycle of the purchase of a product for public authorities, and society more broadly, through reduced use and improved efficiency of resources¹⁷⁹. By sustaining demand for “greener” products, public procurement creates markets for environmentally friendly products and services. Depending on the product group, GPP can provide a competitive advantage to suppliers of sustainable products.

6.3.1.1. Administrative burden

Administrative burden for economic operators

Measure 5a.1 will not directly result in an additional administrative burden for economic operators as it will be limited to the provision of guidelines to support public authorities in MSs with the introduction of reputational and economic incentives at the national level. The actual impact on economic operators depends on if and how guidance provided by the European Commission is put into practice by public authorities in MSs, as well as the specificities of the guidance in terms of types of incentives and product categories to which these apply.

GPP typically requires manufacturers to produce the information necessary to certify that their products meet the necessary requirements, as well as all operators along the value chain to keep the associated records and documents. Furthermore, such a measure could lead to additional burdens for companies, such as:

- Monitoring process and costs related to the collection and tracking of information on a large scale¹⁸⁰; and
- Third-party verification of the product (NB: third-party verification costs linked to EU requirements are assessed under Option 7).

¹⁷⁹ Economic and reputational incentives and support measures for sustainable products - Task 4 report of this Impact assessment

¹⁸⁰ Ministère de l'Écologie, du Développement durable et de l'Énergie (2013), Bilan au parlement de l'expérimentation nationale, Affichage environnemental des produits de grande consommation

Administrative costs for the European Commission

Measure 5a.1 will generate costs for the EC associated with the development of guidelines. These costs are expected to remain limited.

As concerns measure 5a.2, the administrative costs for the European Commission will be linked to drafting the legislative measure, its supporting guidelines and tools for the implementation of GPP in MSs. A dedicated GPP helpdesk has already been set up by the European Commission in 2010¹⁸¹. Consequently, the costs for measure 5a.2 are also expected to remain limited, though higher than for measure 5a.1¹⁸².

Administrative burden for Member States

The implementation of sub-option 5a.1 will generate an administrative burden for public authorities, in particular because of the need to monitor and enforce compliance with the new incentives, although this does depend on if and how MSs choose to put EU guidelines into practice. Certain savings could also be expected. For instance, incentivizing economic operators to use standardisation and labelling will ease the work of civil servants as the use of enforceable criteria for consumer information on environmental characteristics will be easier to control than the fairness of general business orientations¹⁸³.

As concerns measure 5a.2, experiences show that GPP implementation costs can benefit from reputational incentives. For instance, in Korea, GPP benefited from the existing green criteria of the Korea Eco-label and Green Recycled Mark and from the implementation of an online platform, the Green Products Information System (GPIS), to ease the monitoring and reporting process. Similar lessons were drawn in China, the Netherlands¹⁸⁴, Sweden¹⁸⁵ or the city of Vienna¹⁸⁶, where the use of common monitoring and impact measurement tools and standards have supported GPP uptake from contracting authorities. Furthermore, the use of a common EU approach can reduce fragmentation and misalignments in estimating the impact of GPP in each country. Nevertheless, the implementation of GPP requires training in evaluating life cycle cost for public officers¹⁸⁷.

6.3.1.2. Other economic impacts for Member States

Although voluntary at this stage, MSs will be encouraged to set up incentives, which can have impacts on public finances. Environmental taxation is a behavioural transformation tool, with a potential to transform the economy, thus leading to imbalances¹⁸⁸. It could lead to an immediate increase of the public budget (with a decrease over time as behaviours are modified), or on the contrary, to fiscal revenue decrease (e.g., reduced VAT). For instance, by introducing a reduced VAT rate, Austria reduced the amount of repair-related tax collected, although it will partially be

¹⁸¹ Helpdesk for GPP, <https://ec.europa.eu/environment/gpp/helpdesk.htm>

¹⁸² In addition, the European Commission suggested setting up a compulsory reporting to monitor the uptake of Green Public Procurement (GPP), without further defining the resources required. Cf. COM(2020) 98 A new Circular Economy Action Plan for a cleaner and more competitive Europe

¹⁸³ Ex ante impact assessment of the French AGECE Law (2019). <https://www.senat.fr/leg/etudes-impact/pil18-660-ei/pil18-660-ei.html>

¹⁸⁴ OECD 2015, Going Green: Best Practices for Sustainable Procurement

¹⁸⁵ Konkrensverket 2018, The Swedish procurement monitoring report

¹⁸⁶ ConPlusUltra 2014, Green Public Procurement in the City of Vienna Impact Analysis

¹⁸⁷ Hasanbeigi, A., Becque, R., Springer, C. 2019. Curbing Carbon from Consumption: The role of Green Public Procurement.

¹⁸⁸ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

compensated by an increase in demand¹⁸⁹. Another example is the Belgian eco-voucher that has been found to support the domestic consumption and job market, as it must be used within the country¹⁹⁰. If the eco-vouchers were replaced by an equivalent net amount, Belgium would lose EUR 50 millions of direct and indirect domestic consumptions and 1,300 jobs. Yet, both of them are beneficial to the government as they generate revenue, and employment reduces the need for unemployment allowance. One last example is the implementation of the bonus/malus scheme in France, which resulted in budget imbalance in the first years due to the stronger than expected interest from both consumers and producers. In 2009, the deficit reached EUR 625 million. Corrections were applied, which led to a tax benefit of EUR 45.8 million in 2012¹⁹¹. With the shift of the bonus/malus scheme in 2019 to target more specifically low-income households and those that depend on their vehicle for their livelihood, it was found that it generates indirect benefits, in particular social benefits, that could offset the opportunity cost of public funds associated with the use of public money¹⁹². Even without the quantification of those indirect benefits, the direct benefits associated to this incentive (lesser environmental impact, economic savings of citizens) surpass the associated economic burden (amount of bonuses distributed): in 2019, there was an overall gain of EUR 610 million for the community.

The procurement of green products may result in economic advantages. Studies show that green products can have a lower purchasing price, due to a smaller amount of resources and/or waste generated, which can lead to lower associated production costs. In the European Union, the purchasing cost of green copying paper was found to be similar to non-green copying paper and even cheaper in some MSs (-23% in Germany)¹⁹³. The use of an (environmental) life cycle costing approach could even decrease the costs associated with the purchased solution. Another study concluded that the average financial impact of GPP was -1.2%, thus leading to cost reductions for public authorities using GPP. In Austria, results show that the implementation of the ÖkoKauf (EcoBuy) programme in the city of Vienna resulted in savings of EUR 17 million annually¹⁹⁴, resulting from the purchase of various products groups, ranging from organic food to cleaning products, vehicles or lighting bulbs. It should be pointed out that this number varies from a product group to another¹⁹⁵. For instance, procurement of green textiles or 100% electricity supplied from Renewable Energy Sources (RES-E) can lead to non-negligible increases in costs.

6.3.1.3. Direct economic impact for businesses

Many different incentives are possible, and target various types of stakeholders, from consumers to producers through retailers. Incentives create opportunities to strengthen the market for sustainable products, as companies are encouraged to develop and sell new and less environmentally-impacting products. The measures under sub-option 5a should be designed as non-discriminatory.

Guidelines introduced under measure 5a.1 are not expected to have direct impacts on companies and will not directly affect their competitiveness. Indirectly, however, the introduction of

¹⁸⁹ Austrian Institute for Economic Research (2019), “ Effekte eines ermäßigten Mehrwertsteuersatzes für Reparaturdienstleistungen

¹⁹⁰ Roland Berger 2017, « Les avantages du système des éco-chèques par rapport à un montant net équivalent – Analyse d’impact pour les pouvoirs publics »

¹⁹¹ Commissariat général au développement durable 2013, Évaluation économique du dispositif d’écopastille sur la période 2008-2012

¹⁹² French Ministry of Ecological Transition (2021), “Prime à la conversion des véhicules particuliers en 2019: bilan socio-économique”

¹⁹³ Öko-Institut, ICLEI 2007 for DG ENV, Costs and Benefits of Green Public Procurement in Europe

¹⁹⁴ OECD 2015, Going Green: Best Practices for Sustainable Procurement

¹⁹⁵ Collection of statistical information on Green Public Procurement in the EU 2009

incentives by Member States, such as environmental taxes, may affect the relative competitive position of companies. For instance:

- **Revenue increase due to higher demand.** Differentiated taxation, GPP and eco-vouchers are all instruments that contribute to increasing the demand for sustainable products and services, which positively impacts the revenues of companies providing them (associated with reputational gain)¹⁹⁶;
- **Impacts on profits.** Changing the sustainability of products or new / higher environmental taxes may increase production costs. This may result in lower profits if prices do not keep up, e.g., in case a full pass-through of environmental taxes to the consumer is not possible. The empirical evidence indeed shows that, although situations are highly variable across industries, a 100% pass-through of costs to prices is unlikely¹⁹⁷;
- **Investments.** To produce more sustainable alternatives and, for instance, reduce the amount of environmental taxes paid, the measures will also encourage manufacturers to invest in more sustainable manufacturing processes, logistics and supply chains (including training), in the design phase of industrial products, in industrial engineering (design of production processes), purchasing departments and logistics¹⁹⁸; and
- **Business models.** Incentives can also foster the development of circular business models (policy option 6): differentiated taxation, for instance, is an instrument that can support repair and reuse, and the shift towards recycled material¹⁹⁹.

Measure 5a.2 is expected to have positive direct economic impacts on companies offering sustainable products and on contracting public authorities. By sustaining demand for “greener” products, public procurement creates markets for environmentally-friendly products and services. It also provides incentives for companies to develop innovative solutions with lower environmental impacts²⁰⁰, creating markets and jobs²⁰¹, notably for SMEs²⁰². Depending on the product group, green public procurement can provide a competitive advantage to environmentally-aware suppliers²⁰³.

Capital expenditures are expected to increase significantly because of the efforts required to produce products eligible for Green Public Procurement²⁰⁴. Operational expenditures are also expected to rise, less so than capital expenditures, as specific staff would be needed to ensure the fulfillment of the requirements (research, product and production technology development,

¹⁹⁶ DG ENV 2020, Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods

¹⁹⁷ RBB Economics (2014), Cost pass-through: theory, measurement, and potential policy implications

¹⁹⁸ JRC (2017), Boyano A., Moons H., Villanueva A., Graulich K., Rüdener I., Alborzi F., Hook I., Stammering R., (2017) Ecodesign and Energy Label for household dishwashers, EUR 28645 EN

¹⁹⁹ European Topic Centre on Waste and Materials in a Green Economy 2021, Business models in a circular economy

²⁰⁰ COM(2008) 400 final

²⁰¹ Umweltbundesamt, Green public procurement, <https://www.umweltbundesamt.de/en/topics/economics-consumption/green-public-procurement#strap-14572>

²⁰² Irish Department of the Environment, Climate and Communications 2021, Green Tenders - an Action Plan on Green Public Procurement

²⁰³

For example, the City of Lille procured in 2003/2004 the management and the maintenance of a new energy-efficient lighting system (300 control boxes and 22 000 lighting units). The selected tenderer managed to win several similar contracts in neighbouring municipalities, and competitors soon replicated its strategy to focus on energy efficiency and environmental performance. It allowed to save 32 to 35% of its energy, and financial gains were reinvested primarily in the development of new environmental technologies, products and services, to achieve a 40% decrease. It also allowed to lower the public budget for public lighting by 5%. The old lighting system was made more energy efficient and transferred to a twinning town in Senegal, alongside skills transfer.

²⁰⁴ Stakeholder consultation, October 2021

testing and quality assurance, after sales service and after sales service support, management system operators, purchasing departments, etc.). However, those increased expenditures could also benefit the other policy options of the SPI, which would limit their overall magnitude.

6.3.1.4. Indirect economic impact for businesses

Measures 5a.1 and 5a.2 are expected to have positive indirect economic impacts. The introduction of incentives will indeed support higher activities in product testing, repair or recycling activities. Reputational incentives, which could foster GPP²⁰⁵, have the potential to generate knowledge spill-overs, to bring strong positive network effects (e.g., services based on information and communication technologies through an increase of interoperability), and to contribute to generate trust, especially among early adopters of risky innovative products²⁰⁶.

6.3.1.5. Economic impact for citizens

The guidelines developed under measure 5a.1 will not lead to direct impacts for citizens. Depending on if and how MSs choose to implement the EU guidelines on incentives, there could be an indirect impact. For some products, evidence shows that the introduction of incentive schemes can lead not only to immediate reduction of operational costs (for instance due to reduced energy consumption as a result of the energy label), but also to the decrease of investment costs in the medium term, with prices lower than forecast²⁰⁷. For instance, with the shift of the French bonus/malus scheme in 2019 to target more specifically low-income households and those that depend on their vehicle for their livelihood, 341,000 bonuses were provided in 2019²⁰⁸. In that same year, the scheme led to savings in terms of gas (EUR 117 million) and car maintenance (EUR 81 million) and benefits in terms of improved efficiency, that surpassed the associated costs of purchasing a new vehicle.

The change in demand fosters the number of sustainable options available and sold every year on the markets, resulting in a need for less products. For eco-vouchers, although it is difficult to quantify, literature acknowledged effects on environmental awareness²⁰⁹, which can have a multiplying effect on consumption choices.

However, some incentives are likely to increase prices if manufacturers transfer, partially or fully, the cost to the consumers (e.g., taxation, third-party verification and registration costs for labels, EPR fees). In the literature, the breadth of this transfer varies widely from one instrument to another and depends on contextual elements²¹⁰.

GPP has the potential to generate procurement savings from public authorities, either through lower purchasing costs, operating costs or increased product life-expectancy²¹¹. These savings could contribute to reduce public spending and positively impact citizens.

6.3.2. *Environmental impacts*

The possible introduction and deployment of economic and reputational incentives following EU guidelines and the mandatory requirements to implement GPP will generate positive

²⁰⁵ Environmental impact for option 5a

²⁰⁶ Sant'Anna School of Advanced Studies and Öko-Institut on behalf of DG ENV 2020, Identification of elements for a future Strategy for the EU Ecolabel

²⁰⁷ Ellis M and al. 2007, Do energy efficient appliances cost more?

²⁰⁸ French Ministry of Ecological Transition (2021), "Prime à la conversion des véhicules particuliers en 2019: bilan socio-économique"

²⁰⁹ CO2logic 2019, Evaluation de l'impact climatique associé à l'utilisation d'éco-chèques en Belgique

²¹⁰ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

²¹¹ Interview with stakeholder, April 2021.

environmental impacts compared to the baseline scenario. In some cases, for instance with eco-vouchers²¹², the deployment of incentives could however generate unintended environmental consequences, e.g., a rebound effect, with the increase of sustainable product consumption instead of the unique direct replacement of unsustainable products. However, the overall balance is expected to be positive.

The guidelines under measure 5a.1 can lead to positive environmental effects due to the introduction of incentives by MSs that incentivise a greater selection of more sustainable products by consumers and the development of more sustainable offers by producers (e.g., increased product recyclability linked to eco-modulation according to SPI product performance classes).

The examples below show the potential environmental benefits of certain reputational and economic incentives:

- The updated EU Waste Framework Directive recommends MSs to use “fiscal measures or other means to promote the uptake of products and materials that are prepared for re-use or recycled”²¹³. In Austria, following some regional initiatives, the implementation in January 2021 of a tax relief for “*small repair services and the sale of repaired products*” is the first Austrian national legislation to address reparability, with a VAT reduction from 10% to 20% for certain repair services. The measure will incentivise repairs, reducing the overall number of products on the market and strengthening repair companies²¹⁴.
- The Belgian eco-voucher scheme generated average CO₂ emission savings of 1 kgCO₂eq per EUR spent²¹⁵. Overall, the use of eco-vouchers has saved the equivalent of 0.23% of Belgium’s total annual CO₂ emissions in 2017 and 2018 (216,665 tCO₂eq and 229,797 tCO₂eq respectively), with a societal cost of EUR 21 to 42 million. The incentive to purchase products with a longer lifespan and use generally resulted in a greater reduction in terms of environmental impact than consumer goods: electro / multimedia and renovation / construction categories enabled for 31% and 24% of CO₂ reductions respectively, while they accounted for 38% and 4% of the amounts spent through eco-vouchers. The study also acknowledged the potential positive impacts on biodiversity and on water and soil quality.

Still, economic incentives such as the eco-voucher may cause a rebound effect²¹⁶. For instance, following the implementation of the French bonus-malus system that provided a financial incentive to replace old and polluting vehicles with fuel-efficient ones, an increase of the vehicle fleet has been observed, with sales boosted by 13% compared to baseline²¹⁷. While environmental performances of new vehicles improved, the voucher led to an increase of the production of vehicles, a polluting process, and to an increased use frequency and duration of journeys for energy-efficient cars. In the short term, the scheme resulted in a 1.2% increase in CO₂ emissions. In the longer term, estimates on CO₂ emissions evolution were variable, from -0.4% to +13.4%²¹⁸. With the shift of the French bonus/malus scheme in 2019 to target more specifically low-income households and those that depend on their vehicle for their livelihood,

²¹² Interview with stakeholder, April 2021

²¹³ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

²¹⁴ Austrian Institute for Economic Research 2019, Effekte eines ermäßigten Mehrwertsteuersatzes für Reparaturdienstleistungen

²¹⁵ CO2logic 2019, Évaluation de l’impact climatique associé à l’utilisation d’eco-chèques en Belgique

²¹⁶ INSEE 2012, Le bonus/malus écologique : éléments d’évaluation, Stakeholder interview

²¹⁷ Commissariat général au développement durable 2013, Évaluation économique du dispositif d’écopastille sur la période 2008-2012

²¹⁸ INSEE 2012, Le bonus/malus écologique : éléments d’évaluation

the environmental impact was found to be positive, with a reduction in atmospheric pollution and savings of CO₂ emissions (taking into account production and distribution of gas, construction of new vehicles, production of electricity, usage of new vehicles, destruction of old vehicles)²¹⁹. Still, depending on the product, a targeted approach may be necessary to mitigate the rebound effect.

Measure 5a.2 is expected to have positive environmental effects compared to baseline. In the literature, GPP is often identified as a tool that can address environmental problems such as deforestation, greenhouse gas emissions, water use, energy efficiency, waste, etc.²²⁰. It was shown that, for almost ten product groups frequently procured by public institutions in the European Union, the use of GPP produced a reduction of CO₂ emissions. The table below presents the difference between the CO₂ emissions of a core and comprehensive green product compared to a non-green product²²¹. It shows large variability according to the products groups.

Table 49 CO₂ impact of GPP per functional unit (negative numbers imply reductions in CO₂ emissions)

| Product group | unit | core | comprehensive |
|---------------------|------------------------|-------|---------------|
| Cleaning services | m ² cleaned | 0% | -100% |
| Construction | building | -69% | -70% |
| Electricity | kWh | -26% | -100% |
| Catering & food | lunch prepared | 0% | |
| Gardening | m ² garden | -100% | -100% |
| Office IT equipment | computer | -24% | -24% |
| Paper | kg paper | -97% | -89% |
| Textiles | kg textile | -76% | -76% |
| Transport | vehicle | -12% | |

Source: Collection of statistical information on Green Public Procurement in the EU, 2009

In Austria, the city of Vienna set up the ÖkoKauf (EcoBuy) programme in 1998 to procure green products and services, for an amount of about EUR 5 billion annually. It is estimated that the programme reduced CO₂ emissions by about 15,000 to 30,000 tonnes per year^{222 223}.

Furthermore, pre-tender market consultations with market suppliers allowed in GPP within the framework of the EU public procurement directives can enable them to explore circular business models²²⁴, which have a potential to reduce the environmental impact (Option 6).

²¹⁹ French Ministry of Ecological Transition (2021), “Prime à la conversion des véhicules particuliers en 2019: bilan socio-économique”

²²⁰ For instance, European Commission 2017, Public procurement for a circular economy or OECD 2015, Going Green: Best Practices for Sustainable Procurement

²²¹ PwC, Significant and Ecofys 2009, Collection of statistical information on Green Public Procurement in the EU

²²² ConPlusUltra 2014, Green Public Procurement in the City of Vienna Impact Analysis

²²³ OECD 2015, Going Green: Best Practices for Sustainable Procurement

²²⁴ European Commission 2017, Public procurement for a circular economy

6.3.3. Social impacts

Measures 5a.1 and 5a.2 are expected to have positive effects in terms of job creation. Incentives aiming at supporting local companies, such as eco-vouchers, taxation or, to a certain extent, GPP or EPR, support the creation of non-offshorable jobs, whether for the design of more sustainable products or for low-skill work (e.g., distribution channel, waste collection, recycling). For instance, the Belgian eco-vouchers have led to the creation of 1,300 jobs²²⁵. The creation of non-offshorable jobs can give opportunities for low-skilled workers to subsequently improve their skills and develop their career through practical training²²⁶: according to the non-profit network organisation RREUSE, social enterprises active in the circular economy provide “green skills development and lifelong opportunities for vulnerable groups”²²⁷. RREUSE estimated that a social enterprise can create 20 to 140 jobs per 1,000 tonnes, depending on the product that is collected with a view of being re-used (20-25 jobs for textile, 35-70 for multi household products, and 60-140 jobs for electronic and electrical equipment). The Circular Economy Action Plan estimates that the overall job creation linked to the circular economy increased by 5% between 2012 and 2018 in the EU²²⁸.

Measure 5a.1 would contribute to issue guidelines to advice on taxation, that comes under the jurisdiction of MSs. A socio-economic assessment of a global switch of taxes from labour to pollution and resource use to incentivise sustainable production found that this could provide additional employment to 6.6 million people²²⁹ over a five-year period compared to business as usual. In turn, labels can increase the workers and consumers’ safety as they often include requirements regarding chemicals and other hazardous products. In sub-option 5a, the adoption of labels is voluntary, although a catalyser for GPP. To enhance comparability and trust for consumers, it is key to support the readability of reputational incentives²³⁰. As only guidelines are issued, MSs might adopt various schemes, thus affecting information access for consumers.

Furthermore, economic and reputational incentives and GPP aim at influencing consumption habits and can assist consumers in drawing attention towards environmental impacts of products and services.

The introduction of incentives may lead to price increases in the short term, which will raise the question of social fairness and require a case-by-case analysis and possibly the introduction of support measures²³¹. However, in the medium and long terms prices are expected to decrease due to the effect of the incentives and even reach lower values than ‘traditional’ products thanks to economies of scale²³². Therefore, the issue of affordability of more sustainable products should be only temporary.

²²⁵ Roland Berger 2017, « Les avantages du système des éco-chèques par rapport à un montant net équivalent – Analyse d’impact pour les pouvoirs publics »

²²⁶ Cambridge Econometrics, Trinomics, and ICF 2018 for DG ENV, Impacts of circular economy policies on the labour market

²²⁷ RREUSE 2021, Briefing – Job creation in the re-use sector: data insights from social enterprises

²²⁸ European Commission 2020, Circular economy action plan

²²⁹ ACCA 2018, Tax as a force for good - Rebalancing our tax systems to support a global economy fit for the future

²³⁰ Ministère de l’Écologie, du Développement durable et de l’Énergie (2013), Bilan au parlement de l’expérimentation nationale, Affichage environnemental des produits de grande consommation

²³¹ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

²³² Ecorys 2012 for DG ENV, Study on Incentives Driving Improvement of Environmental Performance of Companies

6.4. Sub-option 5b: Linking incentives to performance

6.4.1. Economic impacts

6.4.1.1. Administrative burden

By shifting the linkage of performances for incentive implementation from voluntary to mandatory, measure 5b.1 would incur higher administrative burden for companies (e.g., setting up information collection process, including access to testing facilities and training). Direct economic gains are however expected to exceed spending, as numerous companies have established that qualifying for reputational incentives proves beneficial despite its cost²³³.

Administrative burden for economic operators

As concerns measure 5b.1, it is expected that mandatory requirements would result in an increased number of incentives being introduced to reach the agreed goals. It would thus result in increased administrative burden for companies, as illustrated for 5a.1.

Measure 5b.2 will also generate an administrative burden for companies, for instance to monitor material flows and verify product content. The textile examples show that product content certification costs in terms of secondary raw material decrease according to the number of certified items, and range from EUR 2,232 for a single item to EUR 575 for 50 items (leading to costs between EUR 0.01 and EUR 0.70 per product)²³⁴.

These additional burdens would however be limited, as they would comply to a harmonised bundle of measures across the EU.

Administrative costs for the European Commission

Measure 5b.1 will incur costs as the EC would have to support MSs in introducing incentives based on performance classes. Additional administrative burdens would result from ensuring that they are properly linked to performance classes. These costs may vary from one incentive to another but are expected to remain limited compared to the already existing flow of products and waste statistics reported by the MSs to EUROSTAT.

As for measure 5b.2, the administrative costs for the EC will be linked to drafting the legislative acts and ensuing supporting guidelines and tools for the implementation of eco-modulation in MSs. An additional burden would be linked to monitoring the measure uptake. But costs are expected to remain limited.

By implementing common rules across Europe for sub-option 5b, market fragmentation can be reduced.

Administrative burden for Member States

In addition to sub-option 5a, the administrative burden for MSs depends to the linkages to be established between performance classes and incentives (option 4). Costs will also be incurred to monitor the uptake for the different products groups. Costs are however expected to remain limited in comparison to the current monitoring of product groups and waste statistics.

²³³ DG ENV 2020, Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods

²³⁴ RDC Environnement for ADEME 2020, Définition des critères d'éco-modulation applicables à la filière REP TLC

6.4.1.2. Direct economic impact for businesses

The measures under sub-option 5b are non-discriminatory: all economic operators would be granted the same rights related to the performance classes of their products.

Given the mandatory requirement, measure 5b.1 would enhance the positive economic impacts identified for sub-option 5a, especially the increase of companies' revenues, but would also entail further costs for businesses (e.g., setting up information collection and monitoring processes, including access to testing facilities and training, research and development). The benefits would likely be higher than the costs, considering that companies already comply with higher-than-mandated sustainability standards based on their own cost and benefit consideration²³⁵.

As regards measure 5b.2, the introduction of eco-modulation in EPR schemes is an incentive for companies to introduce more sustainable products in the market and a mean to generate savings in EPR fees that will increase revenues for companies already marketing such sustainable products²³⁶. Such a modulation has a real potential to steer the market: while a new eco-modulation is under discussion, the share of eco-modulated products for the French EPR scheme on textiles has increased, from 0.64% in 2018 to 2.16% in 2019, after the number of eco-modulated items on the market had already doubled between 2017 and 2018²³⁷.

While it can foster the usage of material that is easier to recycle on the market, the introduction of additional eco-modulation in existing or new EPR schemes could however have detrimental effects on companies' production costs, that can only be partially passed on to the customer. For instance, a study showed that the replacement of non-recyclable plastic containers by recyclable plastic or paper would result respectively in a 109% or 34% increase of the producer's EPR contribution due to weight increase²³⁸.

Although it is expected that the cost of secondary raw material will decrease in the medium-term and become competitive and even lower than virgin material, the introduction or increased usage of recycled material in products can incur immediate costs increases. Depending on the location of recycling facilities, the introduction of a criteria to include recycled content could indeed trigger higher raw material prices due to labour cost and sorting automation. In the textile industry, compared to virgin material, it is estimated that the cost of recycled material could be 40% higher if recycled in France but 70% lower if recycled in Bangladesh. In the medium-term, after 2025, the cost of the recycled material in France could decrease thanks to technological developments and be 55% lower than virgin material²³⁹.

As for sub-option 5a, sub-option 5b would result in cost increases to invest in sustainable production, but also cost reductions for producers of sustainable products to which economic incentives are applied. These effects depend on types of economic incentives introduced by MS and on whether an EPR scheme is in place for specific product groups .. Sub-option 5b would however provide opportunities for innovative companies, some of which could be SMEs, albeit

²³⁵ DG ENV 2020, Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods

²³⁶ For instance, for the textile sector in France, the share of products available on the market linked to eco-modulation according to three non-cumulative criteria (eco-design, integration of recycled material from used textiles and shoes, integration of recycled material from by-products) represented 0.64% of the total in 2018, with a doubling in volume from 2017, and increased to 2.16% in 2019. RDC Environnement for ADEME 2020, Définition des critères d'éco-modulation applicables à la filière REP TLC

²³⁷ RDC Environnement for ADEME 2020, Définition des critères d'éco-modulation applicables à la filière REP TLC

²³⁸ E3 Conseil 2021, Quand l'éco-modulation des contributions décourage l'éco-conception, <http://www.e3conseil.com/fr/blog/quand-l-eco-modulation-des-contributions-decourage-l-eco-conception>

²³⁹ RDC Environnement for ADEME 2020, Définition des critères d'éco-modulation applicables à la filière REP TLC

they are generally less innovative than large companies²⁴⁰. Despite that, the implementation of sub-option 5b is expected to have higher impacts on SMEs compared to large companies. SMEs are more reactive to higher administrative burden²⁴¹, and are thus more likely to adapt their production to develop more environment-friendly products. As for sub-option 5a, they are less likely to benefit from economies of scale due to a limited range of products.

From a fiscal point of view, a potential side-effect would be the decrease of revenues for manufacturers. If, once proper incentives for repair are in place (e.g., reduced VAT), new purchases should decline because of the increase in repaired products, the value-added linked to these purchases would be lost²⁴².

6.4.1.3. Indirect economic impact for businesses

Within measure 5b.1, reputational incentives, such as labels and ‘name and shame’ strategies, can further enhance the indirect positive economic effect by improving the information consumers have access to. As a consequence, companies are encouraged to improve their production processes and the working conditions in order to benefit from the reputational incentives and the positive image they convey. This can lead to investment in research and innovation in order to gain a competitive advantage by producing the most sustainable product²⁴³.

Evaluation and management instruments, such as the European Eco-Management and Audit Scheme, have been found to reduce the cost for resource, energy and waste management, and to potentially lead to organisational and process innovations, as the primary goal of the instrument is to improve the performance of companies²⁴⁴. Furthermore, it has been shown that cost savings as a benefit of participating in these schemes can outweigh the associated registration costs, although cost efficiency can be different according to sectors or types of organisations.

The mandatory nature of measure 5b.1 and measure 5b.2, with the use of performance classes, could also potentially harmonise the European market compared to sub-option 5a, that would rely on the voluntary implementation of incentives by MSs. This harmonisation would ensure coherence and alignment with product requirements under the SPI and heighten the impacts of the EPR schemes²⁴⁵.

6.4.1.4. Economic impact for citizens

For citizens, sub-option 5b will likely lead to price increases in the short term, as a pass-through of the costs for companies is expected to occur²⁴⁶. The magnitude of this pass-through depends on many variables and on the specific products. As per the impact on SMEs, this element will be analysed in a specific impact assessment carried out for the target product when SPI measures should be developed. In the medium to longer term, prices of more sustainable alternatives are

²⁴⁰ OECD 2018, Promoting innovation in established SMEs

²⁴¹ Ecorys 2012, Study on Incentives Driving Improvement of Environmental Performance of Companies.

²⁴² Austrian Institute for Economic Research (2019), Effekte eines ermäßigten Mehrwertsteuersatzes für Reparaturdienstleistungen

²⁴³ Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU

²⁴⁴ SWD(2017) 253 final, EMAS and Ecolabel Fitness Check

²⁴⁵ Textile industry companies and business organisation’s input in the stakeholder survey, October 2021

²⁴⁶ RBB Economics (2014), Cost pass-through: theory, measurement, and potential policy implications

expected to decrease due to the effect of the incentives. For certain products groups, prices could even reach lower values than ‘traditional’ products thanks to the economy of scale.

6.4.2. *Environmental impacts*

The implementation of measure 5b.1 will significantly enhance the environmental effects identified for measure 5a.1. Indeed, rather than relying on a voluntary participation, measure 5b.1 will require MSs to introduce incentives to achieve their objectives and will thus result in a faster implementation compared to sub-option 5a. The literature has indeed shown that the environmental performance of businesses improves with mandatory measures, while voluntary ones are “unlikely to bring about significant improvement in environmental outcomes”^{247 248}.

Mandatory reputational incentives are expected to better enable consumers to choose sustainable products, by facilitating the understanding of the information provided. They will assist in diminishing the negative environmental impacts of production and consumption. Indeed, the effectiveness of a voluntary measure depends in large part on the size of the organisation. Large companies are more likely to implement voluntary measures due to higher investment and capital needs, and therefore reputation²⁴⁹. Engagement in voluntary incentives is thus a major limitation to the policy’s effectiveness and take-up.

Measure 5b.2 is also expected to have positive environmental impacts. The literature recognises the effectiveness of EPR schemes to address environmental goals (e.g., reduced waste, increase recycling) but underlines the need for empirical assessments to better understand their effects²⁵⁰. The current implementation of EPR schemes provides limited incentives to modify product design^{251 252} and – considering the example of the widespread EPR scheme on plastic packaging – only few schemes have gone further than basic fee modulation²⁵³. More advanced eco-modulation would, in this case, enhance scheme effectiveness by charging higher fees to producers introducing non-sortable, non-recyclable or difficult-to-recycle packaging (e.g., additives), while rewarding reusable packaging producers. A recent study on the introduction of eco-modulation for the textile EPR scheme in France notes the impossibility to generalise environmental results to the whole sector, due to product variability. It however estimates that the introduction of a criteria on recycled material for a t-shirt (30 or 60%) could lead to a reduction of GHG emissions by 10 to 20% and eutrophication reduction by 20 to 40%²⁵⁴.

6.4.3. *Social impacts*

The implementation of sub-option 5b will significantly enhance the social effects identified for measure 5a.1. Incentives and eco-modulation in EPR schemes will be introduced at a faster pace, thus enhancing the job creation potential on the EU market in related fields, such as recycling or

²⁴⁷ Aragon-Correa J., Marcus A. & Vogel D. 2020, The effects of mandatory and voluntary regulatory pressures on firms’ environmental strategies: a review and recommendations for future research

²⁴⁸ « Nous, marques textiles, demandons à être plus régulées », 7th July 2021, https://www.lemonde.fr/idees/article/2021/07/07/nous-marques-textiles-demandons-a-etre-plus-regulees_6087296_3232.html

²⁴⁹ Ecorys (2012), Study on Incentives Driving Improvement of Environmental Performance of Companies

²⁵⁰ OECD 2015, What have we learned about extended producer responsibility in the past decade? A survey of recent EPR economic literature

²⁵¹ Material Economics 2018, The Circular Economy a Powerful Force for Climate Mitigation

²⁵² OECD 2017, La responsabilité élargie du producteur, mise à jour des lignes directrices pour une gestion efficace des déchets

²⁵³ IEEP 2017, EPR in the EU Plastics Strategy and the Circular Economy: A focus on plastic packaging

²⁵⁴ RDC Environnement for ADEME 2020, Définition des critères d’eco-modulation applicables à la filière REP TLC

eco-design. The sub-option aims at further developing and strengthening the market for sustainable products, while at the same time contributing to bring their costs down, making them affordable and reliable²⁵⁵.

The use of performance classes will reduce market fragmentation, as MSs will use the same basis to inform customers on the environmental performances of products within the scope of SPI; as a consequence, the above benefits are more likely to be experienced across all MSs. The sub-option will also increase the safety of workers and consumers, as labelling often includes requirements regarding chemicals and other hazardous products.

Similarly to option 5a, the introduction of incentives leading to price increases in the short term will have an impact in terms of social fairness and require a case-by-case analysis and possibly the introduction of support measures²⁵⁶. However, in the medium and long terms prices are expected to decrease due to the effect of the incentives and even reach lower values than ‘traditional’ products thanks to economy of scale. Therefore, the issue of affordability of more sustainable products should be only temporary.

6.5. Sub-option 5c: Consumption-oriented incentives

6.5.1. Economic impacts

6.5.1.1. Administrative burden

Administrative burden for economic operators

Similarly to sub-options 5a and 5b, measure 5c.1 would imply an increased burden for companies: they would have to gather and report data to third-party verification bodies to qualify for reputational incentives (labels), and thus economic incentives (GPP, eco-vouchers, differentiated taxation, carbon bonus, etc.) that would be implemented by MSs to reach their circularity targets. Besides, they would have to absorb the cost of the excise duty if they do not comply.

The additional administrative burden required under sub-option 5c might be more difficult to absorb for SMEs, given their quasi-fixed costs nature resulting in a higher share of their revenues and profits being absorbed for such measures.

Administrative costs for the European Commission

For all measure, the European Commission would bear costs for the development of guidelines.

Measure 5c.2 would require additional efforts, as the European Commission is expected to determine a minimum amount of excise duty payable for each product.

Administrative burden for Member States

For all measures MSs are expected to bear most of the administrative burden as they would be in charge of the implementation.

²⁵⁵ OECD (2016) *Creating market incentives for greener products*. OECD Publishing. Paris.

²⁵⁶ European Parliament EPRS 2020, *Comprendre la fiscalité environnementale*

Measure 5c.1 would require “significant changes for stakeholders in levels of activity, behaviour or technology”²⁵⁷, which could imply consequential implementation efforts for MSs. The cost linked with monitoring the carbon bonus could however be limited, as it would represent an additional process within the annual monitoring of tax returns. The compensation of household carbon savings could also represent a financial burden for MSs, although it could be offset with revenues from the excise duty.

Measure 5c.2 would entail costs for MSs due to the implementation, compliance monitoring and penalty processes that would be required. The implementation cost can be kept low if the duty is collected in the same way as other taxes applicable to the product. In Sweden, it was effectively the case: only 0.1% of the total revenues from energy and carbon taxes equated to administrative costs for the tax authority²⁵⁸.

6.5.1.2. Direct economic impact for businesses

The measures under sub-option 5c are expected to have a positive impact on companies supplying sustainable products and services. This effect would be enhanced with the implementation of measure 5c.1, as purchases would be explicitly encouraged because of the consumer bonus. In addition, sustainable companies might benefit from the competitive advantage over those who have to pay higher excise duty due to the low environmental performance of their products²⁵⁹.

Measure 5c.1 would in line with the Polluter Pays Principe internalise externalities and so shift consumption towards more sustainable products. As such, the bonus would be a win-win solution. The manufacturer would have an incentive to place on the market products with lower carbon footprint, as this would lead to higher market uptake from the consumers. The consumers would be incentivised to buy products with lower carbon footprint, as they would receive a direct economic benefit through a tax rebate calculated as difference between the carbon footprint of the average product sold in the market and the carbon footprint of the specific product bought.

Still, companies’ competitiveness could be affected as they would have to evaluate the product performance against the proposed excise duty²⁶⁰, and invest in sustainable production (e.g., by changing manufacturing processes) in order to be exempt of the excise duty and / or to benefit from the consumer bonus^{261 262}. This investment cost might not be fully passed on to the consumer, and thus temporarily reduce profits for parts of the market. These effects could be heightened for SMEs, as their financial situation is more sensitive to revenue and expense variations. However, certain SMEs tend to be more innovative than large companies and could benefit from these opportunities.

Measure 5c.2 has the potential to generate the highest negative impact on companies as the additional tax burden would unlikely be fully passed on consumers²⁶³. The level of pass-through would depend on the consumers’ price sensitivity, or on price regulation for some products²⁶⁴.

²⁵⁷ BIO Intelligence Service, Cambridge Econometrics, LEI and the Institute of Social Ecology for DG ENV 2013, Modelling of Milestones for achieving resource efficiency – Task 1: Turning milestones into quantified objectives

²⁵⁸ UN Committee of Experts on International Cooperation in Tax Matters 2019, Environmental tax issues

²⁵⁹ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

²⁶⁰ Stakeholder consultation, October 2021

²⁶¹ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

²⁶² OECD 2021, Towards a national Strategic Framework for the circular economy in Czech Republic

²⁶³ RBB Economics 2014, Cost pass-through: theory, measurement, and potential policy implications

²⁶⁴ UN Committee of Experts on International Cooperation in Tax Matters 2019, Environmental tax issues

6.5.1.3. Indirect economic impact for businesses

Sub-option 5c is expected to have positive indirect impacts: measure 5c.1 would support the development of product testing, repairing and recycling activities. The reputational incentives that would be implemented by MSs could further enhance the indirect impacts identified for measures 5a.1 and 5b.1, namely the support of GPP, knowledge spill-overs, positive network effects and stronger trust, especially among early adopters of risky innovative products²⁶⁵.

As for PO4, sub-option 5c might lead to changes in demand as consumers would be explicitly encouraged to choose sustainable products with the carbon bonus and the excise duty. This could lead to a lower number of products being manufactured and sold per year, as their replacement rate would fall. This would be especially the case for products for which consumers show a strong willingness to pay for improved reparability and durability.

6.5.1.4. Economic impact for citizens

Measure 5c.1 is expected to have a positive economic impact for citizens, especially the most vulnerable. Better-off consumers would be less incentivised to participate, even though their carbon footprint is the most significant²⁶⁶: it was demonstrated that consumers with high carbon footprints would be less inclined to take carbon-conserving decisions than those with smaller footprints, when provided with a Personal Carbon Allowance (PCA) without any further incentive²⁶⁷. As concerns the poorer brackets, the carbon bonus could represent a financial opportunity. However, depending on the economic operators' costs pass-through to the consumers, the price increase might limit their ability to choose sustainable products and to benefit from the carbon bonus scheme.

The implementation of a carbon bonus would have to be a long-term measure to be fully integrated in consumption habits: in Denmark, free one-month travel cards for public transports were distributed to 500 car drivers. During the experiment, an increase in the use public transport was observed. However, this increase dissipated as soon as the experiment was over²⁶⁸.

Measure 5c.2 can have a counter-productive effect on citizens and lead to economic imbalances²⁶⁹. Instead of turning to more sustainable products, consumers might find other solutions to access less sustainable but cheaper products: a study found that high excise duty rates, such as the ones in Nordic countries on beer, led to an increase of cross-border shopping, which was facilitated with the free movement of goods with or within the European Union²⁷⁰. A similar situation might be observed, although there could be duties applied on products coming from non-EU countries.

6.5.2. *Environmental impacts*

The implementation of sub-option 5c is expected to enhance the environmental impact reduction more than under sub-option 5b, with the implementation of a carbon bonus for citizen and an excise proportional to the life cycle. However, the literature is scarce on the effects of these

²⁶⁵ Sant'Anna School of Advanced Studies and Öko-Institut on behalf of DG ENV 2020, Identification of elements for a future Strategy for the EU Ecolabel

²⁶⁶ UNEP 2020, Emissions Gap Report 2020

²⁶⁷ Capstick S. & Lewis A. n.d., Personal carbon allowances: a pilot simulation and questionnaire

²⁶⁸ Roy, S. & Woerdman, E. 2012, End-user emissions trading: what, why, how and when?

²⁶⁹ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

²⁷⁰ EY & Regioplan 2014, Economic effects on high excise duties on beer

instruments on circularity. Therefore, the potential environmental impacts of the measures specific to sub-option 5c have been determined in comparison with akin instruments, such as carbon offsetting programmes and carbon taxation.

As for Measure 5c.1, voluntary carbon offset programmes are similar to carbon bonuses, as consumers purchase offsets from domestic or international providers to compensate for their emissions. Carbon offsets however present the risk of a rebound effect, as they can alleviate consumers' guilt and encourage them to continue or to even increase their unsustainable practices²⁷¹. Carbon bonuses present a similar risk as wealthier consumers would be less incentivised to participate, even though their carbon footprint is the most significant²⁷².

Carbon bonuses can also be compared to the Personal Carbon Goals that were experimented in Norfolk Island (Australia) in 2011. The local government implemented a 15-month trial, named the Norfolk Island Carbon Health Evaluation (NICHE) Project²⁷³. In total, 27% of all households of the island volunteered to participate and received a unique carbon goal that was 10% below baseline level. They were assigned a carbon card account to use at petrol stations, with a fuel discount, and had an incentive to go under the assigned goal to save money on utility bills and / or fuel for the vehicle. At the end of the experimentation, it was found that carbon emissions fell by 25.1% with the reduction of fuel consumption, and by 12.3% with the reduction of electricity usage. However, petrol / diesel consumption and active mobility (public transport, cycling) did not appear to have changed.

Measure 5c.2 may potentially have a positive environmental impact as, according to the literature, it could "help enable a systemic transition towards the circular economy"²⁷⁴. Replacing labour taxes with taxes on finite resources (or less sustainable products) could indeed promote less resource-intensive and more labour-intensive practices (e.g., remanufacturing)²⁷⁵. The occurrence of such impact, and its magnitude, would depend, however, on each MS, as national governments have competence over labour taxation.

An excise duty proportional to the life cycle environmental performance, encouraging consumers to switch to more sustainable products, can be compared to measure 5b.1. By using performance classes and raising the costs of products difficult to collect and recycle, this measure will assist in shifting consumer demand and promoting more sustainable alternatives. An articulation with EPR schemes needs to be identified.

Similarly, an excise duty encouraging companies to improve their product's environmental performance over its life cycle could also have effects similar to carbon taxation. When comparing MSs that have implemented a carbon tax²⁷⁶ with those that have not²⁷⁷, it has been found that this mechanism has a "positive and significant impact (...) on stimulating the

²⁷¹ a study finds that "a promise to fully offset customers' carbon emissions resulting from electricity usage increases their energy use post-adoption by 1-3%" Cf. Harding M. & Rapson D. 2013, Do Voluntary Carbon Offsets Induce Energy Rebound? A Conservationist's Dilemma

²⁷² UNEP 2020, Emissions Gap Report 2020

²⁷³ Hadley, L. 2020. Removing barriers to environmental action: the impact of personal cap-and-trade systems of individuals' sense of efficacy and personal responsibility for climate change

²⁷⁴ Ellen Macartur Foundation 2015, Towards a circular economy: business rationale for an accelerated transition

²⁷⁵ ACCA 2018, Tax as a force for good - Rebalancing our tax systems to support a global economy fit for the future

²⁷⁶ Finland, Latvia, Denmark, Slovenia, Sweden, Ireland, France and the United Kingdom

²⁷⁷ Belgium, Germany, Malta, Bulgaria, Estonia, Netherlands, Luxembourg, Portugal, Hungary, Romania, Lithuania, Croatia, Slovakia, Italy, Poland, Cyprus, Greece, Spain and Czech

reduction of carbon emissions”²⁷⁸. The study determined that the reduction ranged from 2.61% to 3.04% from 1990 to 2017, which is significant at country-scale.

6.5.3. *Social impacts*

Measure 5c.1 is expected to have a positive social impact as it would encourage a behavioural change leading to the selection of products having greater sustainability. Most of the households (68.1% of those that took part to the NICHE Project) declared that Personal Carbon Trading would be “an acceptable mandatory tool to improve the environment”²⁷⁹. Compared to baseline results, the positive replies increased by 19.2%. This growth was attributed, in part, to the improved awareness and understanding of carbon emissions linked to consumption. Households that did not participate did not change their opinion or behaviours.

A survey that was conducted with a representative sample of the British population and a study that conducted an online simulation found that participants would be more willing to reduce their energy use under a Personal Carbon Trading (PCT) scheme compared to an energy tax system²⁸⁰. Besides, they also indicated that they would be more willing to reduce daily consumption with PCT, a product that was outside the scope of the system that was proposed. In the simulation, participants made more energy-conserving choices as the carbon allowance diminished. However, these results are only hypothetical, and decisions could be different in a real-life situation. This illustrates the potential for behavioural change, which could in turn be beneficial for the environment. A simulation undertaken for personal carbon allowances found comparable results²⁸¹.

Measure 5c.2, if accompanied by a shift of taxation on labour, has the potential to support the uptake of more labour-intensive and less resource-intensive activities, which would trigger job creation. A socio-economic assessment of globally switching taxes from labour to pollution and resource use to incentivise sustainable production found that such a solution could provide employment to 6.6 million people²⁸² over a five-year period compared to business as usual. This condition would depend, however, on each MS, as national governments have jurisdiction over labour taxation. There is however the risk of job being lost in companies that produce the less sustainable products, as their turnover would decrease.

The excise duty is also at risk of creating social unrest across Europe, as taxation has a differentiated effect on different categories of consumers, due for instance to the availability and cost of alternatives or household incomes²⁸³. Such an instrument could lead to social events, as the Gilets Jaunes (Yellow Vest) movement has shown in France after October 2018. This campaign started after the French government announced an increase of the internal consumption tax on energy products that would in turn increase the price of car fuel prices. Although the environmental benefit of such increase was widely accepted by the participants of the movement, it was perceived that the economic inequality would deepen between urban territories with good

²⁷⁸ Ghazouani, A., Xia W., Ben Jebli M. & Shahzad U. 2020, Exploring the role of carbon taxation policies on CO2 emissions: contextual evidence from tax implementation and non-implementation European countries

²⁷⁹ Hadley, L. 2020. Removing barriers to environmental action: the impact of personal cap-and-trade systems of individuals' sense of efficacy and personal responsibility for climate change

²⁸⁰ Hadley, L. 2020. Removing barriers to environmental action: the impact of personal cap-and-trade systems of individuals' sense of efficacy and personal responsibility for climate change

²⁸¹ Capstick S. & Lewis A. n.d., Personal carbon allowances: a pilot simulation and questionnaire

²⁸² ACCA 2018, Tax as a force for good - Rebalancing our tax systems to support a global economy fit for the future

²⁸³ European Parliament EPRS 2020, Comprendre la fiscalité environnementale

public transport links, and rural ones with inadequate or inexistent public transport, where car travel is inevitable. Furthermore, the revenues would have fed the State general budget, rather than improving environmental performances. This event underlined the need to identify the use of the revenue generated by the tax to enhance social acceptability: for instance, redistributing the proceeds of the tax to households, using them to support investment and innovation in environmental performance, or reducing social security contributions in order to promote employment²⁸⁴.

6.6. Impacts on third countries

It is a known fact that a transition towards a circular economy will have implications at a global scale and will result in the evolution of primary and secondary resources flows²⁸⁵, as shown with the recent bans on waste imports for recycling in several Asian countries. There is limited literature available on the interlinkages between international trade and circular economy²⁸⁶, and current EU trade agreements barely mention circular economy. Using macro-economic modelling (E3ME model), a recent study on the impact of a circular economy transition in Africa has estimated negligible trade effects derived from the European transition to circularity²⁸⁷.

While the encouragement to develop and market more sustainable options can lead to recyclable waste flows towards countries with less stringent regulations (e.g., developing countries), the literature also recognises the role of the EU in setting the course and fostering the adoption of similar standards in third-countries to access the EU market²⁸⁸.

The introduction of reputational and price incentives and GPP requirements in measures 5a.1, 5a.2 and 5b.1 is done in a non-discriminatory way. Efforts will be made to mitigate possible adverse effects to developing countries in the context of the EU development cooperation programs (*via* technology transfer and capacity building).

While both measures will generate the benefit of improving standard-setting in third countries to address local environmental and social impacts, the development of incentives such as EPR and its eco-modulation could negatively impact the competitiveness of EU firms in world markets but also the environment with greater affordability for less circular products²⁸⁹.

There is sound evidence that stricter environmental regulations in the EU have had a positive impact on eco-innovation (and circularity) in developing countries, particularly for export-oriented companies with presence in the European market²⁹⁰. For instance, the excise duty would

²⁸⁴ Commissariat général au développement durable 2017, La fiscalité matière – une opportunité pour une économie circulaire

²⁸⁵ Kettunen, M., Gionfra, S. and Monteville, M. (2019) EU circular economy and trade: Improving policy coherence for sustainable development, IEEP Brussels / London

²⁸⁶ OECD 2018, International Trade and the Transition to a Circular Economy

²⁸⁷ Rademaekers, K.; Smit, T.A.B; Artola, I.; Koehler, J.; Hemkhaus, M.; Ahlers, J.; Van Hummelen, S.; Chewpreecha, U.; Smith, A. & McGovern, M. (2020) Circular economy in the Africa-EU cooperation – Continental report. Continental report under EC Contract ENV.F.2./ETU/2018/004 Project: “Circular Economy in Africa-Eu cooperation”, Trinomics B.V., Tomorrow Matters Now Ltd., adelphi Consult GmbH and Cambridge Econometrics Ltd.

²⁸⁸ Kettunen, M., Gionfra, S. and Monteville, M. (2019) EU circular economy and trade: Improving policy coherence for sustainable development, IEEP Brussels / London

²⁸⁹ Kettunen, M., Gionfra, S. and Monteville, M. (2019) EU circular economy and trade: Improving policy coherence for sustainable development, IEEP Brussels / London

²⁹⁰ For example, in: Lustosa, M. (2001). Innovation and Environment under an Evolutionary Perspective: Evidence from Brazilian Firms. Nelson and Winter Conference. Aalborg, Danish Research Unit for Industrial Dynamics (DRUID). 140: 18; DIAZ LOPEZ, F.J (2009) Environment, technological change and innovation. The case of the Mexican chemical industry. Faculty of Social Sciences. School of Development Studies. Norwich, University of East Anglia. Unpublished PhD thesis. 302 p.;

be levied on the products placed on the EU market, irrespective of where they are produced. Therefore, it will be a non-discriminatory measure. An on-going study of UN environment has assessed the degree of progress in the implementation of product policies across all world regions. Preliminary findings suggest that most attention is given to end-of-life aspects of products, with waste management and recycling having top priority in developing countries. In contrast, very few policies focus on key aspects of SPI linked to product eco-design, circular business models and consumption patterns. The same study highlights an important barrier for sustainable products due to higher prices and reduced markets. Technical cooperation, access to business support networks, and knowledge exchange on sustainable products and eco-design are considered key elements needed for bridging the gap in global product policy frameworks²⁹¹. Therefore, it is possible to assume a potential positive, cooperation-based and non-discriminatory impact in global value chains due to the implementation in the EU of the measures envisaged in sub-option 5c and the consolidation of an internal market for sustainable products.

Fernández, S., Torrecillas, C., & Labra, R. E. (2021). Drivers of eco-innovation in developing countries: the case of Chilean firms. *Technological Forecasting and Social Change*, 170, 120902.

²⁹¹ UN Environment (2021) Mainstreaming sustainable consumption and production policies and circular economy models: best practices and recommendations. <https://www.oneplanetnetwork.org/Mainstreaming-SCP-policies-best-practices-recommendations>

6.7. Summary of impacts

Table 50 Administrative burden of PO5

| <i>Administrative burden Option 5</i> | | | | | |
|---------------------------------------|--------------|---|---|---|---|
| | | Businesses | | Administrations | |
| | | One-off | Recurrent | One-off | Recurrent |
| Sub-option 5a | | - | - | - | - |
| | Direct costs | <p>Costs associated to certification and verification (product performance)</p> | <p>Reporting on products sustainability performance</p> <p>Costs associated to fulfilling additional performance-requirements in GPP / public tendering</p> <p>Costs associated to fulfilling EMAS, ETV, etc. requirements</p> <p>Differentiated taxation of sustainable alternatives</p> | <p>Implementation cost (for the “Level” reporting tool assessing and reporting on the sustainability performance of buildings) in terms of time to get used to the new reporting instrument</p> | <p>Implementation costs of incentive schemes (for example: 0.1€ per 1€ funded with the eco-voucher scheme)</p> <p>Costs linked to the set-up, monitoring and reporting on reputational and economic incentives</p> <p>Assessment and verification procedure for performance-based eligibility criteria in public procurement</p> <p>Cost of verifying compliance with the performance class set up in a given incentive (e.g., EU Ecolabel, ETV, etc.)</p> <p>Training, tools and skills development (e.g., inventories for sustainability criteria of additional product groups) linked to the purchase of more sustainable products</p> |

| | | | | | |
|----------------------|----------------|---|--|---|--|
| | | | | | Training of new/current staff, development of guides, exchange of best practices |
| | Indirect costs | n.a. | - Loss of reputation and market access for low-sustainability products due to MS purchasing more sustainable products and the introduction of incentive | n.a. | - Potential fiscal losses (e.g., reduced VAT) |
| Sub-option 5b | Direct costs | -- Costs associated to certification and verification (product performance) Costs of removal of environmentally harmful subsidies (legally binding) | - Reporting on products sustainability performance Operation and maintenance of additional EPOs (for new EPR systems in place at national level) | -- Implementation cost Costs derived from the process with stakeholders to establish new EPR schemes (e.g., for consultations, studies, etc.) | -- Implementation costs of incentive schemes (for example: 0.1€ per 1€ funded with the eco-voucher scheme) Costs linked to the set-up, monitoring and reporting on reputational and economic incentives Assessment and verification procedure of the performance-based eligibility criteria in public procurement Cost of verifying compliance with the performance class set up in a given incentive (e.g., EU Ecolabel, ETV, etc.) |

| | | | | | |
|----------------------|----------------|--|---|---|--|
| | | | | | <p>Training, tools and skills development (e.g., inventories for sustainability criteria of additional product groups) linked to the purchase of more sustainable products</p> <p>Training of new/current staff, development of guides, exchanges of best practices</p> <p>Enforcement costs for legally binding targets</p> |
| | Indirect costs | n.a. | -- Loss of reputation and market access for low-sustainability products | n.a. | - Potential fiscal losses (e.g., reduced VAT) |
| Sub-option 5c | Direct costs | -- Costs associated to certification and verification (product performance) | -- Reporting on products sustainability performance EU-level excise proportional to the environmental performance of products | --- Costs associated incurred with the transposition to set up the environmental excise Set up and implementation of a (pilot) carbon bonus incentive for EU citizens at MS-level | --- Costs associated to monitoring and vigilance of different categories of environmental excise. Costs of monitoring the implementation of a (pilot) carbon bonus incentive for EU citizens at MS-level Training of new/current staff, development of guides, exchanges of best practices |

| | | | | | |
|--|----------------|------|---|------|------|
| | Indirect costs | n.a. | <p>---</p> <p>Carbon footprint score incentives (penalises low-sustainability products)</p> <p>Revenue loss from higher taxes on products using virgin materials and unsuitable products for circular economy</p> | n.a. | n.a. |
|--|----------------|------|---|------|------|

Table 51 Economic impacts of PO5

| <i>Economic impacts</i> | | | | |
|---|---------------------------|------------------|------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 5a</i> | <i>Option 5b</i> | <i>Option 5c</i> | |
| <i>Direct impacts</i> | | | | |
| Increased revenues for sustainable products and services providers | + | ++ | +++ | <p>The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions.</p> <p>Product manufacturers will be impacted.</p> |
| Profits | - | -- | -- | <p>Depending on the pass-through level of additional costs (e.g., investment in design and manufacturing processes, taxes, third party verification), all actors in the product value chain will be impacted.</p> <p>For sustainable products and services providers, there is a potential to increase sales and associated profits.</p> |
| Increased activity related to the design of products and production processes | + | ++ | ++ | <p>The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions.</p> <p>Product manufacturers and service providers for support activities will be impacted.</p> |
| Changes in purchasing aptitudes of public authorities and savings | ++ | +++ | +++ | <p>The mandatory green product procurement under measure 5a.2 will result in financial and environmental savings.</p> <p>Public authorities will be impacted.</p> |

| | | | | |
|---|---|----|-----|--|
| Increased product testing, repairing or recycling activities and growth in the repair services sector | + | ++ | ++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions, but also the uptake of circular business models. All actors in the product value chain will be impacted. |
| Greater affordability of sustainable products in the medium term | + | ++ | ++ | Citizens and products users will be impacted. |
| Competitive advantage for companies providing sustainable products and services | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Manufacturers and retailers will be impacted. |
| <i>Indirect impacts</i> | | | | |
| Less products sold on the EU market | - | -- | -- | The introduction of performance criteria should lead to a decrease in the number of products being bought. Evidence however shows a potential for rebound effects. All actors in the product value chain will be impacted. |
| Decreasing activity for companies producing single-use, low-cost products | - | -- | -- | There is a progressing ruling-out of less sustainable products. Product manufacturers will be impacted. |
| Decreasing activity for the mining and quarrying sector | - | -- | -- | Raw material producers will be impacted. |
| Development of circular business models | + | + | + | The increased level of stringency for the different sub-options supports the uptake of circular business models. All actors in the product value chain will be impacted. |

| | | | | |
|---|------|------|-----|---|
| Competitive advantage through operational performance improvement and better reputation | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Manufacturers and retailers will be impacted. |
| Potential fiscal revenue | n.a. | n.a. | + | Sub-option 5c introduces the excise duty. |
| Reduced market fragmentation | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. |
| Improvement of the level playing field between companies in Europe | + | ++ | ++ | Sub-option 5b introduces performance classes. |

Table 52 Environmental impacts of PO5

| <i>Environmental impacts</i> | | | | |
|---|---------------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 5a</i> | <i>Option 5b</i> | <i>Option 5c</i> | |
| <i>Direct impacts</i> | | | | |
| Reduction of waste | + | ++ | ++ | Measures are expected to incentivize the production and consumption of more durable and repairable products, which extends product lifetime before being discarded. |
| More secondary materials are available and used in production | + | ++ | ++ | |
| Buyers choose more durable, reliable, and repairable products | + | ++ | +++ | The measures are cumulative with an increasing level of stringency for the different sub-options, leading to an increased number of incentives being introduced. Citizens and product users will be impacted. |

| | | | | |
|--|---|-----|-----|---|
| Less sustainable options are driven out of the market | + | ++ | +++ | There is an increased level of stringency for the different sub-options, leading to an increased number of incentives being introduced. All actors in the product value chain will be impacted. |
| Indirect impacts | | | | |
| Indirect environmental impacts associated with the production of new products decrease as demand decreases | + | +++ | ++ | The introduction of performance criteria should lead to a decrease in the number of products being bought. Evidence however shows a potential for rebound effects. All actors in the product value chain will be impacted. |
| Decreasing environmental impact of material extraction | + | ++ | ++ | Raw material producers will be impacted. |

Table 53 Social impacts of PO5

| Social impacts | | | | |
|--|---------------------------|------------------|------------------|---|
| Description | Amount/qualitative | | | Comments |
| | Option 5a | Option 5b | Option 5c | |
| Direct impacts | | | | |
| Better access to information for consumers | n.a. | ++ | ++ | From sub-option 5b, incentives are linked to performances classes. Citizens and products users will be impacted. |
| Increased incentive to improve the safety of workers and consumers | + | ++ | ++ | Reputational incentives have a potential to improve safety. Workers, citizens and products users will be impacted. |

| | | | | |
|---|------|------|-----|--|
| Job creation | + | ++ | ++ | There is an increased level of stringency for the different sub-options. Incentives have the potential to create jobs in various sectors, including design and recycling. Measure 5b.2 introduces eco-modulation for the EPR scheme. Labour in specific sectors will be impacted. |
| Vulnerable consumers face higher upfront cost of products | - | -- | --- | There is usually a premium on more sustainable products, although the amount of pass-through from producer to consumer is highly variable. Citizens and products users will be impacted. |
| Increased efficiency of Market Surveillance and customs authorities | + | ++ | ++ | Product manufacturers, service providers for support activities, and public authorities will be impacted. |
| <i>Indirect impacts</i> | | | | |
| Friction on the labour market as some sectors see increasing demand, while others decline | - | -- | -- | Labour in specific sectors will be impacted, which would further impact families. These impacts could also occur in third countries. |
| Social unrest | n.a. | n.a. | -- | Measure 5c.2 will introduce an excise duty. Recent events showed that particular care need to be put in the design of such measures. All actors in the product value chain will be impacted. |
| Companies invest in training and reskilling activities to address new demand | + | ++ | ++ | Product manufacturers will be impacted. |
| Skills development in relation to product life cycle analysis | + | ++ | +++ | Public authorities and citizens will be impacted. |

7. OPTION 6: MEASURES FOR CIRCULAR ECONOMY AND VALUE RETENTION

7.1. Overview

Overview of Policy Option 6

Sub-option 6a: Promotion of value retention and value maximisation

- Measure 6a.1. – Providing guidelines on supporting circular business models.
- Measure 6a.2. – EU-wide hub supporting the uptake of circular business models.

Sub-option 6b: Enhanced value retention

This option includes all measures included in option 6a plus the following:

- Measure 6b.1. – Introducing a transparency obligation and a ban on the destruction of unsold consumer products via SPI acts

7.1.1. *Assumptions used in the analysis*

- A circular business model is “a business model in which the conceptual logic for value creation is based on utilising the economic value retained in products after use in the production of a new offering”. As such, all circular business models are part of a sub-set of sustainable business models, generally resulting in positive environmental, economic and social impacts.
- Circular business models also generate unintended negative impacts and rebound effects (i.e., consumers tend to buy more goods / services than under traditional models because of higher perceived sustainability, or product life extension can be equally implemented to products of lesser environmental performance, resulting in increased net emissions). However, such negative effects are not considered to be so significant to offset the positive impacts obtained from the implementation of a particular business model.
- The impacts generated by sustainable business models result from a combination of policy factors as well as market decisions made by private operators and consumers. However, the assessment of environmental impacts using the Exiobase model cannot quantify the relative impact of a specific policy measure (i.e., the attribution measure). Instead, it is assumed that any improvement potential exists because of the influence of policy support of the sub-options in this study.
- In assessing environmental impacts of all policy sub-options using the Exiobase model, a 5% environmental improvement potential has been assumed for those product groups and circular business models within the scope of SPI where no improvement factor has been identified in the literature.

7.1.2. *What problem and specific objectives does this option address*

Policy option 6 is intended to primarily address sub-problem 1 (Product design does not sufficiently consider environmental impacts over the life cycle, including circularity aspects) by contributing – together with option 5 – to achieving specific objective 3 (Incentivise more sustainable products and business models to improve value retention). It also supports specific objective 1 (Improve product sustainability) by addressing the market failure ‘Markets for

circular business models not fully developed'. This policy option also relates to a number of drivers arising from market, regulatory, and behavioural failures. Such drivers are related to insufficiently developed markets for circular business models and the behavioural failure associated to the persistence of linear production and consumption patterns as the most critical default option.

Stakeholders' views on PO6

There is overall support for all four business models proposed, receiving similar scores. More than half of respondents found that business models based on reverse logistics (60%), product-service systems (54%) and collaborative and sharing economy (50%) would be effective or very effective in encouraging more sustainable production and consumption (getting the score at least 4 out of 5). This number is slightly lower (46%) for on-demand production. Support for any proposed business models was lower from business associations and company organisations (ranging from only 32% for the business model based on collaborative and sharing economy to 47% for the business model based on reverse logistics). A clear regulatory framework to support circular business models, profitability, and insufficient consumer awareness and responsiveness were considered as the main barriers to successful deployment of more circular business models in the EU (receiving scores at least 4 out of 5 by more than 50% of respondents). However, profitability, and insufficient consumer awareness and responsiveness were not seen as barriers by NGOs and environmental organisations (less than a third of respondents gave score at least 4 out of 5). Interestingly, as many as 47% of the respondents indicated that they either do not know or have no opinion on the extent to which the fact that 'banks and investors are often unwilling to provide the credit and funding necessary to initially establish these business models' constitutes a barrier'.

From the industry point of view, the most preferred measures enabling all four business models related to GPP and the decrease of administrative burden for new circular business models. Increase of collaboration amongst the circular business community was also supported for all business models except for the "producer-service systems" business model. For EU citizens and non-business stakeholders, the most preferred measures enabling the "product-service system", "collaborative and sharing economy" and "reverse logistics" business models related to GPP, and obligations to producers for take-back and repair/maintenance. With regards to the "on-demand production" business model there was also a support to develop tools to measure the benefits and financial viability of Circular Business Models, and guidelines on the various EU funding instruments and support mechanisms. Across all stakeholder groups, improving access to finance for the production and consumption of sustainable products, better use of standardisation and mandatory GPP were considered as most important incentives for circularity (receiving scores at least 4 out of 5 from more than 70% respondents). Voluntary schemes such as the Ecolabel were the least supported measure. Other incentives were suggested by the open answers, such as a tax on virgin / fossil materials or a tax on environmental impact.

Evidence from the SME survey suggests that it is necessary to provide technical support and resources for the transition to a more sustainable production and consumption system. An EU wide platform for information and cooperation could be

helpful to bring together different stakeholders and act as a key transition lever²⁹². This supports sub-option 6a with the development of guidelines for circular business models and an EU-wide hub for circular businesses.

It was highlighted that the European Commission should play more of a supportive than regulatory role for circular business models. There should be a promotion of producer ownership models with policy mixes of regulation and tax schemes, as they encourage sustainable products. It was also said that there should be safeguards that this model favours durable goods, which when broken or damaged, are eventually repaired. Additionally, the collaboration between suppliers, manufacturers and researchers should be promoted to stimulate circular solutions. The EC should fund research on consumer acceptance of new business models, their benefits and challenges, as the sustainable option should be more attractive and efficient for the consumer. There should also be minimum recycled content requirements. A logic of hierarchy should be applied to circular initiatives. Additionally, collection schemes should be improved to avoid reparable products being recycled.

SMEs also emphasised the importance of supporting democratic business models, such as worker cooperatives. It was noted that the democratization of businesses, by allowing workers to have a voice and vote in company boards or creating worker-owned cooperatives, can steer companies to more sustainable and equitable business conducts. Co-creation models where different actors in the value chain work together to design sustainable products were also mentioned.

An emphasis was also placed on empowering consumers to participate in do-it-yourself repair resources and providing them with the needed resources to do so, for example, open-source patents. Furthermore, building communities (e.g., digital) where consumers can be empowered to fix or re-purpose their products was mentioned several times.

The category of products for which most respondents considered that a potential ban on the destruction of unsold consumer products should not apply were those that pose a health or safety risk (460 respondents accounting for 92% of respondents). This view was shared across all groups of stakeholders. It was followed by the goods not complying with relevant legislation (54% of respondents) and counterfeit products (44% of respondents).

The introduction of a ban on destruction of unsold goods was also discussed with the SMEs as part of the survey. Stakeholders were asked to decide which circular business models would be most effective to decrease the amount of unsold goods in the EU. The majority of respondents thought that fostering reconditioning and remanufacturing schemes would be an effective measure to decrease the amount of unsold goods in the EU. In contrast, fostering a producer 'duty of care' received only about one-third of the number of responses of the most voted measure. 19% of respondents thought that 'boosting more sustainable business models such as on-demand production' would be a good way to decrease the amount of unsold goods. 16% of stakeholders thought that 'selling damaged products at a discounted price' should be an additional measure taken to decrease the amount of unsold durable

²⁹² IA SME Survey (2021)

products. ‘Fostering donation schemes’ and ‘Fostering greater transparency by producers regarding their product return rates and unsold goods policies’ received 14% of votes. According to SMEs participating in the OPC, products which pose a health or safety risk should be excluded from any introduced ban.

Moreover, to avoid the destruction of goods, stakeholders argued that there should be mandatory multi-criteria and labelling of products on resource efficiency. There should be repair requirements, including requiring producers/importers to allow repairs of their products to be done by independent repairers and guaranteeing supply of spare parts at a reasonable price for +10 years. There should also be mandatory minimum requirements on durability, reparability and recyclability of certain product categories (such as electronics/ICT equipment). Repair information should be readily available for customers online, with non-destructive disassembly required.

According to stakeholders’ statements in the workshop dedicated to the MS experts, the idea of additional EU-level guidance for MS on how to foster circular business models was deemed useful, as was the establishment of an information service on the subject. In general, there was support for the suggestion of an EU-wide prohibition on the destruction of unsold goods, but one participant underlined that this should be accompanied by the collection of more data on this issue at the European level.

7.2. Baseline for PO6

The baseline scenario for this policy option will assess the current state of play regarding business models for value retention and the relevant policy support measures, while looking into their further evolution in case of a ‘no SPI’ scenario.

Circular Business Models have experienced rapid growth in recent years, largely in response to the emergence of new technologies and supportive consumer preferences. While several Circular Business Models involve large firms, entrepreneurship emerges as a key driver of circular business models. Their environmental benefits are largely sector-specific but are expected to be significant. Overall, the market penetration of new circular business models remains limited, and there remains considerable potential for the scale up of models in many sectors²⁹³. Based on the registry of Eutopia Green database²⁹⁴, in the EU there are close to 2,500 companies implementing Circular Business Models. In general, the vast majority of Circular Business Models in the sample correspond to sustainable business models (SBM) based on upgrading / recycling, product-service-systems (PSS), collaborative and sharing economy and reverse logistic.

²⁹³ Support to new and existing circular business models - Task 5 report of this Impact assessment

²⁹⁴ The Eutopia Green database is a brand-new AI-powered platform to access information about over 11,000 European organizations developing sustainable and climate-friendly innovations. The platform includes information such as sector, technology, climate impact, SDGs, financials, development stage, date of establishment, number of employees, and more. Eutopia collects data from public online sources as well as from its strategic partners and the green start-up community. See: <https://www.eutopiagreen.com>

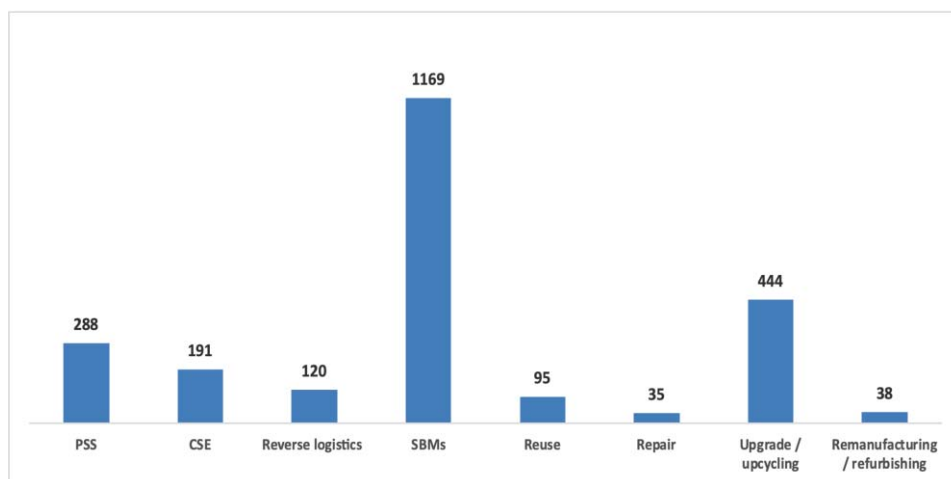


Figure 3 Distribution of Circular Business Models patterns in a sample of 2,380 European companies in the study

The sectoral distribution of the Circular Business Models sample across the target sectors and value chains of the Circular Economy Action plan is portrayed in the figure above. The energy sector reports having the largest amount of Circular Business Models, followed by construction material and works, and means of transport (with an aggregated value of 66% of the total). Plastics, textiles, other sectors (e.g., services) and electronics and ICT report an additional 21% of companies in the sample.

As most new types of Circular Business Models have emerged in recent years, measuring the effect of policy on developing business models is still relatively limited. PSS encompass a wide variety of possible business models and have so far attracted little policy attention, except for measures related more broadly to the servitisation of companies. In the case of collaborative economy, policy interventions have so far tried to keep a careful balance in the promotion of sustainable and social collaborative models, while regulating larger capitalist digital businesses restructuring established markets and creating new ones. At the European Union level, there is a lack of specific policies focusing on supporting servicising solutions. Policy interventions at local/municipal level are more effective in targeting and stimulating the implementation of PSS solutions. Traditional policy instruments targeting product environmental performances (e.g., ecolabelling) have not been sufficient to support PSS innovation.

In the context of circular economy, circular business models based on value retention (via maintenance, repairing, re-furbishing, re-manufacturing, component harvesting, upgrading and reverse logistics), value maximisation (via products-as-a-service, collaborative consumption), and recycling and upcycling are of especial interest. Support for such models requires incentives and further development of markets for circular business models (see Markets for Circular Business Models are not fully developed).

In a 'no SPI' scenario, EU policy support will be limited to traditional innovation funding and financing instruments. The **EU funding landscape** for the coming years has several instruments aiming to promote innovation, entrepreneurship, research, development, and market penetration in the area of the circular economy, sustainable products, circular and sustainable business models, and improving relevant capacities and frameworks. The EU's next research and innovation programme *Horizon Europe* will help to speed up the transformation to a circular economy and deliver on the EU's new circular economy action plan. In addition to supporting

large-scale systemic solutions and regional demonstration projects (such as the circular cities and regions initiative) Horizon Europe will focus on important material streams and sectors highlighted in the Circular Economy action plan, including plastics, construction, electronics, and textiles.²⁹⁵ 40% of the EUR 95.5 billion Horizon Europe budget for 2021-2021 will be devoted to green and digital transition, and sustainable recovery from the pandemic and resilience. Sustainable and circular innovations and business models, sustainable product consumption and production, as well as policy innovations will get support under this programme. Furthermore, financial support for circular innovation will be available in *the InvestEU*²⁹⁶, *European Structural and Investment Funds*²⁹⁷ and *the Recovery and Resilience Facility*²⁹⁸. *The circular bioeconomy investment fund (ECBF)*²⁹⁹ and green finance instruments of the *European Investment Bank (EIB)* will help in de-risking investment into market applications. The ECBF is the first venture fund exclusively focused on bioeconomy and circular bioeconomy in Europe. Its target is EUR 250 million, to which the EIB has committed EUR 100 million. Furthermore, the EIB also has its own range of financing products to support circular economy that amounted close to EUR 2.5 billion over 2015-2019³⁰⁰. Between 2015 and 2019, the EIB financed circular economy investments in a large number of projects in many sectors, as outlined in the following table.

Table 54 The EIB's circular economy approved operations, 2015-2019

| Sector | Lending (€ millions) | Share |
|----------------------------|----------------------|-------------|
| Industry and services | 747 | 30% |
| Waste management | 594 | 24% |
| Agriculture and bioeconomy | 438 | 18% |
| Water management | 426 | 17% |
| Mobility | 95 | 4% |
| Urban development | 80 | 3% |
| Energy | 71 | 3% |
| Total | 2,452 | 100% |

Today the EIB allocates 25% of its financing to climate and other sustainability-oriented investment projects. In the coming years, the EIB will continue focusing on circular economy and its intentions were proven by introducing a financing and advisory package to facilitate projects in circular businesses (see box below). By committing to an official target for 2025, the EIB will increase up to 50% its investment in climate action and environmental sustainability projects. The Climate Bank Roadmap details the EIB's role in supporting the European Green Deal through a wide spectrum of financial products and advisory services³⁰¹.

²⁹⁵ https://ec.europa.eu/info/research-and-innovation/research-area/environment/circular-economy/circular-economy-strategy_en

²⁹⁶ One third of the 1.8 trillion-euro investments from the NextGenerationEU Recovery Plan, and the EU's seven-year budget will finance the European Green Deal.

²⁹⁷ https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/european-structural-and-investment-funds_en. The ESIF mainly focus on 5 areas: research and innovation; digital technologies; supporting the low-carbon economy; sustainable management of natural resources; small businesses;

²⁹⁸ https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en

²⁹⁹ <https://www.ecbf.vc/>

³⁰⁰ <https://www.eib.org/>

³⁰¹ [European Investment Bank Group Sustainability Report 2020 \(eib.org\)](https://www.eib.org/)

Box 1: The EIB's circular economy financing and advisory

In combination with direct financing programmes, the EIB has developed a Circular Economy Guide supporting the circular transition to promote a common understanding of the circular economy concept, its different business models and related challenges and opportunities among the EIB's financial and project partners (reuse, repair, refurbish, re-purpose and remanufacture). With this approach, the EIB raises awareness about and promotes circular business models among its business clients and stakeholders; facilitates and harmonises due diligence and reporting on circular economy projects by the EIB's financial and project partners. The EIB has developed specific guidelines on project eligibility and screening in a wide number of sub-options or categories of circular business models. Besides providing operational guidelines, the EIB also offers other services aimed at informing and raising awareness, providing advisory services for project development, etc.³⁰² The criteria for project eligibility includes a categorisation system along the three dimensions of circular economy (circular design and production, use, value recovery and support), guiding and removing bias in decision making investment projects in specific type of circular business models. This is an example of how a guideline could be used for guiding other financial programmes and schemes Europe-wide and at the MS-level, both for public and private financial institutions³⁰³.

To understand the possible impact of future funding programmes one can look at the lessons from previous EU programmes. An evaluation of the Horizon 2020 programme based on macroeconomic models estimates a significant socio-economic impact from the programme (over EUR 400 billion gained by 2030). However, it was found that commercialisation was still a challenge, that is, only 25% of H2020 project coordinators considered that they would achieve the target full commercialisation three years after the start of the project.³⁰⁴ Private investment in projects were expected to lead to a leverage factor of 2 in one third of H2020 projects. Another 29 % also indicated that there had been no external investment in their innovation and did not expect any in the future. One can envisage similar impacts and challenges linked to the new funding programmes. At the same time, the increased focus on circular and sustainable finance instruments by the EIB could offer a complementary approach and promote the commercialisation of new ideas, including the ones that focus on value retention.

Another policy development that is considered in this baseline scenario is related to the **national initiatives on the ban of destructions of unsold products**. Limited data is available on the number of unsold products being destroyed in the EU and possible trends without EU-action. Ökopol roughly estimated that between 10% and 20% of returned clothing and between 4% and 10% of returned electronics are destroyed with an increasing trend due to growth in e-commerce³⁰⁵, but this is a very rough estimate based on a small dataset related to the German market. At the EU level there is no instrument to address the destruction of unsold products or to increase transparency by economic operators regarding the fate of unsold goods. However, selected MS have been launching some initiatives. The French “law against waste and for a Circular Economy” includes a provision that producers, importers and distributors of new non-food products intended for sale are required to reuse in particular by donating or recycling their unsold products. It is estimated that the introduction of the ban before the end of 2021 could

³⁰² https://circulareconomy.europa.eu/platform/sites/default/files/categorisation_system_for_the_ce.pdf

³⁰³ https://www.eib.org/attachments/thematic/circular_economy_guide_en.pdf

³⁰⁴ EC 2017, Interim evaluation of Horizon 2020, https://ec.europa.eu/info/publications/interim-evaluation-horizon-2020-book_en

³⁰⁵ Policy Brief on Prohibiting the Destruction of Unsold Goods Prepared by Ökopol for the EEB

annually avoid the e.g. destruction of 10,000-20,000 tonnes of new textile products, EUR 180 million worth of hygiene and beauty products in France.³⁰⁶ The Spanish preliminary draft law on contaminated soil and waste includes a ban on the destruction of unsold surpluses of non-perishable products such as textiles, toys and electrical devices, unless another regulation requires their destruction³⁰⁷. The German the Recycling Management Act introduces a general ‘duty of care’ to ensure, when distributing products, also in connection with their return, that their fitness for use is maintained and that they do not become waste. More specific ordinances will follow determining the functioning of the duty of care for specific products. The German act also includes the possibility to introduce a transparency obligation requiring manufacturer to clearly document how unsold products are handled³⁰⁸. The Spanish preliminary draft law on contaminated soil and waste includes a ban on the destruction of unsold surpluses of non-perishable products such as textiles, toys and electrical devices, unless another regulation requires their destruction³⁰⁹. Considering that the public pressure to support bans on destruction of unsold products is growing along with the sharpening political discussion, one can expect that new national initiatives will be introduced in the coming years. This can potentially cause fragmentation of the internal market in the absence of uniform measure restricting the destruction of unsold products at the EU-level. .

7.2.1. Assumptions used in the analysis

- It is assumed that all circular business models are part of a sub-set of sustainable business models, generally resulting in positive environmental, economic and social impacts.
- Circular business models also generate unintended negative impacts and rebound effect (i.e., consumers tend to buy more goods / services than under traditional models because of their higher perceived sustainability, or product life extension can be equally implemented to products of lesser environmental performance, resulting in increased net emissions). However, such negative effects are not considered to be so significant to offset the positive impacts obtained from the implementation of a particular business model.
- The impacts generated by sustainable business models result from a combination of policy factors as well as market decisions taken by private operators and consumers. However, the assessment of environmental impacts using the Exiobase model cannot quantify the relative impact of a specific policy measure (i.e., the attribution measure). Instead, it is assumed that any improvement potential exists because of the influence of policy support of the sub-options in this study.
- In the assessment of environmental impacts using the Exiobase model of all policy sub-options, a 5% environmental improvement potential has been assumed for those product groups and circular business models within the scope of SPI where no improvement factor has been identified in the literature.

³⁰⁶ https://circulareconomy.europa.eu/platform/sites/default/files/anti-waste_law_in_the_daily_lives_of_french_people.pdf

³⁰⁷ [Search the database - European Commission \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)

³⁰⁸ The ‘duty of care’ obligations has been introduced under its ‘Waste Management and Product Recycling Act’ (Kreislaufwirtschaftsgesetz – KrWG), which has recently entered into force <https://www.bmu.de/themen/wasser-abfall-boden/abfallwirtschaft/abfallpolitik/kreislaufwirtschaft/die-obhutspflicht-im-kreislaufwirtschaftsgesetz/>

7.2.2. *What problem(s) and specific objective(s) does this option address*

Policy option 6 is intended to primarily address sub-problem 1 (Product design does not sufficiently consider environmental impacts over the life cycle, including circularity aspects) by contributing – together with option 5 – to achieving the specific objectives 3 (Incentivise more sustainable products and business models to improve value retention). It also supports the specific objective 1 (Improve product sustainability) by addressing the market failure of ‘Markets for circular business models not fully developed’. This policy option is also related to a number of drivers arising from market, regulatory, and behavioural failures. Such drivers are related to insufficiently developed markets for circular business models and the behavioural failure associated to the persistence of linear production and consumption patterns are the default option being the most critical.

Stakeholders’ views on PO6

Evidence from the SME survey suggests that it is necessary to provide technical support and resources for the transition to a more sustainable production and consumption system. An EU wide platform for information and cooperation could be helpful to bring together different stakeholders and act as a key transition lever³¹⁰. This supports sub-option 6a with the development of guidelines for circular business models and an EU-wide hub for circular businesses.

It was highlighted that the European Commission should play more of a supportive than regulatory role for circular business models. There should be a promotion of producer ownership models with policy mixes of regulation and tax schemes, as they encourage sustainable products. It was also said that there should be safeguards that this model favours durable goods, which when broken or damaged, are eventually repaired. Additionally, the collaboration between suppliers, manufacturers and researchers should be promoted to stimulate circular solutions. The EC should fund research on consumer acceptance of new business models, their benefits and challenges, as the sustainable option should be more attractive and efficient for the consumer. There should also be minimum recycled content requirements. A logic of hierarchy should be applied to circular initiatives. Additionally, collection schemes should be improved to avoid repairable products being recycled.

SMEs also emphasised the importance of supporting democratic business models, such as worker cooperatives. It was noted that the democratization of businesses, by allowing workers to have a voice and vote in company boards or creating worker-owned cooperatives, can steer companies to more sustainable and equitable business conducts. Co-creation models where different actors in the value chain work together to design sustainable products were also mentioned.

An emphasis was also placed on empowering consumers to participate in do-it-yourself repair resources and providing them with the needed resources to do so, for example, open-source patents. Furthermore, building communities (e.g. digital) where consumers can be empowered to fix or re-purpose their products was mentioned several times. The need for democratic business models such as worker cooperatives was also highlighted.

The introduction of a ban on destruction of unsold products was also discussed with the SMEs as part of the survey. Stakeholders were asked to decide which circular business models would be most effective to decrease the amount of unsold goods in the EU. The majority of respondents think that fostering reconditioning and remanufacturing schemes would be an effective measure to decrease the amount of unsold products in the EU. In contrast, fostering a producer ‘duty of care’ received only about one-third of the number of responses of the most voted measure. 19% of respondents think that ‘boosting more

³¹⁰ IA SME Survey (2021)

sustainable business model such as on-demand production' would be a good way to decrease the amount of unsold goods. 16% of stakeholders think that 'selling damaged products at a discounted price' should be an additional measure taken to decrease the amount of unsold durable products. 'Fostering donation schemes' and 'Fostering greater transparency by producers regarding their product return rates and unsold products policies' received 14% and 14% votes respectively.

Moreover, to avoid the destruction of goods, stakeholders argue that there should be mandatory multi-criteria and labelling of products on resource efficiency. There should be repair requirements, including requiring producers/importers to allow repairs of their products to be done by independent repairers and guaranteeing supply of spare parts at a reasonable price for +10 years. There should also be mandatory minimum requirements on durability, reparability and recyclability of certain product categories (such as electronics/ICT equipment). Repair information should be readily available for customers online, with non-destructive disassembly required.

According to stakeholders' statements in the workshop dedicated to the Member State experts, the idea of additional EU-level guidance for MS on how to foster circular business models was deemed useful, as was the establishment of an information service on the subject. In general, there was support for the suggestion of an EU-wide prohibition on the destruction of unsold goods, but one participant underlined that this should be accompanied by the collection of more data on this issue at the European level.

7.3. Sub-option 6a: Promotion of value retention and value maximisation

7.3.1. Economic impacts

7.3.1.1. Administrative burden

Administrative burden for economic operators

The provision of guidelines and the creation of an EU wide hub would incur no administrative burden for economic operators. Economic operators as well as citizens would benefit from sub-options 6a measures to increase their knowledge on circular business models and develop circular initiatives, and they are expected to use them this knowledge to more frequently for their economic interactions deepen their economic interactions.

Businesses active in furniture, home appliances and packaging surveyed in the SPI stakeholder consultation (2) reported that the administrative impact would be no different in comparison to the baseline.

Administrative costs for the European Commission

The provision of guidelines on supporting circular business models can be managed internally or externalised to an agency or a contractor.

The costs associated to the set-up of a hub (6a2) depends very much on the final scenario selected. If the hub is to act as an online platform, managed as part of a wider dissemination activity on the SPI (e.g. following the Ecodesign website model), it is likely that the administrative cost will be limited to the cost of Commission personnel.

Management costs can also be shared with another existing platform, such as the Circular Economy Stakeholder platform for instance. The management can also be externalised, as if the

case for the European Cluster Collaboration Platform. The overall cost for this would have to be assessed on a more specific basis but can range annually between 80,000³¹¹, 200,000³¹² or five million Euros³¹³. Costs related to a real infrastructure development for this hub could be higher, in the order of several million Euros.

Administrative burden for Member States

No administrative burden is expected to be borne by MSs, unless the European Commission decides to delegate certain aspects of the guidelines on circular business models to existing agencies (e.g., the Enterprise European Network). In this case, a specific, specialized officer may be hired to manage the implementation of support measures for the development of circular business models. It is most likely that the measures will be enforced by an existing officer in the scope of his/her work on business development.

7.3.1.2. Direct economic impact for businesses

Impact on SMEs

The economic impact of this policy option is expected to be overall positive as the market for circular business is growing. Again, different circular business models have varied growth estimations. According to a recent study, the adoption of explicit policies to promote the circular economy will contribute to higher growth and employment levels in Europe by 2030. Compared to a baseline scenario, GDP will grow by almost 0,5% and there will be additional 700.000 jobs due to higher demand in waste management (in particular from recycling plants), repairs, product-as-a-service and rebounds in consumer demand from savings through collaborative actions (e.g., car and ridesharing).³¹⁴

The policy options will aim to further sponsor and raise awareness of those circular models with the most potential for growth. Indeed, research from the IA shows that while 9% of SMEs have already adopted Circular Business Models, on average 20% of businesses are already familiar with Circular Business Models³¹⁵. With the support from the public sector, there are good reasons to believe that circular economy business models will continue to increase.

Recent trends suggest that demand for Circular Business Models will continue to grow in future years, pushed by significant policy measures at EU and MS level, as well as generational trends and a growing appetite for sustainable products. Generation Z and Millennials are notably boosting demand for refurbished products and easy reparability options.

In the **textiles sector**, the second-hand apparel market is expected to double in 5 years with resale platforms driving the main growth. Between 2017 and 2019, global growth in Millennials' purchase of second-hand clothes and footwear grew by 36%³¹⁶. Adidas's used items are now planned to be taken back from the consumers, for which consumers receive vouchers that can be

³¹¹ Cost of personnel according to data transmitted by the European Commission for a contractual agent.

³¹² This was the total budget planned for the maintenance of the Circular Economy Stakeholder Platform.

³¹³ This was the total budget for the set up and maintenance of the European Cluster Collaboration Platform. The budget also foresees the payment of experts and matchmaking events.

³¹⁴ European Commission. Impacts of circular economy policies on the labour market <https://op.europa.eu/en/publication-detail/-/publication/fc373862-704d-11e8-9483-01aa75ed71a1/language-en>

³¹⁵ IA. SME survey. 2021

³¹⁶ McKinsey. The state of fashion 2019.

<https://www.mckinsey.com/~/media/mckinsey/industries/retail/our%20insights/the%20state%20of%20fashion%202019%20a%20year%20of%20awakening/the-state-of-fashion-2019-final.ashx>

used over 3 years³¹⁷. In June 2021, a French start up, Faune, raised EUR two million for its platform allowing major retail brands to commercialise second-hand products, including those products they were unable to sell³¹⁸. More recently, online retailer Zalando announced the creation of a second-hand apparel platform. Zalando aims to extend the life of 50 million items by 2023³¹⁹.

In the **ICT sector**, the global market for refurbished phones and laptops in 2017 was EUR 50 billion, expected to double to EUR 100 billion by 2022, as only ca. 15% of all privately-owned phones are recycled or refurbished. The global refurbished IT market growth reached 18% between 2017 and 2018³²⁰. In Europe, a decline in the demand for new smartphones runs parallel to an increase of the market of refurbished ones, which explains how second-hand electronics online retailer BackMarket recently raised EUR 276m to expand the global footprint of its marketplace for refurbished consumer electronics³²¹, currently comprised of 1,500 refurbishers and repairers (90% of them European).

Consolidated data on the economic impact of Circular Business Models at the EU level is scarce, but sectoral evidence as well as some information in MSs is available. According to an EU-level study, **servitisation** (see description of some innovative Circular Business Models) has the potential to increase annual turnover and number of clients³²². Although still in its early stages, the market for **circular reverse logistics** is expected to generate a strong economic impact with the surge of online sales, where 30% of products bought online are returned. One report demonstrated that the implementation of efficient and effective reverse logistics processes can reduce costs and help companies to recover significant shares of revenue³²³. The report argues that companies whose products are subject to regeneration can save up to 60 % of the estimated cost of a completely new product.

As for concerns SMEs, they are key to how change will materialise. Facilitating the incorporation of new and innovative circular business models, as well as offering more funding, tailor-made guidance and opportunities to collaborate within and across borders and while reducing red tape, will ensure that SMEs can reap the benefits of the circular economy and that no one is left behind in the transition³²⁴. Regulators should nevertheless be aware of some of the important barriers to entry in some circular markets for SMEs, particularly in the collaborative economy (e.g., car sharing and accommodation rentals). This should not stop SMEs from competing in the market. According to an EU-level study, servitisation brings a 1-10% increase in annual turnover to

³¹⁷ BOF. How Adidas Plans to Cash In on Old Clothes. <https://www.businessoffashion.com/articles/sustainability/how-adidas-plans-to-cash-in-on-old-clothes>

³¹⁸ Usine Digitale. Faune lève 2 millions d'euros pour aider les marques à créer leur site de seconde main. <https://www.usine-digitale.fr/article/faune-leve-2-millions-d-euros-pour-aider-les-marques-a-creeur-leur-site-de-seconde-main.N1114254>

³¹⁹ Corporate Zalando. <https://corporate.zalando.com/en/newsroom/news-stories/zalando-sets-out-revolutionize-pre-owned-fashion-europe>

³²⁰ European Economic and Social Committee. Identifying the impact of the circular economy on the Fast-Moving Consumer Goods Industry: opportunities and challenges for businesses, workers and consumers – mobile phones as an example https://circulareconomy.europa.eu/platform/sites/default/files/impact_of_ce_on_fmccg_-_mobile_phones_case_study.pdf

³²¹ Back Market Raises EUR 276 million to build a circular economy giant <https://sifted.eu/articles/back-market-raise-276m/>

³²² Technopolis, Dialogic and University of Cambridge for the European Commission. Study on the potential of servitisation and other forms of product-service provision for EU SMEs (2018)

³²³ The Benefits of Reverse Logistics, International Letters of Social and Humanistic Sciences, 26:138-147

DOI:10.18052/www.scipress.com/ILSHS.26.138.

April

2014

https://www.researchgate.net/publication/279742868_The_Benefits_of_Reverse_Logistics

³²⁴ Chambers for a Circular Economy, Actions to support SMEs' transition to a Circular Economy, 2020 <https://euagenda.eu/upload/publications/chambers-for-a-circular-economy-2020-2020-00016-01.pdf>

servitised SMEs in Europe³²⁵. Manufacturing SMEs report an increase of revenues as a result of introducing services, as well as the generation of new clients³²⁶.

Several businesses active in furniture, home appliances and packaging surveyed in the stakeholder consultation (2) reported that overall, there would be very low or no economic benefits for them at all. Costs are expected to be moderately lower than benefits. Operation and maintenance costs are expected to be no different compared to the baseline, as are capital expenditures and personal costs. No indirect costs were reported. One organization reported fully supporting the policy option, arguing that the EU can further support circular transformation through technology and innovation programmes where there is a need for industrial innovation. Building competences needed for the future EU generation was also considered necessary.

7.3.1.3. Indirect economic impact for businesses

Circular business models benefit from an improved brand image as a number of international businesses have already embraced closed-loop models. Businesses are using circular models to develop new, differentiated products and engage with their customers, particularly in textiles and electronics. Brands in high-street fashion (e.g., North Face, Patagonia, and H&M) and sportswear (e.g., Adidas and Puma) have developed new lines with reused materials. A study³²⁷ found that revenues from sustainable products and services grew at six times the rate of overall company revenues between 2010 and 2013, among the 12 members of the S&P Global 100 sampled.

Another less discussed indirect economic impact relates to issues of conformity and guarantee of reused/refurbished/repared products and their performance, particularly in the construction and ICT sectors. Possible additional costs related to the reuse of secondary raw materials for example could be generated for the producers. Producers could have to present a new label or proof of performance for their products to ensure that regulatory requirements are met, and that there are no health, life or insurance risks. Several studies argue that the average construction cost of a green building certification is between 1-9% higher than normal construction costs depending on the grade level required³²⁸. Nevertheless, green buildings on average are less costly to operate than traditional buildings (on average 10% less).

7.3.1.4. Economic impact for citizens

The promotion of circular business models would benefit citizens in several ways. Firstly, citizens would increase their awareness and knowledge of the variety of different ways to do business and to consider the value of products. This should inspire citizens to adopt sustainable consumption habits and behaviour patterns, as well as promote new sustainable services such as the sharing economy and lengthen product life cycles through reuse and repair. For example, repair cafés have become increasingly common globally, with close implications for citizens. In Germany alone, 860 repair initiatives were active in March 2021, proving that citizens see real

³²⁵ Technopolis, Dialogic and University of Cambridge for the European Commission. Study on the potential of servitisation and other forms of product-service provision for EU SMEs (2018)

³²⁶ Technopolis, Dialogic and University of Cambridge for the European Commission. Study on the potential of servitisation and other forms of product-service provision for EU SMEs (2018)

³²⁷ Harvard Business Review, The Comprehensive Business Case for Sustainability. <https://hbr.org/2016/10/the-comprehensive-business-case-for-sustainability>

³²⁸ Construction Cost of Green Building Certified Residence: A Case Study in Taiwan, Chen-Yi Sun, Sustainability MDPI, February 2019.

value in the generalisation of circular modes of business³²⁹. Secondly, such initiatives may encourage citizens to adopt different attitudes to products, and to consider circular business as a potential career path. As demonstrated in the social impact section, there is growing demand for workers in the circular economy.

7.3.2. Environmental impacts

Sub-option 6a is expected to have a positive environmental impact, however the exact magnitude of such positive environmental improvements attributable directly to the policy sub-option and for all product groups within the scope of SPI may vary, as explained with several examples cited in the literature.³³⁰ The environmental potential of circular business models is found to be broadly positive, as value retention activities extend product lifetimes, hence reducing material and energy requirements (and related impacts) from production of replacement products, whereas product-as-a-service and sharing models increase the optimisation and intensity of product use.

As far as the environmental impact of some well-known circular business models (see Markets for Circular Business Models are not fully developed) are concerned:

- **Remanufacturing:** some of the benefits typically associated to remanufacturing include a reduction of material consumption up to 80%, as well as product dematerialisation and decarbonisation. A study of the sector estimated 2.3 million tonnes of annual savings for landfilling avoidance and emission savings in the region of 8.3 million tonnes of CO₂eq for the EU-27.³³¹ In addition, several studies have identified a very large potential in terms of reduction of greenhouse gases, energy consumption, resource extraction and waste disposal.
 - For instance, remanufactured photocopiers are cited to generate a reduction between 19 to 25% in resource extraction, 27% in energy consumption, 23% in GHG emissions, and 35% in waste disposal reduction.³³²
 - As regards remanufactured turbochargers, energy (82%) and GHG emissions (73%) saving potentials have also been identified with LCA methods.³³³
 - In the case of remanufactured medical catheters, the impact in terms of global warming reduced by 50.4% and abiotic resource use is lowered by 28.8%.³³⁴
- **Reuse and repair** models: a study by the company CWS³³⁵ about the circularity and environmental impacts of its own yearly operations have been recently assessed including 555,000 protective garments products used in the manufacturing and hospitality sectors. This study identified environmental benefits equal to a 76% reduction in GHG emissions related to a service cycle of 555,000 pieces of blue wear, industrial

³²⁹ See the following website for an overview of all available repair measures in Germany: <https://www.reparatur-initiativen.de/orte>

³³⁰ SPI supporting study report

³³¹ ERN (2015), Remanufacturing Market Study, European Remanufacturing Network, <http://www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf>

³³² Kerr, W. and C. Ryan (2001), Eco-efficiency gains from remanufacturing, *Journal of Cleaner Production*, Vol. 9/1, pp. 75-81, [http://dx.doi.org/10.1016/S0959-6526\(00\)00032-9](http://dx.doi.org/10.1016/S0959-6526(00)00032-9).

³³³ Gao, W. et al. (2017), Investigation on the Comparative Life Cycle Assessment between Newly Manufacturing and Remanufacturing Turbochargers, *Procedia CIRP*, Vol. 61, pp. 750-755, <http://dx.doi.org/10.1016/j.procir.2016.11.214>.

³³⁴ Schulte, A., Maga, D., & Thonemann, N. (2021). Combining Life Cycle Assessment and Circularity Assessment to Analyze Environmental Impacts of the Medical Remanufacturing of Electrophysiology Catheters. *Sustainability*, 13(2), 898. <https://doi.org/10.3390/su13020898>

³³⁵ According to the study, with headquarters in Germany, CWS is active in 15 countries in Europe, employs around 11,000 people worldwide and has an annual turnover of more than EUR 1.1b. In Germany alone, CWS repaired more than 2.3 million workwear products and more than 600,000 already used items were returned to their service cycle in 2019.

clothes, catering & service and personal protective equipment. Assuming that each garment is subject to 46 cycles of washing during its service lifetime, the same study found that repairs reduce the environmental impact by 49.11 kilograms of greenhouse gas emissions per person per year, whereas the reuse of used garments reduces greenhouse gas emissions by 5.99 kilograms per person per year.³³⁶

- Some negative impacts have also been identified for reuse. Many examples are found in the literature of the beneficial reuse of standardised, unpowered products and components, and repairing an item is always found to be less energy intensive than new production. However, reusing a product does not guarantee an environmental benefit. Attention must be paid to restoring and upgrading old product efficiencies, minimising over-specification in the new application, and considering whether more efficient, new products exist that would be more suitable.³³⁷
- **Collaborative economy:** its environmental impacts can differ strongly per business model. In general, though, by increasing the utilisation of existing assets in the economy, the environmental impact of collaborative consumption is often lower than traditional alternatives. For instance, an LCA analysis of a collaborative platform for ski-related services in Hammarby Sjöstad (Sweden) has been recently conducted. The sharing model of skis, electric tools, cars, bicycles and cooking equipment, and the online platform have resulted in a reduction of 18-ton of CO₂eq compared to the baseline (20 tons of CO₂eq).³³⁸ As regards car sharing, global warming potential (GWP) savings between 4 to 20% were estimated as resulting from the replacement of 10 and 50% in the use of private cars, respectively.³³⁹ There are however growing concerns over side-effects of collaborative business models, which could have a negative environmental impact and offset the potential advantages³⁴⁰.
- Different PSS models will contribute differently to the environment.
 - The environmental impacts of Mobility-as-a-Service using electric scooters is estimated to reduce GHG emissions by 202 g CO₂eq / passenger-mile, caused by the resource extraction and manufacturing of scooters (50%) and daily collection for charging (43% of the impact).³⁴¹ An important source of the environmental impacts is caused by the very short life span of electronic scooters (e.g., they can last one month in use³⁴²). Moreover, not all models are designed for reparability and durability,³⁴³ and manufacturing occurring in overseas countries does not necessarily guarantee meeting strict environmental standards nor compliance with the avoidance of conflict minerals sourcing.

³³⁶ Jakob Tobias Steffen (2021): Circular Advantage Studie. CWS International GmbH. Duiburg.

³³⁷ Cooper, D. R., & Gutowski, T. G. (2017). The environmental impacts of reuse: a review. *Journal of Industrial Ecology*, 21(1), 38-56. <https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.12388>

³³⁸ Martin, M., Lazarevic, D., & Gullström, C. (2019). Assessing the environmental potential of collaborative consumption: peer-to-peer product sharing in Hammarby Sjöstad, Sweden. *Sustainability*, 11(1), 190. <https://doi.org/10.3390/su11010190>

³³⁹ Ding, N., Pan, J., Zhang, Z., & Yang, J. (2019). Life cycle assessment of car sharing models and the effect on GWP of urban transportation: A case study of Beijing. *Science of the total environment*, 688, 1137-1144. <https://www.sciencedirect.com/science/article/abs/pii/S0048969719326798>

³⁴⁰ European Commission. Environmental potential of the collaborative economy (2019)

³⁴¹ Hollingsworth, J., Copeland, B., & Johnson, J. X. (2019). Are e-scooters polluters? The environmental impacts of shared dockless electric scooters. *Environmental Research Letters*, 14(8), 084031. <https://iopscience.iop.org/article/10.1088/1748-9326/ab2da8>

³⁴² Shared scooters don't last long https://oversharing.substack.com/p/shared-scooters-dont-last-long?utm_medium=email&utm_campaign=cta

³⁴³ LIME (2020) Lime for a Sustainable Paris. A study on Lime's environmental impact in Paris 2018-2019. Lime. https://www.li.me/hubfs/Assets/LIME_ENG_Paris%20Sustainability%20Report_11OCT2019_RGB.pdf

- A study of the impact of pay-per-use washing machines in the Netherlands identified positive changes in consumer behaviour leading to a 2° Celsius (C) decrease in washing temperature (from 40 to 38°C), resulting in additional benefits in terms of energy savings and lesser frequency of washing per week (from 13 to 10 times a week on average).³⁴⁴ As a point of reference, it has been estimated that a reduction of the average wash temperature by 3°C in five European countries (France, Italy, Belgium, Denmark, and the UK) reduced the yearly energy consumption for laundry washing by 11.7% in 2013.³⁴⁵

7.3.3. Social impacts

The social impact of the policy measure is expected to be largely positive. Providing support for training in circular economy can open several employment opportunities in the market, particularly as some sectors lack skills and staff. For instance, the repair sector in France is understaffed, struggling to attract qualified people. As well as there being a lack of technical knowledge for repair, the sector is not considered very attractive (low wages)³⁴⁶. In the PSS sector, European SMEs undertaking servitisation are also limited by the number of people they can hire, listing the skill set of current staff and the difficulties in hiring staff with the right skills as a key barrier to their development³⁴⁷. 73% of SMEs however indicated to have hired additional employees after the introduction of product-service bundles³⁴⁸. Estimates for the UK show that a circular economy could create up to 50,000 new jobs in dismantling, recycling, organic treatment and in energy from waste facilities³⁴⁹.

Servitisation CBMs increase the affordability of more durable high-quality products as an alternative to low-cost, but less durable and less efficient products. For example, the Papillon project³⁵⁰ aims to combat energy poverty in Flanders by providing efficient household appliances on a leasing basis for €7 per month. An estimation of cost savings, based on the (average) energy consumption of the replaced old appliances and on the energy consumption (energy label) of the newly installed ones (over 10 years and based on the average Belgian electricity rate of 0,30 €/kWh) indicates savings of €804 for a fridge, €573 for a freezer, €321 for a washing machine, €564 for a tumble drier and €432 for a dishwasher.

Many circular economy enterprises are also engaging the socially excluded or vulnerable. This is true particularly in collection, sorting, repair, resale and upcycling operations, for example in textiles and food. Rreuse, the international network representing social enterprises active in re-

³⁴⁴ Bocken, N. M., Mugge, R., Bom, C. A., & Lemstra, H. J. (2018). Pay-per-use business models as a driver for sustainable consumption: Evidence from the case of HOMIE. *Journal of Cleaner Production*, 198, 498-510. <https://www.sciencedirect.com/science/article/abs/pii/S0959652618320109>;

³⁴⁵ AISE (2013) I prefer 30°. The case for the AISE low temperature washing initiative. Substantiation Dossier. International Association for Soaps, Detergents and Maintenance Products.

³⁴⁶ ADEME. Panorama de l'offre de réparation en France. (2018) <https://librairie.ademe.fr/dechets-economie-circulaire/1014-panorama-de-l-offre-de-reparation-en-france-actualisation-2018.html>

³⁴⁷ European Commission. Study on the potential of servitisation and other forms of product-service provision for EU small and medium-sized enterprises (2018) https://ec.europa.eu/growth/content/study-potential-servitisation-and-other-forms-product-service-provision-eu-small-and-medium_en

³⁴⁸ Technopolis, Dialogic and University of Cambridge for the European Commission. Study on the potential of servitisation and other forms of product-service provision for EU SMEs (2018)

³⁴⁹ The Circular Economy: Barriers and Opportunities for SMEs Vasileios Rizos, Arno Behrens, Terri Kafyeke, Martin Hirschnitz-Garbers and Anastasia Ioannou No. 412 / September 2015 https://www.greengrowthknowledge.org/sites/default/files/downloads/resource/GreenEconet_CEPS_SMEs_Circular_Economy.pdf

³⁵⁰ <https://www.bosch.be/news-and-stories/climatemattersatbosch-papillon-project/>

use, repair and recycling estimates that its members divert around 1 million tonnes of goods and materials every year from landfill and they extended the lifespan of 214 500 tonnes of products, leading to CO₂ savings equivalent to average emissions of approximately 108 000 EU citizens. Boosting such circular business models could present considerable opportunities to build skills and generate employment. Providing support for training in circular business models can open varied employment opportunities in the market, particularly as some sectors lack skills and staff. Proximity is important to a lot of circular activities. Membership-based social enterprise models (such as cooperatives, mutual, and associations) can provide a suitable structure for peer-to-peer initiatives such as sharing schemes, where access to services rather than returns on capital are the primary objective.

Circular business models usually operate under the same labor contracts as in the linear economy. As underlined in a report, unsafe work and a lack of minimum wage and social protection is one risk that can be traced to the logistics sector, particularly in retail and warehouses³⁵¹. While there have been no specific studies on the social impact of reverse logistics business models, there is evidence that road transport has one of the worst records in complying with social and labor law in Europe³⁵². Still, this likely results from insufficient enforcement and monitoring resources, which, if deployed, could limit the social drawbacks.

A study on the effects of the circular economy on labor suggests a strong trend in recycling and waste management (due to decreases in the demand of traditional waste management, e.g., landfilling), with the implicit assumption that better wages will be given to workers in the waste sector, linked to higher GDP and higher purchasing capacity³⁵³.

7.4. Sub-option 6b: Enhanced value retention and value maximization

7.4.1. Economic impacts

7.4.1.1. Administrative burden

Administrative burden for economic operators

Economic operators will have to comply with the transparency obligation and a ban on the destruction of unsold products introduced with one or a series of SPI measures for specific products or groups of products. The administrative burden of the transparency obligation is estimated to be limited since economic operators are given flexibility to disclose required information in a manner appropriate to their business environment, and in view of an exemption for SMEs. Economic operators may place the information on a publicly available website or they may disclose it by other means, for instance by including it in a publicly available management report. Reporting obligations to competent authorities, with heavier administrative burden for member states and economic operators are avoided. The requirement may lead to some administrative burden related to inventory management in order to collect the necessary information. However, it is expected that economic operators have most of the required

³⁵¹ Fair Trade Advocacy. Avoiding blind spots : promoting circular and fair business models. <https://fairtrade-advocacy.org/wp-content/uploads/2020/12/Circular-and-Fair-report.pdf>

³⁵² ETF. Social conditions in logistics in Europe: focus on road transport. https://www.wilke-maack.de/wp-content/uploads/2020/07/report_social_conditions_in_logistics.pdf

³⁵³ European Commission <https://op.europa.eu/en/publication-detail/-/publication/fc373862-704d-11e8-9483-01aa75ed71a1/language-en>

information already available at present. Economic operators are likely to keep account of the number of unsold products they discard for purposes of VAT deduction, to claim the VAT paid for imported products if these products end up being discarded instead of sold. As such, the main administrative burden associated with the measure is expected to relate to the actual act of information disclosure, such as creating and maintaining a dedicated space on a website to place this information.

To further limit administrative burden of the measure, the transparency obligation does not apply to SMEs. It is expected that this instrument is more effective as a disincentive when applied to large enterprises. In addition SMEs seem to cover a smaller market share of consumer products placed on the market. In e-commerce of consumer goods this is an estimated 12.76%³⁵⁴.

With regards to the ban, economic operators will incur some costs relating to value chain management and stock management (finding alternatives for returned products, for instance through donation or sale at a reduced price). Some administrative burden may also stem from transparency obligations on the fate of unsold products. The administrative burden depends on the product categories to which the ban on the destruction of unsold products will be applied, and under which conditions. This will be determined through a separate impact assessment.

Administrative costs for the European Commission

It is expected that the ban on the destruction of unsold products would incur some administrative burden for the European Commission for instance to develop the SPI measures and to coordinate relevant activities with Member States. A comparable Directive (94/62/EC) on packaging and packaging waste to reduce the consumption of lightweight plastic carrier bags) estimated that the administrative burden would be high for the European Commission³⁵⁵.

Administrative burden for Member States

It is envisaged to make the ban on destruction of unsold products directly applicable to economic operators. Although transposition in national legislation would thereby not be needed, monitoring and compliance verification by Member States can lead to a considerable administrative burden, depending on the scope of the SPI measure that introduces the ban on destruction of unsold products in practice.

7.4.1.2. Direct economic impact for businesses

The ban will lead to some important changes for businesses in terms of stock management and value chain management. To estimate the cost of the ban on businesses, it is necessary to look at the holding cost (warehouse costs, including insurance), and distribution cost (employee wages associated to moving the product and remarketing). The cost would depend on the product categories to which the ban on the destruction of unsold products will be applied, and under which conditions. This will be determined through a separate impact assessment. Exemptions are considered to ensure proportionality of the measure, for instance to prevent an inability to dispose of products while they are defective.

The economic impacts may in part be attributed to the cost of “dead inventory” or “dead stock”, which stands for the inventory that is not sold to the customers and has been stored for a specific period in e.g. warehouses. The bigger the dead inventories, the higher the costs for companies

³⁵⁴ As estimated based on Euromonitor data for e-commerce for 2021.

³⁵⁵ COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Reducing Marine Litter: action on single use plastics and fishing gear Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment SWD/2018/254 final - 2018/0172 (COD)

(stock, insurance, rent, administrative costs). The cost of dead inventories can represent 25-30% more than the inventories actual cost value³⁵⁶. In the US, dead inventory amounts to 50 billion dollars per year.

A ban on destruction of unsold products will require timely investments related to stocks, marketing and Human Resources to prevent dead inventory. The measure would provide a strong incentive to improve and innovate markdown planning, for instance in the fashion industry, to find an optimal balance between ensuring that as little stock as possible remains at the end of a season while minimizing the loss of revenue due to price reductions.

Considering the growing market for circular businesses models as well as the value of unsold products, there is reason to believe that net benefits may to an extent offset negative economic impacts of dead inventory. Companies can consider new business opportunities by creating markets for unsold products by remanufacturing them, or by collecting valuable unsold products and selling them at a reduced price. For instance, a business model found in the textile value chain is second-life retailing. This model, which is applied to both high-value and low-value textiles, is used to sell unsold stock lots and overruns and thus to give textiles a second chance. While the respective products are used instead of discarded, customers benefit from low prices. This model uses reverse logics not to bring back products to their point of origin, i.e., manufacturing, but to other retail channels³⁵⁷.

In case unsold products are donated instead of destructed, some negative economic impacts may be incurred by businesses due to tax reasons. Donation of unsold products by economic operators (e.g. importers) forfeits the right to deduct VAT paid to tax authorities upon acquiring of these goods. In the case of destruction, economic operators do have a right to deduct VAT. The disposal cost of a product averages at EUR 0.85 per item. In addition, small dealers in particular indicate that it would be too time-consuming to select a suitable donation organisation.

Compliance cost may differ per company depending on the extent to which destruction of unsold products actually occurs. For instance in Germany, online retailers such as Zalando claim to already comply with the German duty of care³⁵⁸ which requires companies to ensure, when distributing products, that they do not become waste. Zalando has a return rate of around 50% and claims that almost all of its returned articles (97%) are sold again via the shop or outlet stores³⁵⁹. Just 0.05% of the items is said to be destroyed due to necessity.

As for SMEs, they generally have more limited financial and human resources available to adapt to important legislative changes. However, the ban on destruction of unsold goods, including transparency requirements will primarily have an impact on those organisations that are known to hold very large quantities of unsold goods. The SPI measure may exclude targeted economic operators, for instance by focusing on large companies and all companies listed on regulated markets (except listed micro-enterprises) holding unsold products in the EU covered by the SPI measure. This could be considered in order to ensure proportionality of the measure.

Businesses active in furniture, home appliances and packaging surveyed in the SPI stakeholder consultation reported that there would be very low or no economic benefits for them with the implementation of a ban on destruction of unsold goods. One requested further clarification with

³⁵⁶ What Is The Real Cost Of Dead Inventory? <https://www.manufacturing.net/home/article/13117104/what-is-the-real-cost-of-dead-inventory>

³⁵⁷ Second-life retailing: a reverse supply chain perspective. March 2016 *Supply Chain Management* 21(2):259-272 https://www.researchgate.net/publication/298429830_Second-life_retailing_a_reverse_supply_chain_perspective

³⁵⁸ The duty of care in the Circular Economy Act | BMU

³⁵⁹ Ecommerce News. Germany makes destroying products more difficult. February 12, 2020

respect to the implementation of the ban, regarding the definition of the destruction of unsold goods, the interlinks with product safety and waste legislation. They considered that parallel regulatory amendments would be necessary to support such a policy option in the area of taxation favouring circular business models. Stakeholder views varied with respect to impacts on operation and maintenance costs: one business found there were no changes expected in comparison to the baseline, while another found that personal costs (OPEX) would increase by less than 1%, and operation and maintenance costs between 1-5%. Impacts for businesses in specific product categories will be further assessed in the impact assessment of implementing measures that introduce the ban on destruction of unsold goods, where applicable.

7.4.1.3. Indirect economic impact for businesses

It is foreseen that the indirect impact will overall be positive. Companies choosing to invest in circular models, such as reverse logistics or leasing services which prevent product surpluses, are expected to generate an increase in revenues. Indeed, one report demonstrates that the implementation of efficient and effective reverse logistics processes can reduce costs and help companies to recover significant shares of revenue³⁶⁰. Companies transitioning towards circular practices will improve their brand image, particularly if they engage in more regular donations or pledge to reduce the volumes they buy. The indirect impact is foreseen to be positive overall.

7.4.1.4. Economic impact for citizens

The ban on destruction of unsold products will make alternatives to destruction, including sale at reduced prices and donation, more attractive. This could make products economically more accessible for consumers with a lower purchasing power. Such impacts may differ on a product by product basis and will be further assessed in the impact assessment of implementing measures.

7.4.2. *Environmental impacts*

Increasing evidence is available on the magnitude of waste generated in certain sectors through the destruction of unsold goods. Such unsold products are either recycled, incinerated or sent to landfill. In the German online and mail order business, it is estimated that almost four percent of the returned products are disposed of, which corresponds to around 20 million items per year³⁶¹. In France, government estimates on the yearly destruction of products vary from EUR 630M to EUR 800M³⁶². Jewellery and watch brands Cartier, Piaget, and Baume & Mercier, admitted that in an effort to keep its products out of the hands of unauthorized sellers, it had destroyed about \$563 million worth of watches over the past two years. A ban on the destruction of unsold products will reduce the amount these products being discarded, and thereby reduce CO₂ emissions from waste treatment operations. Positive environmental impacts may also stem from improved stock management with possible reductions in production surpluses as a result.

There are currently no available complete estimations on the total amount of unsold products being destructed in the EU. In some sectors, such as textiles or electronics, estimations have been

³⁶⁰ The Benefits of Reverse Logistics, International Letters of Social and Humanistic Sciences, 26:138-147

DOI:10.18052/www.scipress.com/ILSHS.26.138. April 2014

³⁶¹ Universität Bamberg, Retouren: Warum 20 Millionen Artikel vernichtet werden <https://www.uni-bamberg.de/presse/pm/artikel/retourenvernichtung-asdecker-2019/>

³⁶² Impact Assessment of the French circular economy law elaborates on expected benefits of such instrument. Ex ante impact assessment of the French AGEC Law (2019). <https://www.senat.fr/leg/etudes-impact/pjl18-660-ei/pjl18-660-ei.html>

made on the total amount of unsold products destroyed. One economic operator in the online retail sector reportedly destroys 3 million unsold products per year in France, but it is not possible to say which percentage of that refers to books, perfume, or textiles³⁶³. Consequently, it is not possible to estimate how many tons of additional CO₂ are emitted in the atmosphere as a result of unsold goods.

In the fashion industry, the production of textiles is responsible for 10% of global carbon emissions. According to the European Environment Agency, textile purchases in the EU in 2017 generated about 654 kg of CO₂ emissions per person. Preventing the destruction of these products could reduce this impact. The reuse or recycling (although recycling also counts as destruction) of unsold textiles alone will save 250,000 t/year of CO₂, equivalent to the emissions of 125,000 cars per year³⁶⁴. France estimates that for textiles, on a market of about 600,000 tonnes of textile every year³⁶⁵, the upcoming ban on destruction of unsold products could avoid the destruction of 10,000 to 20,000 tonnes of textile a year³⁶⁶ (1.7% to 3.4%).

7.4.3. *Social impacts*

Foreseen social impacts will be largely positive if companies increase their donations to social enterprises as a result. Estimations regarding the percentage of donated products are usually company specific and not available per sector. It has been estimated in Germany that in almost 40% of the cases, it would be theoretically possible for retailers to donate the goods, provided that a recipient can be found. That affects 7.5 million articles per year. Donation or sale at reduced prices instead of destruction could have a positive social effect, making products more accessible for a segment of the population³⁶⁷.

The working conditions of workers employed in reverse logistics and in the handling of stock management and returns should be surveyed closely. In Europe, several unions have gone on strike to protest against poor working conditions. The implications of such a ban on the working conditions of those handling returned items and stock management should not be ignored.

7.5. Impacts on third countries

The provision of guidelines to support Circular Business Models, the deployment of a hub and the ban on unsold products (see sub-options 6a.1, 6a.2 and 6b) are done in a non-discriminatory way. No adverse trade effects are expected vis-à-vis trading partners.

The ban on the destruction of unsold consumer products (sub-option 6b) could have a potential negative impact on third countries. Research has pointed to the social and environmental problems caused by donated products in developing countries, particularly electronics. The issues raised refer to corruption, creating dependency on donations and the absence of waste treatment channels available to deal with the end of life of such products. According to the World Bank, in

³⁶³ Huffington Post, *Selon « Capital », Amazon a jeté plus de 3 millions d'invendus en France* (2019). https://www.huffingtonpost.fr/2019/01/12/selon-capital-amazon-a-jete-plus-de-3-millions-dinvendus-en-france_a_23640921/

³⁶⁴ French Ministry of Environment 2020, *Textile usagés*, <https://www.ecologie.gouv.fr/textiles-usages>

³⁶⁵ French Ministry of Environment 2020, *Textile usagés*, <https://www.ecologie.gouv.fr/textiles-usages>

³⁶⁶ French Ministry of Environment 2020, *The anti-waste law in the daily lives of the French people*

³⁶⁷ Universität Bamberg, *Retouren: Warum 20 Millionen Artikel vernichtet werden* <https://www.uni-bamberg.de/presse/pm/artikel/retourenvernichtung-asdecker-2019/>

low-income countries, over 90% of waste is often disposed of in unregulated dumps or openly burned.³⁶⁸

³⁶⁸ World Bank. Solid waste management. <https://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management> Last updated September 23rd 2019.

7.6. Summary of impacts

Table 55 Administrative burden of PO6

| <i>Administrative burden Option 6</i> | | | | | |
|---------------------------------------|----------------|---|---|---|---|
| | | Businesses | | Administrations | |
| | | One-off | Recurrent | One-off | Recurrent |
| Sub-option 6a | Direct costs | +/- No direct costs estimated for businesses | +/- No direct costs estimated for businesses | - Hiring of personnel Design and development of a platform or website | - Staff costs Platform or website maintenance |
| | Indirect costs | n.a. | n.a. | - Possible indirect costs related to public procurement | n.a. |

| | | | | | |
|----------------------|----------------|------|-----|---|---|
| Sub-option 6b | Direct costs | --- | --- | - | - |
| | Indirect costs | n.a. | | | |

| | | | | | |
|--|---------------------------------------|-------|--|---|----------------------------------|
| | Value chain and management adaptation | stock | Storage costs (warehouse costs, including insurance) | Set up of the implementing acts (European Commission) | Enforcement and compliance costs |
| | | | Distribution costs (employee wages associated to moving the product and remarketing) | Enforcement of the SPI acts (MSs) | |

Table 56 Economic impacts of PO6

| <i>Economic impacts</i> | | | |
|---|--------------------------------|-----------------|---|
| <i>Description</i> | <i>Amount/ qualitative</i> | | <i>Comments</i> |
| | <i>Option 6a</i> | <i>Option6b</i> | |
| <i>Direct impacts</i> | | | |
| Increased revenues for companies developing circular products or services | + | ++ | <p>According to an EU-level study, servitisation brings a 1-10% increase in annual revenues to servitised SMEs in Europe³⁶⁹. Manufacturing SMEs report an increase of revenues as a result of introducing services, as well as the generation of new clients.</p> <p>Almost all circular business models studied in the framework of the IA could benefit from a ban on the destruction of products. A pattern found in the textile value chain is second-life retailing. This model, which is applied to both high-value and low-value textiles, is used to sell imported stock lots and overruns, giving textiles a second chance.</p> |
| Circular businesses gain larger market shares | + | ++ | <p>A study³⁷⁰ found that revenues from sustainable products and services grew at six times the rate of overall company revenues.</p> <p>In the ICT sector, where the global market for refurbished phones and laptops in 2017 was €50 billion, expected to double to €100 billion by 2022, i.e., only ca. 15% of all privately-owned phones are recycled or refurbished³⁷¹. The global IT refurbished market growth accounted for 18% of growth between 2017 and 2018. In Europe, a decline in the demand for new smartphones runs parallel to an increase in the demand for refurbished ones.</p> |
| Increased stock management and value chain management cost | +/- | -- | <p>The ban on destruction of unsold products will lead to cost increases for businesses in terms of stock management and value chain management. Costs include warehouse costs, including insurance, and distribution cost such as employee wages associated to moving the product and remarketing. The adaptation to the ban may incentivize innovation in stock management. This may require initial investments, but could lead to savings in the long run.</p> |

³⁶⁹ European Commission, Study on the potential of servitisation and other forms of product-service provision for EU SMEs (2018) <https://op.europa.eu/en/publication-detail/-/publication/0d1ed8aa-8649-11e8-ac6a-01aa75ed71a1/language-en>

³⁷⁰ Harvard Business Review, The Comprehensive Business Case for Sustainability. <https://hbr.org/2016/10/the-comprehensive-business-case-for-sustainability>

³⁷¹ European Commission, Actions to scale-up Value Retention Process Business Models for Consumer Products

G7 Alliance on Resource Efficiency Workshop Report

https://ec.europa.eu/environment/international_issues/pdf/G7VRP_Workshop_report.pdf

| <i>Indirect impacts</i> | | | |
|-------------------------|----|-----|--|
| Improved brand image | ++ | +++ | A number of international businesses having already embraced closed-loop, circular business models have benefited from improved brand image. Businesses are using circular models to develop new, differentiated products and engage with their customers, particularly in textiles and electronics. High-street fashion (e.g., North Face, Patagonia and H&M) and sportswear (e.g., Adidas and Puma) brands have all developed new lines with reused materials. |

Table 57 Environmental impacts of PO6

| <i>Environmental impacts</i> | | | |
|--|---------------------------|------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | <i>Comments</i> |
| | <i>Option 6a</i> | <i>Option 6b</i> | |
| <i>Direct impacts</i> | | | |
| Decrease of GHG emissions | + | ++ | It is not currently possible to estimate how many tons of additional CO ₂ are emitted in the atmosphere as a result of destruction of unsold goods. However, it is clear from numerous studies that disposal contributes to climate change due emissions of waste treatment operations. The manufacturing of product surpluses also releases large amounts of CO ₂ . Direct impacts depend on the product scope of implementing measures and will be further assessed through a dedicated impact assessment. |
| Less waste being burned or going to landfill | + | +++ | According to a study by PRO EcoTLC and RDC Environment, the disposal of 1 kg of textile with household waste generates 1.4 kg of CO ₂ , whereas its disposal through the recycling sector saves 25 kg. The reuse or recycling of unsold textiles (although recycling would be covered by the ban on destruction of unsold goods) alone will save 250,000 t/year of CO ₂ , equivalent to the emissions of 125,000 cars per year. |
| <i>Indirect impacts</i> | | | |
| Consumers adapt their modes of consumption | ++ | +++ | Through increased awareness on circular business models it is expected that consumers will adapt their consumption patterns. According to the 2017 Eurobarometer survey, a majority of Europeans think that protecting the environment is very important to them personally. The same survey showed support on the part of citizens for stricter legislation to tackle environmental problems. |

Table 58 Social impacts of PO6

| <i>Social impacts</i> | | | |
|--|---------------------------|------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | <i>Comments</i> |
| | <i>Option 6a</i> | <i>Option 6b</i> | |
| <i>Direct impacts</i> | | | |
| Employment opportunities | + | + | Providing support for training in the circular economy can open varied employment opportunities in the market. Estimates for the UK show that a circular economy could create up to 50,000 new jobs in dismantling, recycling, organic treatment and in energy from waste facilities ³⁷² . The repair sector in France is understaffed, struggling to attract qualified people ³⁷³ . As well as there being a lack of technical knowledge for repair, the sector is not considered very attractive (low wages). In the PSS sector, European SMEs undertaking servitisation are also limited by the number of people they can hire, listing the skill set of current staff and difficulties in hiring staff with the right skills as key barriers to their development. |
| Positive effects on training and (re)skilling | ++ | ++ | Increasing the circularity in the economy by upskilling both the workforce and society is necessary to enable new social practices. Closing the skills gap can lay the groundwork for unfolding the potential of new economic and technological solutions as well as infrastructures in a better way. Appropriate vocational education and training measures and innovative learning arrangements are needed to bridge the skill gap ³⁷⁴ . |
| Increase in second-hand products and donations | + | ++ | A growing market for second-hand products could have a positive social effect, making products more accessible for underprivileged segments of the population. Donations and sale of products at reduced prices as a result of the ban on destruction of unsold products should also improve the living conditions of citizens living in precarious environments. |

³⁷² The Circular Economy: Barriers and Opportunities for SMEs. Vasileios Rizos, Arno Behrens, Terri Kafyeke, Martin Hirschnitz-Garbers and Anastasia Ioannou No. 412 / September 2015

³⁷³ ADEME, Panorama de l'offre de réparation en France : actualisation 2018 <https://librairie.ademe.fr/dechets-economie-circulaire/1014-panorama-de-l-offre-de-reparation-en-france-actualisation-2018.html>

³⁷⁴ Circle economy. Closing the skills gap :vocational education and training for the circular economy. https://assets.website-files.com/5d26d80e8836af2d12ed1269/608c0aa6fec4df0fa7bd78e4_20210422%20-%20CJI%20VET%20Paper%202%20-%20297x210mm.pdf

| <i>Indirect impacts</i> | | | |
|--------------------------|---|---|---|
| Better wages for workers | + | + | A study on the labour effects of the circular economy provides useful data that suggest a strong trend in recycling and waste management (due to a decreasing demand in traditional waste management, e.g., landfilling), with the implicit assumption that better wages will be granted to workers in the waste sector ³⁷⁵ , linked to higher GDP and higher purchasing capacity. |

8. OPTION 7: STRENGTHENED APPLICATION OF THE ECODSIGN FRAMEWORK

8.1. Overview

Overview of Policy Option 7

Policy Option 7 is built around a strengthened application of the Ecodesign framework. Its three sub-options consist of an improvement of the current framework mainly addressing its efficiency (7a), additional strengthening enforcement, specifically relating to market surveillance (7b), and the creation of complementary EU-level implementation and enforcement support capacities. The sub-options are summarised in the box below.

Sub-option 7a: Improve the current framework to increase efficiency

- Measure 7a1. – Streamline the procedures for the development and adoption of Ecodesign implementing regulations
- Measure 7a.2 – Introduce the possibility to collect data from manufacturers and retailers regarding regulated products sales and usage
- Measure 7a.3 – Add provisions related to third party certification

Sub-option 7b: Strengthen market surveillance of EU Member States

This option includes all the measures provided for under sub-option 7a, plus:

- Measure 7b1 – Make relevant product information digitally available to Market Surveillance Authorities
- Measure 7b2 – Structural technical support to improve cooperation between Market Surveillance Authorities and ensure sufficient capacities
- Measure 7b3 – Organise common trainings for staff of notified bodies, notifying authorities and Market Surveillance Authorities
- Measure 7b4 – Publish penalties decisions issued by Market Surveillance Authorities
- Measure 7b5 – Create a benchmark and a reporting obligation for Member States
- Measure 7b6 – Establish requirements for market surveillance checks

³⁷⁵ European Commission <https://op.europa.eu/en/publication-detail/-/publication/fc373862-704d-11e8-9483-01aa75ed71a1/language-en>

Sub-option 7c: Reinforce EU level implementation and complement Member States' market surveillance

This option includes all the measures provided for under sub-option 7b, plus:

- Measure 7c1 – Complement national market surveillance where needed
- Measure 7c2 – Products monitoring and testing facilities
- Measure 7c3 – Assistance to implementation for suppliers and Market Surveillance Authorities
- Measure 7c4 – Third party channel for market surveillance

8.1.1. Assumptions used in the analysis

- The environmental improvement potential of the strengthened application of the Ecodesign framework mainly arises from process optimisation and an improved information base, allowing for a faster and more effective setting of requirements. In addition, increased and improved market surveillance is expected to reduce non-compliance and thereby decrease lost benefits.
- The proposed measures generally increase costs on businesses, but an improved level playing field (e.g. through reduced non-compliance) could counteract that to a certain extent. Similarly, administration costs will increase, though efficiency improvements will counteract that to a certain extent.

8.1.2. What problems and specific objectives does this option address

This option addresses the problem of “sub-optimal application of the current Ecodesign legislation”, contributing to the specific objectives “improve products sustainability” and “improve application of sustainable product legislative framework”.

Sub-option 7a addresses the efficiency and speed of the Ecodesign regulatory process, while sub-option 7b addresses its effectiveness through improved market surveillance, which also contains elements increasing the efficiency of the process. Sub-option 7c introduces the possibility for autonomous market surveillance by the Commission, assistance to suppliers and Market Surveillance Authorities as well as a third-party channel for market surveillance.

Stakeholder views

Overall, the majority of the stakeholders were satisfied with the Ecodesign Directive legislative process (58%). The prioritisation of the most important improvements are as follows:

1. Increase Commission staff resources;
2. Publish measures as they come and not by package;
3. Better align with the Better Regulation Framework;
4. Merge preparatory studies with IA and/or run consultations in parallel (stakeholder meetings, consultation forum, OPC); and
5. Do not halt process when objections are being raised.

The greatest improvement potential in the Ecodesign process is perceived in conducting preparatory/review studies, followed by the impact assessment on draft measures/proposed voluntary agreement, the Consultation forum process and, lastly, the preparation of the working plan. Stakeholders stressed the importance of increasing transparency, setting clearer timelines/deadlines/milestones, providing more clarity on the reasoning behind the selection of products and better responding on the how and why of stakeholder comments are being taken into account. In the preparatory phase (i.e. working plan, prep study and impact assessment), stakeholders still see a potential to be more involved, considered and informed.

A diverse set of stakeholders confirmed the concerns related to market surveillance. There is a general call for market surveillance to be improved, both in terms of clearer and harmonised regulation, and enforcement improvements. Many stakeholders commented on the lack of resources (funding and trained staff) and testing capacity in Member States. Notably, some stakeholders mentioned that surveillance and reporting need to be more open to the public. Digital tools were noted to be potentially useful to create more transparency. Further, SMEs participating in the OPC considered setting verification targets for products that are most likely to be non-compliant, as well as creating a central reporting point/website to enable consumer feedback, important.

There is a significant funding gap at MS level for Market Surveillance Authorities. There is also insufficient competent staff and testing capacity at MS level. Training for authorities is needed to ensure a common understanding of responsibilities. Funding should be increased and verification targets should be improved for Market Surveillance Authorities. There should also be consistent checks across MS. Digital passports are a suggested solution for more efficient checks. Additionally, it was suggested that Civil Society Organisations should be able to initiate non-compliance proceedings with Market Surveillance Authorities. SMEs were in particular in favour of supporting measures from the Commission to MSs, such as guidance and carrying out complementary market surveillance where needed.

8.2. Baseline for PO7

Until now, the implementation of the Ecodesign Directive has shown achievements and impact, but its entire potential has not been harnessed due to a number of factors, such as:

- Delays in adopting Ecodesign measures caused by lack of resources at the Commission level, as well as by the turnover of the staff dealing with the Ecodesign Directive.
- Reduced effectiveness of the framework due to manufacturers' non-compliance;
- Difficulties encountered by Market Surveillance Authorities in performing proper surveillance;
- Insufficiency of EU resources for supporting national Market Surveillance Authorities in improving regulatory enforcement.

It was highlighted that certain structural changes including working methods and interaction with MSs and stakeholders will be necessary to streamline policy development and implementation.

The current problems will persist and might be further exacerbated in case no specific interventions are introduced in the coming years. The problems and challenges observed with the implementation of the Ecodesign Directive will continue to prevent it from reaching its full potential.

In 2019³⁷⁶ the Commission estimated that inadequate market surveillance had led to between 10 and 25% of products on the market failing to meet the Ecodesign requirements, resulting in a loss of approximately 10% of envisaged environmental benefits. The new general Market Surveillance Regulation could increase effectiveness through e.g., improved general coordination and empowerments for Market Surveillance Authorities. However, the regulation is not specific to the challenges of Ecodesign enforcement (i.e. it covers mainly instruments focused on product safety rather than sustainability) and does not specifically address the lack of resources dedicated to Ecodesign enforcement. The current shortage of administrative capacities to ensure effective deployment of market surveillance mechanisms will likely persist. Therefore, insufficient market surveillance could continue compromising the competitiveness of compliant producers by

³⁷⁶ European Commission 2019 New energy efficiency labels explained, link: https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596

distorting fairness of competition with non-compliant products. In regards to this, many stakeholders are concerned with the competitiveness of sustainable products suppliers due to the unfair competition from non-compliant products suppliers:

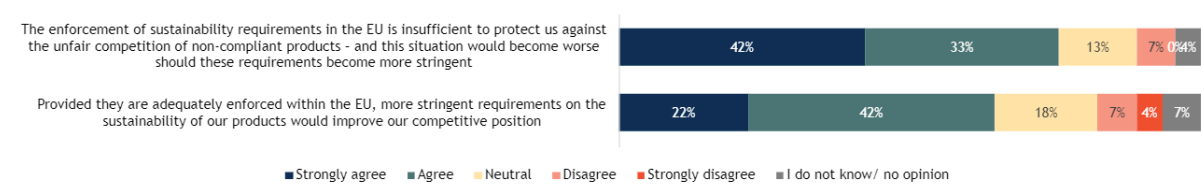


Figure 4 Stakeholder views on competitiveness aspects related to a strengthened application of the Ecodesign framework

In the ‘no SPI’ scenario, the administrative burden for the Commission, MSs and the industries related to the Ecodesign Directive will in principle remain at the current level (but could increase if new products will be regulated under it). The administrative and compliance costs for manufacturers differs between implementing measure for different products. The current annual administrative cost for each MS in relation to the current Ecodesign measures ranges, according to the interviewed stakeholders, between EUR 200 000 to EUR 1 million³⁷⁷. In the ‘no SPI’ scenario, towards 2030 the administrative and compliance cost should in principle remain constant (but could increase if new products will be regulated under it).

8.3. Sub-option 7a: Improve the current framework to increase efficiency

8.3.1. Economic impacts

8.3.1.1. Administrative burden

Administrative burden for economic operators

Increased data availability will likely measures that are easier to implement, thus decreasing the administrative burden. Additional data provision requirements for manufacturers, on the other hand, will likely slightly increase their cost burden.

The measure related to third-party conformity assessment will, if applied to specific product requirements, likely increase costs for businesses since they will not be able to rely on self-declaration for those requirements and would have to pay for the services of notified bodies.³⁷⁸ The exact cost estimation will depend on the specific procedure identified in product-specific regulations, which in turn will depend on the nature of the relevant requirements. The impact assessment of the recently adopted Market Surveillance Regulation estimated average costs for conformity assessment procedures and relevant documentation applicable to specific kinds of electric motors to amount to approximately 0.3% of the revenues of companies.³⁷⁹ The procedure chosen should specifically take into account impacts and proportionality for SMEs.

Administrative costs for the European Commission

The streamlining of the Ecodesign process and the increased availability of data under sub-option 7a is expected to decrease the costs per regulation for the Commission. The Commission will have to invest once in optimising the process, but the resulting savings will likely exceed this investment after several product regulations. Furthermore, additional availability of data from

³⁷⁷ according to the consultations with MSs conducted under this impact assessment

³⁷⁸ This was recognised in the 2015 review of the Energy Labelling Directive (2010/30/EU) and the Ecodesign Directive: “The main drivers for the burden for manufacturers are third party certification (options 2 and 3) and the extension of the scope to non-energy related products (option 3).”, SWD(2015) 139 final

³⁷⁹ EUR-Lex - 52017SC0466 - EN - EUR-Lex (europa.eu)

manufacturers will likely reduce administrative effort and further reduce the cost of preparatory studies. At the same level of complexity, therefore, a preparatory study will be less costly (including the cost for consultants).

Administrative burden for Member States

There will be some additional burden for MSs in so far as product-specific regulations prescribe the use of third-party conformity assessment in relation to specific requirements. In that case, costs will be associated with the assessment and surveillance of the competence and independence of notified bodies by notifying authorities. This will, however, could be balanced by possible reduced surveillance costs associated with the physical testing of products.

8.3.1.2. Direct economic impact for businesses

Although businesses will have to bear the costs for third-party conformity assessment, in case it is made compulsory for some products before placing them on the market, this will also likely lead to decreased non-compliance for those products leading to a more level playing field and increased business opportunities for compliant products.

8.3.1.3. Indirect economic impact for businesses

No indirect economic impacts are expected for businesses.

8.3.1.4. Economic impact for citizens

The economic impact for citizens stemming from the efficiency improvement of the Ecodesign framework in sub-option 7a consists of additional savings (in terms of energy demand reductions, but also for example increased durability and reparability of products) associated with the increase in the number of product regulations that can be processed with the same resources. Due to efficiency improvements through shorter lead times and more readily available and reliable market data, consumer savings would increase. The consumer expenditure is the combined expenditure for the purchase of products, the energy costs during usage, and for some products, the water costs during usage and/or installation and maintenance costs. The savings realised will depend on the product groups covered and the exact requirements imposed. Based on the 2015 Impact Assessment on the Review of the Energy Labelling Directive and the Ecodesign Directive³⁸⁰, we can estimate a minimum of around EUR 3 billion annually.

8.3.2. Environmental impact

The process for the adoption of Ecodesign requirements for a product category is currently long and subject to avoidable delays³⁸¹ and this leads to regulations based on data and information that could be outdated. The improvement of the Ecodesign framework envisioned under sub-option 7a is likely to reduce adverse environmental impacts, due to a number of factors. First, it will be possible to process product regulations (including reviews) faster, thus to a certain extent limiting delays that represent missed opportunities. The possibility to collect sales and usage data would speed up, facilitate, and/or improve the quality of preparatory studies, as large parts of them consist of data collection. Second, the new process would also allow more parallel work and

³⁸⁰ SWD(2015) 139 final, EUR 8.1 billion consumer savings is estimated for measures that include addressing the length of the process and low ambition of measures but also some issues that are tackled by other measures of the current Impact Assessment (i.e., joint market surveillance actions and non-energy environmental impacts), or not at all. By subtracting their estimated contribution we derive the figure quoted in the text.

³⁸¹ The process is planned to take roughly 40-42 months. It sometimes takes twice as long as planned (i.e. 84 months). See also 'EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance', Special Report 01, January 2020, European Court of Auditors

better involve stakeholders. Third, better data and synergies with other regulations will increase the quality of the work and enhance the impact of the regulations accordingly.

The introduction of provisions related to third party certification will – where applied – contribute to a reduction of the risk of non-compliance as can be observed, for example, with the Construction Products Regulation.³⁸²

The measures under sub-option 7a are estimated to shorten the process by 4-6 months and may prevent further delays. A streamlined process would mean that the requirements for unregulated products (or for reviews of regulated ones) would apply earlier and would force manufacturers to start reducing the environmental impacts of their products earlier, contributing thus to a bigger overall reduction of negative environmental impacts.

8.3.3. *Social impacts*

The social impacts of this sub-option are more difficult to estimate than the environmental and economic impacts. A strengthened role of third-party conformity assessment may increase employment opportunities in this sector.

8.4. Sub-option 7b: Strengthen market surveillance by Member States

8.4.1. *Economic impacts*

8.4.1.1. **Administrative burden**

Administrative burden for economic operators

The digital provision of product data to Market Surveillance Authorities will increase the administrative burden for businesses. In so far as the required information exists (i.e., due to existing Ecodesign requirements or new ones) the administrative burden of registering products to e.g. a database will be minimal and only related to clerical work. The 2015 Impact Assessment on the Review of the Energy Labelling Directive (2010/30/EU) and the Ecodesign Directive has estimated this cost to be EUR 1.5 million per year for the entire industry for products in the current scope (i.e., energy-related products). In so far as the digital provision of information would be realised through the Digital Product Passport presented under Option 4, cost estimates are provided therein.

Administrative costs for the European Commission

Structural technical support to improve cooperation between Market Surveillance Authorities and to ensure sufficient capacities will likely permanently increase costs for the Commission. Common training for staff of notified bodies, notifying authorities and Market Surveillance Authorities will also increase the administrative burden of the Commission. The setup of the benchmark and reporting obligation for MSs and the establishment of requirements for market surveillance checks will likely create a small administrative burden on the Commission during setup.

Costs will derive from the need for additional staff to implement and organise technical support, training, benchmarking, and potential requirements. It is assumed this will require 2 additional FTE.

³⁸² European Commission (2019). Special review study: Assessment of appropriateness of a third party conformity assessment procedure for solid fuel boilers and solid fuel local space heaters: https://drive.google.com/file/d/1-NcEksnpUIVQbAxkO4JGu6Gn14ZQ_lhq/view

In addition, funding will be needed to finance joint market surveillance and testing projects and Union testing facilities.

Administrative burden for Member States

Structural technical support to improve cooperation between Market Surveillance Authorities will likely make their operations more efficient and harmonised, and thus reduce their specific administrative burden. Common training for staff of notified bodies, notifying authorities and Market Surveillance Authorities will have a similar effect as the structural technical support and thus will reduce costs for these stakeholders. Publishing Market Surveillance Authorities penalties will likely create an initial burden with respect to system setup (or integration with existing systems, such as the ICSMS) and then involve low running costs for the actual publishing activities.

Setting up the benchmark and reporting obligation for MSs and especially establishing the requirements for market surveillance checks (in so far as introduced) will likely lead to a considerable cost increase of market surveillance. The new Market Surveillance Regulation allows Market Surveillance Authorities to recover the totality of the costs of their activities with respect to instances of non-compliance, which could compensate the cost increase to some extent.

Costs could also be partly covered through the participation of MSs to the Commission's Single Market Programme³⁸³ or other Union funding.

8.4.1.2. **Direct economic impact for businesses**

Although businesses will have to bear costs related to the digital provision of product data to Market Surveillance Authorities, the actions under this sub-option will also likely lead to decreased non-compliance for those products leading to a more level playing field and increased business opportunities for compliant products.

8.4.1.3. **Indirect economic impact for businesses**

No indirect economic impacts are expected for businesses.

8.4.1.4. **Economic impact for citizens**

The main effect of strengthened market surveillance within sub-option 7b is a reduction of non-compliance. The 2020 EIA Status Report estimates the economic benefit for consumers from avoiding non-compliance related to current product regulations to be in the order of EUR 12 billion in 2030.³⁸⁴ Assuming that non-compliance can only be reduced to a certain extent, thereby achieving only a proportion of the additional benefits (for example, up to 50%) through the measures in sub-option 7b, the economic benefit would still be at around EUR 6 billion. The benefits due to decreased non-compliance would come on top of the benefits deriving from the ability to process additional regulations/reviews connected to the measures under 7a (EUR 9 billion in total compared to baseline).

8.4.2. *Environmental impacts*

The increased capacities and effectiveness of national Market Surveillance Authorities envisioned under sub-option 7b is likely to increase the positive environmental effects of sub-option 7a.

The digital provision of relevant product information to Market Surveillance Authorities would allow a considerable efficiency increase with the associated environmental benefits. Common

³⁸³ 15 million is foreseen annually in the current budgetary period (105 million total) to support market surveillance of Member States generally, see also https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/single-market-programme_en.

³⁸⁴ Ecodesign Impact Accounting Status Report 2020.

training for the different parties involved in implementation and enforcement, as well as structural technical support to improve cooperation between Market Surveillance Authorities and ensure sufficient capacities would likely lead to further efficiency improvements and increase the likelihood of non-compliance detection. Publishing Market Surveillance Authorities penalties decisions would provide a further deterrent for non-compliance. These measures would also likely contribute to the harmonised application of the Ecodesign/SPI product regulations. The EEPLIANT project family has shown that increased harmonisation and cooperation between Market Surveillance Authorities can considerably increase the environmental effectiveness of Ecodesign.³⁸⁵

The measures related to benchmarking of and requirements for market surveillance activities provide tools to incentivise and, where necessary, ensure that Market Surveillance Authorities perform checks on a sufficient scale.

The 2019 EIA Status Report estimates that approximately 10% of environmental benefits of the current Ecodesign legislation are lost due to non-compliance. Assuming that the measures in sub-option 7b will, by increasing the scale and efficiency of checks and thereby reducing non-compliance, reduce lost benefits by 50%, this would translate into the reduction potential summarised in Table 36. It should be noted that these benefits are additional to the ones described in sub-option 7a.

Table 59 Yearly environmental reduction potential of sub-option 7b relative to baseline as percentages of EU totals; own calculations based on EXIOBASE v.3.8.1

| GHG emissions | Human toxicity | Particulate matters | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|---------------|----------------|---------------------|-------------------------------|---------------|----------------|-------------|----------|---------------------------|-----------------------------------|----------------------------|
| 1.6% | 0.7% | 0.8% | 0.9% | 1.9% | 0.5% | 0.7% | 0.2% | 0.1% | 1.6% | 1.7% |

8.4.3. Social impacts

The social impacts of this sub-option are also more difficult to estimate than the environmental and economic impacts. However, increased market surveillance and increased business opportunities for compliant products could lead to additional jobs.

8.5. Sub-option 7c: Reinforce EU level implementation and complement Member States' market surveillance

8.5.1. Economic impacts

Reinforcing EU level implementation and complementing MSs' market surveillance is likely to entail costs at EU level. The height of the costs will partly depend on the extent to which to which these support capacities need to be used to complement MS enforcement efforts.

As with sub-option 7b, sub-option 7c will contribute to tackling non-compliance, which will bring economic benefits.

³⁸⁵ <https://eepliant.eu/>

8.5.1.1. Administrative burden

Administrative burden for economic operators

This sub-option could contribute to lowering the administrative burden for economic operators such as manufacturers and importers through clearer and more adapted requirements, as well as the provision of technical support to answer questions from economic operators related to the implementation of product-specific requirements.

Administrative costs for the European Commission

All measures envisioned under the sub-option would entail a significant administrative burden on the Commission due to the setting up of the necessary capacities for the wide range of products in scope.

The new Market Surveillance Regulation allows Market Surveillance Authorities to recover the totality of the costs of their activities with respect to instances of non-compliance; the same would apply to the European Commission.

The creation of a third-party channel for market surveillance would require initial costs for the setting up of a simple IT reporting system, in addition to running costs. As far as cases would be forwarded to the most relevant Market Surveillance Authorities, only limited additional staff capacity would be needed.

Administrative burden for Member States

The creation of complementary EU-level market surveillance would support Market Surveillance Authorities in their market surveillance, without creating any additional administrative burden.

8.5.1.2. Direct economic impact for businesses

The actions under this sub-option will also likely lead to decreased non-compliance for those products leading to a more level playing field and increased business opportunities for compliant products.

8.5.1.3. Indirect economic impact for businesses

No indirect economic impacts are expected for businesses.

8.5.1.4. Economic impact for citizens

Sub-option 7c would further strengthen market surveillance and thus the reduction of non-compliance. The 2020 EIA Status Report estimates the economic benefit for consumers from avoiding non-compliance related to current product regulations to be in the order of EUR 12 billion in 2020.³⁸⁶ For sub-option 7b, a lost benefits reduction effectiveness of 50% has been assumed. With the additional creation of complementary EU level implementation and enforcement support capacities, it appears feasible that a reduction of 70% can be realised, leading to additional consumer savings of around EUR 2.5 billion compared to 7b. The benefits due to decreased non-compliance would come on top of the benefits deriving from the ability to process additional regulations/reviews connected to the measures under 7a (EUR 11.5 billion in total compared to baseline).

8.5.2. Environmental impacts

The creation of complementary EU level implementation and enforcement support capacities will likely lead to further environmental improvements beyond the other sub-options. It is assumed

³⁸⁶ Ecodesign Impact Accounting Status Report 2019
(<https://www.vhk.nl/downloads/Reports/EIA/EIA%20Status%20Report%202019%20-%20VHK20201028.pdf>)

that the measures in sub-option 7c can further reduce non-compliance and thereby reduce lost benefits by 70%. The results for the individual impact categories are summarised in Table 37, for the energy-related products currently regulated under Ecodesign. It should be noted that these benefits are additional to the ones described in sub-option 7a and 7b. In addition, putting in place EU level support capacities would better allow to tackle new challenges that could emerge with the broadening of products and requirements envisaged.

Overall, sub-option 7c would be associated with reduced GHG emissions of around 22 Mt CO₂e, with a monetary value of around EUR 2.2 billion in 2030. This is around 8% of the reduction in greenhouse gas emissions in 2030 due to energy saving.

Table 60 Yearly environmental reduction potential of sub-option 7c relative to baseline as percentages of EU totals; own calculations based on EXIOBASE v.3.8.1

| GHG emissions | Human toxicity | Particulate matters | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use] | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|---------------|----------------|---------------------|-------------------------------|---------------|----------------|-------------|-----------|---------------------------|-----------------------------------|----------------------------|
| 1.8% | 0.8% | 0.9% | 1.0% | 2.1% | 0.6% | 0.8% | 0.2% | 0.1% | 1.8% | 1.8% |

8.5.3. Social impacts

The social impacts of this sub-option are more difficult to estimate than the environmental and economic impacts. The EU level implementation and enforcement support capacities may induce additional employment demand.

8.6. Impacts on third countries

Manufacturers in third countries are affected in the same way as European manufacturers by the measures in sub-option 7a related to streamlining and third party conformity assessment. Sub-options 7b and 7c are mostly unlikely to have a direct effect on third countries, as the majority of the measures are aimed at MSs and their cooperation with the Commission. The digital provision of product information may place an additional burden on foreign manufacturers or importers in a similar way to data collection in sub-option 7a. The other measures in sub-options 7b and 7c likely have similar effects on manufacturers in third countries as on domestic manufacturers.

8.7. Summary of impacts

Table 61 Administrative burden of PO7

| <i>Administrative burden Option 7</i> | | | | | |
|---------------------------------------|----------------|--|---|--|--|
| | | Businesses | | Administrations | |
| | | One-off | Recurrent | One-off | Recurrent |
| Sub-option 7a | Direct costs | - Infrastructure for additional data provision requirements | - Expenses for third party conformity assessment | - Investment in process optimisation | - Assessment and surveillance on the competence and independence of notified bodies |
| | Indirect costs | n.a. | | | |
| Sub-option 7b | Direct costs | - Infrastructure for additional data provision requirements | - Expenses for product provision | - System setup for provision of product data to MSAs (or integration with existing systems) | -- Expenses for Commission staff for training, technical support etc. (~2 FTE, p.a.) MS expenses for reporting obligation and market surveillance checks |
| | Indirect costs | n.a. | | | |
| Sub-option 7c | Direct costs | n.a. | n.a. | - | -- Staffing at the Commission and budget to coordinate additional testing with MS. Contracts with external laboratories |

| | | |
|--|----------------|------|
| | Indirect costs | n.a. |
|--|----------------|------|

Table 62 Economic impacts of PO7

| <i>Economic impacts</i> | | | | |
|--|---------------------------|--------------------------|--------------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 7a</i> | <i>Option 7b</i> | <i>Option 7c</i> | |
| <i>Direct impacts</i> | | | | |
| Consumer savings through increased benchmarks due to shorter lead times of Ecodesign process | + | + | + | Higher savings on energy costs through higher benchmarks in sub-option 7a |
| | At least 3 billion Euros | At least 3 billion Euros | At least 3 billion Euros | |
| Additional consumer savings through reduction of non-compliance | n.a. | ++ | ++ | Increased effectiveness of successively increased market surveillance in sub-options 7b and 7c |
| | | 6 billion Euros | 8.5 billion Euros | |
| More level playing field and increased business opportunities for compliant products | + | ++ | ++ | Decrease in non-compliant product on the market |
| <i>Indirect impacts</i> | | | | |
| n.a. | | | | |

Table 63 Environmental impacts of PO7

| <i>Environmental impacts</i> | | | | |
|--|---------------------------|--|--|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 7a</i> | <i>Option 7b</i> | <i>Option 7c</i> | |
| <i>Direct impacts</i> | | | | |
| Improvement potential due to efficiency increase | + | + | + | Due to reduced lead time for implementing actions in sub-option 7a |
| Additional improvement potential relative to baseline due to increased market surveillance | n.a. | + | + | Increased market surveillance in sub-options 7b and 7c assumed to successively reduce non-compliance |
| | | 0.1 – 1.9% depending on impact category | 0.1 – 2.1% depending on impact category | |
| <i>Indirect impacts</i> | | | | |
| n.a. | | | | |

Table 64 Social impacts of PO7

| <i>Social impacts</i> | | | | |
|---|---------------------------|------------------|------------------|--|
| <i>Description</i> | <i>Amount/qualitative</i> | | | <i>Comments</i> |
| | <i>Option 7a</i> | <i>Option 7b</i> | <i>Option 7c</i> | |
| <i>Direct impacts</i> | | | | |
| Additional employment demand through measures | + | + | ++ | Some measures may create additional employment demand in the private sector (third party conformity assessment) or public sector (the Commission or Market Surveillance Authorities) |
| <i>Indirect impacts</i> | | | | |
| n.a. | | | | |

Annex 11: Comparison of the options

OPTION 2: EXTENSION OF THE PRODUCT SCOPE OF ECODESIGN LEGISLATION

Overview of Policy Option 2

Sub-Option 2a: Extension to Circular Economy Action Plan priority products (not addressed through separate legislation), and energy-related products, including means of transports, textiles, furniture, high-impact intermediary products and chemicals.

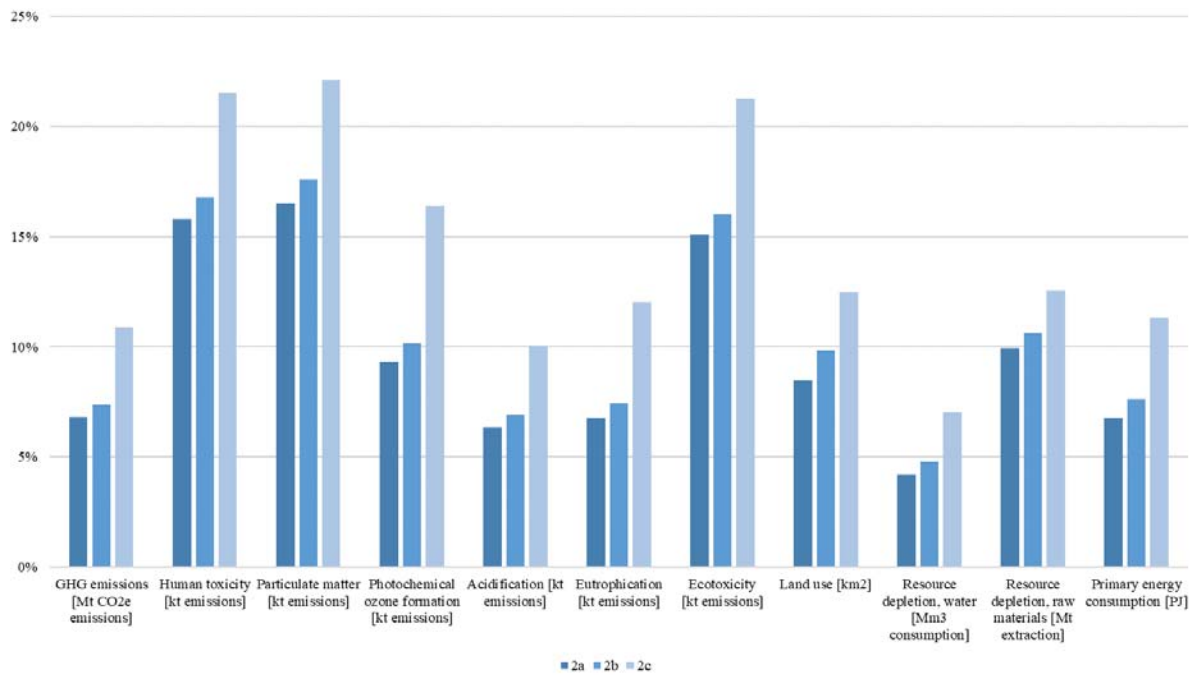
Sub-Option 2b: Extension beyond sub-option 2a to all physical goods.

Sub-Option 2c: Extension beyond sub-option 2b to all services.

The product scope determines the population of products that can be regulated. Their current economic and environmental impacts provide an indication of the scale of what could be regulated. Table 58 provides an overview of this potential coverage using key indicators.

Table 65 Potential coverage of sub-options with respect to economic and environmental indicators; percentages represent shares of EU totals; source: own calculations based on EXIOBASE v.3.8.1 (see Annex 4 for details)

| Policy Option | Economic importance | | | | Environmental impacts | | | | | | | | | | |
|---------------|---------------------|---------------------------|--------------------|--------------------|-----------------------------------|-------------------------------|-----------------------------------|--|------------------------------|-------------------------------|----------------------------|-------------------------|---|---|---------------------------------|
| | Final demand [bn€] | Employment [1000 Persons] | Total exports [M€] | Total imports [M€] | GHG emissions [Mt CO2e emissions] | Human toxicity [kt emissions] | Particulate matter [kt emissions] | Photochemical ozone formation [kt emissions] | Acidification [mt emissions] | Eutrophication [kt emissions] | Ecotoxicity [kt emissions] | Land use [thousand km2] | Resource depletion, water [Mm3 consumption] | Resource depletion, raw materials [Mt extraction] | Primary energy consumption [PJ] |
| BAU | 483 | 7,009 | 417,444 | 252,637 | 2,366 | 37 | 2,201 | 6,951 | 2,083 | 4,902 | 49 | 302 | 35,803 | 7,375 | 32,381 |
| | 4% | 3% | 15% | 11% | 49% | 22% | 25% | 27% | 59% | 16% | 21% | 5% | 4% | 50% | 51% |
| 2a | 3,079 | 47,004 | 1,149,432 | 811,960 | 3,030 | 103 | 5,230 | 11,650 | 2,531 | 9,524 | 134 | 1,381 | 136,196 | 10,014 | 41,698 |
| | 23% | 22% | 42% | 36% | 63% | 60% | 60% | 46% | 71% | 31% | 58% | 23% | 14% | 68% | 66% |
| 2b | 3,441 | 51,754 | 1,350,346 | 1,005,194 | 3,145 | 109 | 5,608 | 12,501 | 2,609 | 10,332 | 142 | 1,736 | 159,255 | 10,436 | 43,830 |
| | 26% | 24% | 49% | 44% | 65% | 64% | 64% | 49% | 74% | 34% | 61% | 29% | 17% | 70% | 69% |
| 2c | 10,257 | 163,800 | 2,370,454 | 1,753,787 | 3,999 | 150 | 7,595 | 20,531 | 3,173 | 17,410 | 203 | 2,546 | 265,032 | 11,871 | 55,681 |
| | 78% | 77% | 86% | 77% | 83% | 88% | 87% | 81% | 90% | 57% | 88% | 42% | 28% | 80% | 88% |



| | GHG emissions | Human toxicity | Particulate matter | Photochemical ozone formation | Acidification | Eutrophication | Ecotoxicity | Land use | Resource depletion, water | Resource depletion, raw materials | Primary energy consumption |
|----|---------------|----------------|--------------------|-------------------------------|---------------|----------------|-------------|----------|---------------------------|-----------------------------------|----------------------------|
| 2a | 6,8% | 15,8% | 16,5% | 9,3% | 6,4% | 6,8% | 15,1% | 8,5% | 4,2% | 10,0% | 6,8% |
| 2b | 7,4% | 16,8% | 17,6% | 10,1% | 6,9% | 7,4% | 16,0% | 9,8% | 4,8% | 10,6% | 7,6% |
| 2c | 10,9% | 21,5% | 22,1% | 16,4% | 10,1% | 12,0% | 21,3% | 12,5% | 7,0% | 12,5% | 11,3% |

Figure 1 Environmental reduction potential of the policy options relative to baseline as percentages of EU totals; own calculations based on EXIOBASE v.3.8.1

Table 66 Qualitative comparison of the impact of the options with regard to the specific objectives - the extent to which the different sub-options allow achieving the (specific) objectives

| Specific objective | Baseline | Option 2a | Option 2b | Option 2c |
|--|----------|-----------|-----------|-----------|
| Improve product sustainability | | | | |
| Better access to sustainability information along value chain. | | | | |
| Incentivise more sustainable products and business models to improve value retention | | | | |
| Improve application of sustainable product legislative framework | | | | |

Table legend:

| Extent to which the objective is achieved | To a little extent | To some extent | To a significant extent | To a very significant extent |
|---|--------------------|----------------|-------------------------|------------------------------|
| Grey scale | | | | |

1.1. Sub-option 2a

Effectiveness in achieving the specific objectives: By expanding the scope of Ecodesign to include the priority products of the CEAP, the environmental improvement potential of this sub-option can double that of the current Ecodesign legislation for some impact categories, including GHG emissions. For other impact categories, the effect is more pronounced as Ecodesign currently predominantly has impacts on energy savings / GHG emissions. Relative to EU totals, the reduction potential ranges from 4 to 16%, depending on the impact category.

Efficiency: The above environmental impacts stand against additional administrative costs at the EU level of approximately EUR 4 million per year. In addition, EUR 10 million for preparatory studies would have to be expended in the coming years.

Coherence: Internally, the scope extension is highly coherent with sub-option 3a regarding existing and additional sustainability requirements on a product level. Coherence also exists with sub-option 3b, which would introduce more far-reaching sustainability requirements and refer to entire product groups. A new sustainable product framework regulation in sub-option 3c would at least partially constitute a substitute for the Ecodesign Directive. Coherence is also given with POs 5 and 6, since they complement the requirements on product design with incentives and circular business models mainly addressing later stages of the product life cycle. The sub-option is also highly coherent with PO 7, which constitutes a strengthened application of the Ecodesign framework and thus supports the scope extension.

Regarding external coherence, the scope extension would be well suited to cover life cycle impacts of products that are not systematically covered by existing legislation. However, due to the inclusion of construction and motor vehicles, it may display some overlap with the Construction Products Regulation and the ELV Directive.

1.2. Sub-option 2b

Effectiveness in achieving the specific objectives: The inclusion of the remaining physical product categories only ensures limited additional environmental benefits. As a result, the environmental effects of sub-option 2b are similar to those of sub-option 2a: the reduction potential ranges from 5 to 18% of EU totals (compared to 4 to 16% under sub-option 2a), depending on the impact category.

Efficiency: The above-mentioned improvement potentials stand against additional EU-level administrative costs of approximately EUR 4.2 million. The amount for preparatory studies would increase to approximately EUR 11 million. As environmental benefits, also costs are thus estimated to only increase marginally compared to sub-option 2a.

Coherence: The internal coherence is not influenced by the further scope extension. Externally, the inclusion of the remaining physical products, which includes plastics, may create overlaps with the Packaging and Packaging Waste Directive and the Single Use Plastics Directive.

1.3. Sub-option 2c

Effectiveness in achieving the specific objectives: The additional inclusion of all services would provide a considerable environmental improvement compared to the baseline and would increase the impacts of sub-option 2b by more than 50% in most impact categories. The reduction potential thus ranges from 7 to 22% of EU totals, depending on the impact category.

Efficiency: Since the additional costs of including all services could not be quantified, estimating the effectiveness of this sub-option is difficult. However, as outlined already, costs are likely to increase disproportionately with the inclusion of services, since services are heterogeneous and therefore the administrative requirements high.

Coherence: The inclusion of services would not reduce the scope extension's internal or external coherence.

Table 67 Summary of benefit assessment

| <i>Benefits</i> | | | | |
|--|------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount</i> | | | <i>Comments</i> |
| | <i>Option 2a</i> | <i>Option 2b</i> | <i>Option 2c</i> | |
| <i>Direct benefits</i> | | | | |
| Reduction of negative environmental impacts through regulation of more products | ++ | ++ | +++ | Larger share of overall environmental impacts covered |
| Scope extension implies additional emphasis on environmental impacts beyond use phase energy consumption | ++ | ++ | +++ | Wider range of environmental impacts covered |
| <i>Indirect benefits</i> | | | | |
| Ecodesign framework gets introduced to new communities | + | + | + | Extension of framework to non-energy-related products |

1.4. Cost estimates – industry

Inputs on the cost increase were provided by nine industry associations representing the battery, home appliances, packaging and textile industries. Those industry associations were asked to provide an indication of the cost increase relative to the baseline (BAU) based on three levels: +) less than 1% cost increase, ++) between 1% and 5% cost increase and +++)) more than 5% cost increase. They were also asked to affirm whether the listed measures do apply to their sector or not (“Not applicable”) or whether the cost increase is inconclusive (when data is missing or the measure is not deemed detailed enough).

Calculating the shares of the cost increase levels (+, ++ and +++) across the nine industry associations reveals that the top three cost drivers are measures for reusability, upgradability and reparability (a total share 65% of +++)), for design for recycling, dismantling and recovery (64% of +++)), and for design for repair and reuse (57% of +++)).

More specifically, costs would be especially driven by third party verification if needed (and external audits if mandatory) and by the length of the minimum availability period (for spare parts). Also, numerous requirements would require the upgrade of IT systems.

Regarding the requirement on energy and performance efficiency during use phase, stakeholders declared that since many efforts have been already made over the last decades, further improvements will need higher investments as well as more development capacity.

Particularly, SMEs in the sectors covered by the Ecodesign Directive will face an increase in compliance costs, in regards to adapting aspects of operation, such as raw material requirements, product design, post first use and end of life. Any compliance costs which are fixed will weigh more heavily on SMEs.

Table 68 Share of respondents estimating the cost of individual measures to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | Measures (Requirements) | + | ++ | +++ |
|--------|--|-----|-----|-----|
| 2a-b-c | for availability of spare parts for repair | 56% | 11% | 33% |
| 2a-b-c | for considering energy efficiency | 39% | 11% | 50% |
| 2a-b-c | for considering recycling as evaluation criteria | 39% | 11% | 50% |
| 2a-b-c | for considering reusability, upgradability and reparability | 25% | 10% | 65% |
| 2a-b-c | for considering use of hazardous substances as evaluation criteria | 60% | 10% | 30% |
| 2a-b-c | for design for recycling, dismantling and recovery | 36% | 0% | 64% |
| 2a-b-c | for design for repair and reuse | 43% | 0% | 57% |
| 2a-b-c | for marking if hazardous substances are used | 67% | 14% | 19% |
| 2a-b-c | for marking plastic components | 71% | 0% | 29% |
| 2a-b-c | for recycling avoiding pollution | 55% | 9% | 36% |
| 2a-b-c | for repair and maintenance | 71% | 10% | 19% |

| | | | | |
|--------|---|-----|-----|-----|
| 2a-b-c | on energy and performance efficiency during use phase | 44% | 11% | 44% |
| 2a-b-c | on energy efficiency during use phase | 64% | 9% | 27% |
| 2a-b-c | on information relevant for disassembly and recycling | 67% | 8% | 25% |

Source: Own calculations based on inputs from Industry associations

1.5. Cost estimates – administration

MS representatives from Sweden, Belgium and the Netherlands were asked during interviews to estimate the additional costs in terms of FTEs generated by the measures of PO2. They underlined the fact that the number of requirements to be reviewed by the Authorities significantly increases conformity costs and outsourcing costs (since MSs may lack the facilities to conduct in-house conformity reviews).

While calculating exact estimates was not possible, some relevant insights shared included: 1) one of the MSs stated that the number of additional FTEs per requirement is equal to 2 FTEs or more, with a small economy of scale (as the marginal costs of conformity review are assumed to slightly decrease conditional on the number of requirements); 2) another MS referred to the current staffing of 20 people working at 80%, and in charge of 40 regulations and 30 product groups, including staffing for internal testing at the agency in charge. In case the scope is expanded to additional product groups, limited economies of scale were expected, namely in relation to the methodological approach applied (which can be horizontal and increase efficiency); and 3) another MS provided an estimate of the current budget, which is between EUR 200 000 and 350 000, compared a approximately EUR 700 000 for Energy Labelling, with the main reason explaining the difference being that the Ecodesign department is part of a larger entity and represents a small activity, as its priority is lower compared to e.g. safety. All MSs highlighted the issue of understaffing, especially in federal countries, that might imply an even higher number of additional FTEs.

Stakeholders' views on the choice of options

Stakeholders were not directly asked to compare the specific sub-options. However, the consultations carried out provide insights into the favoured option.

Several stakeholders asked for the initial focus of the SPI to be on the priority sectors proposed by the CEAP. Other industry representatives would be on board with an extension of the scope to all products. Services were deemed unnecessary to include. They emphasised the need for ensuring that there is no overlap with other regulations and providing robust enforcement and market surveillance.

Member State representatives found it important to add additional products to the Ecodesign Directive scope. However, they believed it would be premature to add services to the scope. Concerning EU citizens, NGOs and environmental groups, the majority want an extension to all products. No significant support for extension to services could be found. Since SMEs indicated a need to have harmonised requirements on products sold in the EU, this would suggest that SMEs would be in favour of extending the scope of the Ecodesign Directive to other products. However, a distinction of which type of products is not elicited from SMEs in the consultation process.

1.6. Assessment of subsidiarity and proportionality

Subsidiarity assessment

The subsidiarity attested to the Ecodesign Directive (2009/125/EC), as set out in whereas 41, holds for all sub-options, since responsibilities between EU and MS authorities do not change in the context of the scope extension.

Proportionality assessment

All sub-options should be considered to comply with the proportionality principle, since the scope extension constitutes a necessary contribution to the achievement of the EU's sustainability goals.

1.7. Preferred sub-option

Based on the above observations, sub-option 2a appears to generate the highest benefit in relation to costs and potential issues regarding coherence with other legislation. In particular, it is capable to double the potential of the current Ecodesign legislation to reduce the environmental impacts of products on the EU market. However, with a view towards future developments in production processes, product distribution, use and disposal, as well as changing evidence on environmental impacts of specific product groups, it appears feasible to define the scope of SPI more broadly to also account for product groups that are not in the CEAP priority list. While the current environmental benefits of sub-option 2b are only marginally bigger than those of sub-option 2a, this may change in the future. At the same time, the additional costs of including the remaining physical products under sub-option 2b are estimated to be on the order of a 10% increase. Against this background, sub-option 2b appears more future proof than sub-option 2a and is therefore the preferred option.

OPTION 3: EXTENSION OF SUSTAINABILITY REQUIREMENTS FOR PRODUCTS

Under PO3, a number of new or reinforced sustainability requirements on products, understood as minimum requirements allowing the placing of these products on the EU market, would be introduced through measures adopted under the revised Ecodesign legislation. Possible dimensions covered by this PO include (i) several circularity aspects (durability, reusability, upgradability, reparability, recyclability, recycled content, remanufacturing and high-quality recycling, restricting certain products or materials in products, countering premature obsolescence, etc.); (ii) improved energy and resource efficiency; (iii) reduced carbon and environmental footprints; and (iv) social aspects along the value chain of products.

Overview of Policy Option 3

Sub-option 3a Enhanced sustainability requirements: Reinforce the circular economy requirements of the Ecodesign Directive whose potential has not been fully exploited yet and add new requirements on the product sustainability of products through existing legislation.

Sub-option 3b Far-reaching sustainability requirements: Develop horizontal requirements for a broad range of products, set minimum requirements on remanufacturing, and introduce the requirements on social aspects along the value chain of products.

Sub-option 3c Ban some products: Allow for the possibility of explicitly prohibiting certain products or materials, based on a clear set of assessment criteria.

Table 69 Qualitative comparison of the impact of the sub-options with regard to the specific objectives - the extent to which the different sub-options allow achieving the (specific) objectives

| Specific objective | Baseline | Option 3a | Option 3b | Option 3c |
|--|----------|-----------|-----------|-----------|
| Improve product sustainability | | | | |
| Improve access to sustainability information along value chains. | | | | |
| Incentivise more sustainable products and business models to improve value retention | | | | |
| Improve application of sustainable product legislative framework | | | | |

Table legend:

| Extent to which the objective is achieved | To a little extent | To some extent | To a significant extent | To a very significant extent |
|---|--------------------|----------------|-------------------------|------------------------------|
| Grey scale | | | | |

Sub-option 3a

Effectiveness in achieving the specific objectives:

As it directly targets the problem 1 and specific objective 1, the effectiveness of sub-option 3a is high. Also, some of the measures under suboption 3a are already being tried out in recent Ecodesign implementing measures (3a1 and 3a2), are provided for in the future Battery Regulation (3a4) and are also at the centre of the review of the ELV Directive. In addition, some of the measures under this sub-option are also considered in the upcoming Ecodesign- and Energy Labelling implementation measures on mobile phones and tablets.

Also, the measure on high-quality recycling is likely to ensure synergies with and make a positive contribution to increasing the supply of high-quality recycled content/secondary material. Demand for the latter will itself be boosted by the minimum requirements on recycled content under this sub-option. Furthermore, extending the coverage to non-energy products, it will be effective covering a wider range of products.

In conclusion, sub-option 3a is likely to be effective, as most of the measures have either already been tried out or show great potential.

Efficiency: Sub-option 3a is expected to be quite efficient, as some of the requirements covered by the measures under this sub-option are already being applied through the Ecodesign Directive (to energy-related products where the implementing measures show high benefit/cost ratio) as well as via relevant policies in some MS. For some sectors, such as repair, refurbishment, etc., the economic impacts will be positive, as the measures will result in a growth of these markets.

Coherence: Sub-option 3a, setting minimum requirements (circularity aspects) on products placed on the market, will be internally coherent with other POs and externally coherent with the existing waste, product and resource policies. Externally, it will support parallel initiatives such as the Green Claims Initiative, the Empowering Consumers for the Green Transition Initiative and Circular Electronics Initiative.

Sub-option 3b

Effectiveness in achieving the specific objectives: Regarding sub-option 3b, and specifically the horizontal requirements covering product groups (3b1), a successful example exists of horizontal standby and network standby provisions under the Ecodesign legislation, targeting electrical and electronic products. As for minimum requirements on remanufacturing (3b2), given that most remanufacturing initiatives are currently pushed by the industry itself, a minimum requirement is expected to bring added value and boost the market possibilities for remanufactured products (with measures under PO6 potentially helping to develop business models to encourage remanufacturing). Regarding the due diligence on the supply chain of products (3b3), as the value chains are spread globally, the effectiveness depends on the clarity of the requirements, their synergies with other related requirements (e.g., under other initiatives) and their ability to be enforced in third countries (e.g., in the textile sector). The Digital Product Passport (PO4) – if chosen – could facilitate fulfilling this due diligence requirement and conveying the related information.

Efficiency: Sub-option 3b further increases the environmental benefits of sub-option 3a thanks to the remanufacturing and due diligence requirements, bringing positive environmental impacts in third countries as well. Also, the cost of development, implementation, compliance and enforcement for requirements covering a group of products is lower than for requirements applying to individual products, which could make this sub-option even more efficient than sub-option 3a.

Coherence: Internally, sub-option 3b ensures the same level of coherence with other POs as sub-option 3a. Externally, it will support parallel initiatives such as the Green Claims Initiative, the

Empowering Consumers for the Green Transition Initiative and the Circular Electronics Initiative.

Sub-option 3c

Effectiveness in achieving the specific objectives: Sub-option 3c would be effective in principle as it will include all eco-design measures defined under 3a and 3b plus targeted bans. The effectiveness of sub-option 3c derives also from the simplicity of the measure of banning some products. However, clear criteria would need to be developed for setting these bans.

Efficiency: Banning the most unsustainable products is a cost-effective way of reducing the impacts of products. However, the cost of replacing banned material/product could have negative economic impact on several stakeholders along the value chain and end users as well.

Coherence: Internally, sub-option 3c ensures the same level of coherence with other POs as sub-option 3a and 3b. Externally, it will support parallel initiatives such as the Green Claims Initiative and the Empowering Consumers for the Green Transition Initiative by simplifying the choice of consumers and removing a potential source of misleading claims.

Table 70 Summary of Benefit assessment

| <i>Benefits</i> | | | | |
|--------------------------------------|------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount</i> | | | <i>Comments</i> |
| | <i>Option 3a</i> | <i>Option 3b</i> | <i>Option 3c</i> | |
| <i>Direct benefits</i> | | | | |
| Health benefits | + | ++ | ++ | Health benefits would be both direct (removal of harmful substances/products) and indirect (through better environment) |
| Environmental or ecological benefits | ++ | ++ | +++ | Sub-option 3b will lead to benefits in the third countries as well because of due diligence. |
| Improved market efficiency | + | ++ | ++ | All sub-options will improve market efficiency. |
| <i>Indirect benefits</i> | | | | |
| Benefits from third-party compliance | ++ | +++ | +++ | Sub-option 3b will also lead to benefits to several actors of the value chain because of due diligence. |
| Achieving internal market | ++ | ++ | ++ | This option will harmonise the requirements and thus create a level playing field for the internal market. |

| | | | | |
|-----------------------------|----|----|----|---|
| Enhanced protection of SMEs | ++ | ++ | ++ | Most of the circularity related businesses are SMEs and this PO will bring additional benefit and protection to them. |
|-----------------------------|----|----|----|---|

Cost estimates – industry

Inputs on the cost increase were provided by nine industry associations representing the battery, home appliances, packaging and textile industries. Those industry associations were asked to provide an indication of the cost increase relative to the baseline (BAU) based on three levels: +) less than 1% cost increase, ++) between 1% and 5% cost increase and +++) more than 5% cost increase. They were also asked to affirm whether the listed measures do apply to their sector or not (“Not applicable”) or whether the cost increase is inconclusive (when data is missing or the measure is not deemed detailed enough).

Calculating the share of the cost increase levels (+, ++ and +++) across the nine industry associations reveals that the top three cost drivers are the measures banning some products or some materials in specific products (53% of ++++), imposing minimum requirements on re-manufacturability and minimum requirements to reduce the carbon and environmental footprints (both 38% of ++++), and imposing minimum requirements on recycled content on the product or components (37% of ++++).

Moreover, costs would be additionally driven by the need to increase testing capacities (investment in test equipment and space), the adaptation of production technology and the (extensive) LCAs to be performed for each type of product (time intensive). The verification costs for incoming raw materials would also significantly increase (according to two industry associations from the home appliances sector), especially if third party verification is needed.

Regarding the requirement on energy and performance efficiency during use phase, stakeholders declared that since many efforts have been already made over the last decades, further improvements will need higher investments as well as more development capacity.

Overall, industry associations estimate that more staff will be needed in the field of testing, quality management, warehouse management and marketing.

At the sub-option level, industry associations’ inputs revealed that sub-option 3c is estimated to be costlier (53% of +++) than sub-option 3a (24% of +++) and sub-option 3b (25% of ++++).

Any fixed costs related to testing equipment/paid studies on energy performance and verification would impact SMEs more than larger businesses.

Table 71 Share of respondents estimating the cost of individual measures to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | Measures | + | ++ | +++ |
|--------|--|------|-----|-----|
| 3a | Minimum requirement on the durability (technical lifetime) or reliability (mean time between failures) of the product or its components | 26% | 50% | 24% |
| | Minimum requirements on recycled content on the product or components (e.g. plastic parts) | 20% | 43% | 37% |
| | Minimum requirements on reparability and upgradability | 74% | 13% | 13% |
| | Minimum requirements to reduce carbon and environmental footprints through minimum requirements set at process and/or life cycle environmental impact(s) level | 41% | 22% | 38% |
| | Requirements enabling high-quality recycling | 57% | 19% | 24% |
| | Restricting the presence of substances hindering circularity | 68% | 28% | 4% |
| | Restricting the presence of substances of concern | 0% | 75% | 25% |
| 3b | Allow for the adoption of requirements covering groups of products (horizontal sustainability requirements) | 86% | 9% | 5% |
| | Compliance with international labour conventions | 100% | 0% | 0% |
| | Minimum requirements on re-manufacturability | 54% | 8% | 38% |
| | Requirements enabling high-quality recycling | 100% | 0% | 0% |
| | Requirements of due diligence on the supply chain of products | 50% | 15% | 35% |
| 3c | Measures banning some products or some materials in specific products like in the Single-Use Plastics Directive | 47% | 0% | 53% |

Source: Own calculations based on inputs from Industry associations

Notes: PO3b also includes PO3a measures while PO3c is calculated based on the PO3c measures only, independently of the measures contained in PO3a and PO3b.

Table 72 Share of respondents estimating the cost of individual sub-options to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | + | ++ | +++ |
|----------------------|-----|-----|-----|
| PO3a | 45% | 31% | 24% |
| PO3b (includes PO3a) | 50% | 25% | 25% |
| PO3c (includes PO3b) | 47% | 0% | 53% |

Note: figures correspond to the total share of +, ++ and +++ by sub-options.

Cost estimates – administration

MS representatives from Sweden, Belgium and the Netherlands were asked during interviews to estimate the additional costs in terms of FTEs generated by the measures of PO3. In this context, they underlined the costs related to verification procedures, especially those related to “due diligence”, since they might require sending inspectors to countries of production of intermediary goods (within and outside the EU). In any case, the highest additional costs (significantly more than two FTEs) would be implied by the compliance with and enforcement of effective bans of products (Sub-option 3c). One to two additional FTEs would also be required for the legislative part at the MS level related to the enforcement of the bans or single use restrictions. *Stakeholders’ views on the choice of options*

Stakeholders were not directly asked to compare the specific sub-options. However, the consultations carried out provide insights into the favoured option.

Support mostly came from NGOs, environmental organisations and consumer organisations. They believe this is the most effective way of reducing the environmental impact of products since consumers are not ready for increased final product prices. For EU citizens, the most impactful measure would be for manufacturers to prove that the design of products is capable of being reused, repaired, shared, upgraded, and recycled. Mainly MS representatives supported the use of the PEF method.

For all proposed measures under the third policy option, industry representatives were less enthusiastic than the other consulted stakeholders. They still showed a preference for establishing a fixed and clear set of far-reaching sustainability requirements. They placed the highest importance (40% of industry respondents) on the provision of binding rules to improve durability, re-usability, upgradability and reparability. Some concerns were mentioned by industry representatives about the potential costs in testing these requirements.

In particular, SMEs indicate a preference for setting requirements to oblige producers to improve product durability, reusability, upgradability and reparability at product level.

Assessment of subsidiarity and proportionality

Subsidiarity assessment

The measures proposed under PO3 comply with the subsidiarity principle, as the following objectives, pursued by said measures, cannot be reached by MSs alone: (i) ensuring a levelplaying field for EU businesses; (ii) guaranteeing a uniform implementation across the single market; and (iii) ensuring the cost efficiency of setting up a single set of measures to avoid different compliance requirements in different -MSs.

Proportionality assessment

Sub-option 3b provides the necessary means to solve the problem/achieve the objective satisfactorily, and ensure effective enforcement. The costs are proportionate to the objectives and the additional costs related to the supply chain due diligence are justified by the positive potential impacts on global supply chains. Finally, thanks to existing policies (Ecodesign and Product Labelling), certain businesses and public authorities are already familiar with the compliance and enforcement procedures, which is expected to ease adaptation.

Preferred sub-option

Sub-option 3b is the preferred option, as it will bring considerable benefits by introducing some changes to existing policies without imposing significant costs.

More in detail, the minimum requirements on re-manufacturability have the potential to drive market possibilities and demand for remanufactured goods. As for due diligence (measure 3b.3), despite the fact that it could entail tangible costs and administrative burdens (for both the industry and public authorities), this measure is expected to have an overall positive influence on suppliers, including those in third countries. Moreover, the due diligence requirement would fit well with sub-option 4b on the Digital Product Passport, which would facilitate its implementation. In any case, its effectiveness depends on the clarity of the requirements to be set as well as on their synergies with other related requirements and their ability to be enforced, including in third countries (e.g., in the textile sector). Nevertheless, elaborating these requirements via SPI measures will allow to set rules with an appropriate level of detail and precision, where necessary on a product-specific basis.

Therefore, sub-option 3b would bring added value, but interactions with other POs need to be carefully considered.

Option 3c seems difficult to justify as it could have disproportionate costs

OPTION 4: SUSTAINABILITY INFORMATION FOR CONSUMERS AND B2B

Sub-option 4a: Enhanced information requirements - Making better use of existing provisions, such as the ecological profile; strengthening the importance of information requirements for circularity (including durability and reparability scoring systems); and making available via digital means on a voluntary basis relevant sustainability-related information.

Sub-option 4b: European Digital Product Passport - Creating a European Digital Product Passport that makes information available to third parties in a digital format (using the same open digital standard).

Sub-option 4c: Generalised European Digital Product Passport - Creating a limited number of “cross-sectoral” requirements in a European Digital Product Passport applicable to any product in the scope of the SPI placed on the market and possibly adding product-specific requirements to the product passport via SPI measures.

Table 73 Qualitative comparison of the impact of the sub-options with regard to the specific objectives - the extent to which the different sub-options allow to achieve the (specific) objectives

| Specific objective | Baseline | Option 4a | Option 4b | Option 4c |
|--|----------|-----------|-----------|-----------|
| Improve product sustainability | | | | |
| Improve access to sustainability information along value chains | | | | |
| Incentivise more sustainable products and business models to improve value retention | | | | |
| Improve application of sustainable product legislative framework | | | | |

Table legend:

| Extent to which the objective is achieved | To a little extent | To some extent | To a significant extent | To a very significant extent |
|---|--------------------|----------------|-------------------------|------------------------------|
| Grey scale | | | | |

The following paragraphs explain the results shown in the table along effectiveness, efficiency and coherence. Summary tables of the benefit, cost and coherence assessment are provided afterwards, as well as stakeholders’ views on the choice of the option.

The baseline scenario includes a number of information requirements, which are, however, limited to a few topics and sectors. As a result, its contribution to the specific objectives is reduced.

Sub-option 4a

Effectiveness in achieving the specific objectives: by creating information requirements on a number of topics, sub-option 4a will first of all provide better access to sustainability information along the supply chain. Indirectly, it is expected to incentivize more sustainable products and business models, as customers (businesses, public procuring agencies and final consumers alike) can select sustainable options more easily and be better informed about the environmental impact of their purchases. In the long term, product sustainability should be improved.

Efficiency: sub-option 4a contains all the information requirements measures of PO4, which are the main drivers of the environmental impact and offer a net advantage compared to the baseline in terms of supporting sustainable purchase. However, it does not provide for a harmonised way of collecting, communicating and making accessible the information. While this approach is flexible and allows companies to adapt their investments, it might result in part of the information not being exploited to its fullest potential and could lead to a lack of interoperability between information provided by different actors along the value chain. Notably, it increases MS surveillance needs, as they are not provided with a specific tool to access all the information made available. In terms of social impacts, sub-option 4a will contribute to the evolution of the labour market, as some sectors will grow and other decline, although this is supposed to be a rather indirect effect. Finally, the introduction of social indicators should support better working conditions.

Coherence: Internally, sub-option 4a essentially supports the implementation of the environmental sustainability requirements placed on products, introduced in sub-option 3a, but also included in 3b and 3c. Also, by introducing classes of performance, it enables their use by MSs to support reputational and economic incentives under sub-option 5b. Externally, it will support ongoing initiatives such as the Green Claims Initiative.

Sub-option 4b

Effectiveness in achieving the specific objectives: sub-option 4b integrates the information requirements of sub-option 4a into a coherent and consistent digital system. The introduction of the European Digital Product Passport will greatly increase the ease of sharing and accessing information, and ensure interoperability and consistency of the information reported. That way, it will reach the specific objective of improving access and exchange of sustainability-related information along value chains.

Efficiency: by introducing the European Digital Product Passport, a very powerful tool for all stakeholders affected along the value chain (companies, procurers, consumers and authorities), sub-option 4b will increase the efficiency of the measures already included in sub-option 4a. This is expected to increase the environmental, economic and social impact of the PO, with the cost-benefit ratio expected to be in favour of the European Digital Product Passport.

Coherence: Externally, the European Digital Product Passport, relying on a consistent set of technical and open standards, will ensure a steady flow of consistent and coherent information also between different policies built around environmental and social life cycle information (e.g., Green Claims Initiative, taxonomy, carbon border adjustment mechanism, Batteries Regulation, Construction Products Regulation, EU Ecolabel, etc.). Internally, the introduction of the European Digital Product Passport will also support the efficiency provided by sub-option 7b, which includes a measure to make relevant product information digitally available to Market Surveillance Authorities. In addition, coordination with the SCIP database could help mitigate the administrative burden on companies under this legislation.

Sub-option 4c

Effectiveness in achieving the specific objectives: sub-option 4c implements the European Digital Product Passport according to a different strategic approach, foreseeing two sets of information (called “attributes”): (i) an horizontal limited number of “cross-sectoral” attributes applicable to all products in the scope of the SPI and already identified as part of the main legal text; and (ii) whenever relevant and appropriate, a set of product-specific attributes to be identified when developing SPI measures. Compared to the baseline and other policy sub-options, this sub-option ensures that access to basic information is guaranteed for all products in the scope of the SPI, independently from the availability of product-specific measures. These attributes would be of general nature (e.g., the name of the product, its colour, details about the manufacturer, the presence of substances of very high concern, etc.). However, the quality and relevance of the information that these horizontal attributes would deliver are cause of concern, as this data would lack the accuracy and specificity of sectoral or product requirements. For this reason, the effectiveness is considered lower than under sub-option 4b.

Efficiency: sub-option 4c will most likely come at an additional cost for businesses, which will have to comply with unspecific requirements. The quality of information provided as a result risks being lower, which would decrease the environmental benefit of PO4. While 4c is introduced to allow for a faster and more ambitious roll-out of the initiative, this decrease in quality shows that there might not be real efficiency gains. The social impacts of higher product costs might not be as well compensated by access to higher quality products.

Coherence: sub-option 4c offers the same elements of coherence as sub-option 4b.

Table 74 Summary of benefit assessment

| <i>Benefits</i> | | | | |
|--|------------------|------------------|------------------|--|
| <i>Description</i> | <i>Amount</i> | | | <i>Comments</i> |
| | <i>Option 4a</i> | <i>Option 4b</i> | <i>Option 4c</i> | |
| <i>Direct benefits</i> | | | | |
| More detailed information on products | ++ | ++ | + | |
| Better access to information | + | ++ | ++ | |
| <i>Indirect benefits</i> | | | | |
| More sustainable products on the market | + | ++ | ++ | |
| Indirect compliance benefit for businesses | + | ++ | ++ | Under sub-options 4b and 4c, links with the SCIP database can provide efficiency in complying with reporting obligations |

Table 75 Summary of coherence assessment

| | <i>Option 4a</i> | <i>Option 4b</i> | <i>Option 4c</i> |
|---------------------------|--------------------------------|---------------------------------|---------------------------------|
| <i>Internal coherence</i> | 3a, 5b, (7b) To some extent | 3a, 5b, 7b To a large extent | 3a, 5b, 7b To a large extent |
| <i>External coherence</i> | To some extent | To a large extent | To a large extent |

Cost estimates – industry

The figures presented below correspond to an average cost increase (by cost category) relative to the baseline (BAU) measured in percent change. As such, these figures can be considered as signals of cost drivers and help identify potential measures which, according to the industry, significantly impact costs.

Industry associations were asked to provide an indication of the cost increase relative to the baseline (BAU) based on three levels: (i) less than 1% cost increase; (ii) between 1% and 5% cost increase; and (iii) more than 5% cost increase. They were also asked to affirm whether the listed measures do apply to their sector or not (“Not applicable”) or whether the cost increase is inconclusive (because of a compliance level in already subjected sectors which is already high). To quantify the industry associations’ inputs, the following figures were retained: 0.5% for (i), 2.5% for (ii) and 5% for (iii) (being unable to assess whether the increase will be significantly above 5% or not).

The three main cost drivers of the PO, according to industry associations, are the costs related to the information requirements for the European Digital Product Passport (>3.11% minimum cost increase), the direct implementation of the Digital Product Passport to whole categories of products (>2.99%) and the information requirements on a set of social indicators (>2.96%).

The cost of new information collection and reporting will weigh more heavily on SMEs as fixed costs are spread over lower sales. For example, in the textile industry, collection of information on durability and reliability has been estimated by an industry association at about €10,000 to €20,000 per company to set-up the collection process, especially in the absence of standards for estimating durability. These costs will be relatively heavier for SMEs.

Table 76 PO4 Cost increase in % by measure and cost category

| Su b- PO | Measures | N° of sectors | Admini strative costs | CAP EX | OP EX | Operati on & mainte nance | Other costs | Mean |
|----------------|--|------------------|-----------------------------|-----------|----------|------------------------------------|----------------|------|
| 4a | Information requirements on the durability (technical lifetime) or reliability (mean time between failures) of the product or its components | 6 | 2.19 | 2.44 | 2.44 | 2.44 | 2.75 | 2.45 |
| | Information requirements in the form of sustainability performance classes | 5 | 2.00 | 2.13 | 3.10 | 1.63 | 1.63 | 2.10 |

| | | | | | | | | |
|----|---|---|------|------|------|------|------|------|
| | Information requirements on a set of social indicators | 6 | 3.08 | 2.70 | 3.08 | 3.20 | 2.75 | 2.96 |
| | Information requirements on recycled content on the product or components (e.g., plastic parts) | 6 | 2.44 | 2.71 | 2.69 | 2.44 | 2.00 | 2.46 |
| | Information requirements on reparability and upgradability, including a reparability scoring | 6 | 2.43 | 2.43 | 2.43 | 2.43 | 2.30 | 2.40 |
| | Information requirements on the environmental impacts along the life cycle of the product, for example in the form of an Ecological Profile | 6 | 3.00 | 2.13 | 3.50 | 2.69 | 2.75 | 2.81 |
| | Requirement to inform on the presence of substances of concern and tracing them | 6 | 2.69 | 2.44 | 2.69 | 2.44 | 2.30 | 2.51 |
| 4b | Information requirements in the form of a Digital Product Passport | 6 | 3.00 | 3.42 | 3.75 | 3.08 | 2.30 | 3.11 |
| | Integrating or closely coordinating the SCIP Database (implementing REACH Art. 33) with SPI requirements | 6 | 1.63 | 1.00 | 1.00 | 1.00 | 1.00 | 1.13 |
| 4c | Direct implementation of a Digital Product Passport to whole categories of products based on horizontal requirements | 6 | 2.33 | 3.75 | 3.10 | 3.08 | 2.70 | 2.99 |

Source: Own calculations based on inputs from industry associations as follows:

Table 77 Average costs for businesses by PO4 sub-option

| PO4 | Admin costs (1) | CAPEX (2) | OPEX (3) | Operation & maintenance (4) | Other costs (5) | Mean (6) |
|------|-----------------|-----------|----------|-----------------------------|-----------------|----------|
| PO4a | 2.48 | 2.46 | 2.83 | 2.45 | 2.35 | 2.51 |
| PO4b | 2.31 | 2.21 | 2.38 | 2.04 | 1.65 | 2.12 |
| PO4c | 2.33 | 3.75 | 3.10 | 3.08 | 2.70 | 2.99 |

Note: the figures correspond to the average cost increase (by cost category) relative to the baseline (BAU). Inputs on the cost increase were provided by industry associations. As for the methodology, the average cost increase by measure is calculated. No distinction is assumed by sub-option, since they refer to different scopes. In red: lowest average minimum cost increase. In blue: highest average minimum cost increase.

Stakeholders' views on the choice of options

Stakeholders were not directly asked to compare the specific sub-options. However, the consultations carried out provide insights into the favoured option.

The introduction of a European Digital Product Passport (therefore going beyond sub-option 4a) **gained overall support**. When asked what information should be included in a European Digital Product Passport, each of the 17 propositions received a positive answer by between 46 to 90% of respondents to the OPC. Support from different stakeholders varied depending on the information proposition: there was strong support for providing the information on the product recyclability and safe use across all stakeholders (at least 75% of all groups of stakeholders agreed or strongly agreed with these measures). On the other hand, requirements to disclose information that could be of use to other operators for repair, remanufacture or recycling, or to market surveillance authorities, and the need to include information on the quantities of materials and substances contained in the product were not so well supported by business associations compared to NGOs, environmental organisations, public authorities, consumer organisations

and academic institutions. EU citizens shared similar views as non-business stakeholders. All in all, respondents to the OPC and participants to the European Digital Product Passport workshop indicated a strong preference for the establishment of the European Digital Product Passport. At the same time, concerns were also expressed about horizontal requirements and a gradual implementation, with product-specific requirements, was preferred to ensure the relevance of information demanded. In light of the above, **sub-option 4b appears to be the preferred option across stakeholders.**

Particularly, SMEs are in favour of a DPP. SMEs expect that the EU DPP would lead to an increase in the amount of low climate impact products and lower pollution levels as well as gradually phase out the use of environmentally harmful materials and increase consumer empowerment. However, there is concern about the additional administrative burden to be put on SMEs and therefore, a distinction between SMEs and large companies should be made if the EU DPP is to be introduced.

Assessment of subsidiarity and proportionality

Subsidiarity assessment

The measures proposed under PO4 comply with the subsidiarity principle, as the following objectives, pursued by said measures, cannot be reached by MSs alone: (i) ensuring a levelplaying field for EU businesses; (ii) guaranteeing a uniform implementation across the single market; and (iii) ensuring the cost efficiency of setting up a single set of measures to avoid different compliance requirements in different -MSs.

Proportionality assessment

The results of the stakeholder consultation point to an overall agreement that the European Digital Product Passport, as defined in sub-option 4b, will deliver overall benefits with regard to the identified problems. Contributions insisted in particular on the need to ensure accessible, reliable and relevant information, which tends to favour sub-option 4b over 4a (accessibility), and 4b over 4c (reliability and relevance). The issue of the cost, and social and environmental impacts of the European Digital Product Passport is considered relevant by respondents (both in the OPC and in position papers), but less importance is attributed to it (as shown in question 2B.2 of the OPC). This is reflected in the study of impacts of PO4 and the sub-option comparison: sub-options 4b and 4c are more ambitious than sub-option 4a, which implies higher costs. As a result, there is a strong indication that sub-option 4b will be the most effective and efficient way to ensure that the costs of the measures will be matched or outweighed by their environmental and social benefits.

Preferred sub-option

Based on the above observations, sub-option 4b is the preferred sub-option, offering the highest potential in reaching the specific objective, and ensuring that cost increases are proportionally matched with clear economic, environmental and social benefits. Also, it is coherent with the other POs in the SPI initiative and with other policies.

OPTION 5: REWARD MORE SUSTAINABLE PRODUCTS THROUGH INCENTIVES

Overview of Policy Option 5

Sub-option 5a: Enhanced incentives measures

- Measure 5a.1 – Member States are encouraged to introduce reputational and economic incentives, supported by the provision of guidelines
- Measure 5a.2 – Mandatory Green Public Procurement requirements in SPI product-specific rules

Sub-option 5b: Linking incentives to performance

This sub-option includes all measures in 5a, plus the following:

- Measure 5b.1 – Member States are obliged to use performance classes to introduce reputational and economic incentives
- Measure 5b.2 – Modulation of EPR fee according to the performance class

Sub-option 5c: Consumption-oriented incentives

This sub-option includes all measures in 5b, plus the following:

- Measure 5c.1 – Bonus for EU citizens to reduce their carbon footprint
- Measure 5c.2 – Introduction of an excise proportional to the life cycle environmental performance of the products placed on the EU market.

Table 78 Qualitative comparison of the impact of the options with regard to the specific objectives – the extent to which the different sub-options allow achieving the (specific) objectives

| Specific objective | Baseline | Option 5a | Option 5b | Option 5c |
|--|----------|-----------|-----------|-----------|
| Improve product sustainability | | | | |
| Improve access to sustainability information along the value chains | | | | |
| Incentivise more sustainable products and business models to improve value retention | | | | |
| Improve application of sustainable product legislative framework | | | | |

Table legend:

| Extent to which the objective is achieved | To a little extent | To some extent | To a significant extent | To a very significant extent |
|---|--------------------|----------------|-------------------------|------------------------------|
| Grey scale | | | | |

The following paragraphs explain the results shown in the table in terms of effectiveness, efficiency and coherence. Summary tables of the benefit, cost and coherence assessment are provided afterwards, as well as stakeholders' views on the choice of option.

The **baseline** scenario includes a number of reputational and economic incentives to encourage the supply and demand of greener products and services, which are different from one Member State to another, and the current market fails at introducing or giving a boost to green products.

Sub-option 5a

Effectiveness in achieving the specific objectives: sub-option 5a will slightly increase the supply and demand for sustainable products. It will provide better access to information for businesses, workers and citizens alike in the European Union on product sustainability. It is also expected to incentivise more sustainable approaches to business and products in general, thus contributing to preserve resources. It will foster research and development activities and non-offshorable job creation. Improvements in production processes and working conditions are also foreseen. Overall, the revenues of companies providing sustainable products and the consumers' awareness towards sustainability are expected to grow. In the long term, product sustainability should improve, although with variations, in Member States.

Efficiency: sub-option 5a is expected to have positive economic impacts on certain businesses, mainly by increasing their revenues. It will also lead to investments in design and production processes. Measure 5a.1 may result in additional administrative burdens for economic operators and Member States, as the implementation of incentives will be on a voluntary basis, while the administrative burden for the European Union will be limited to guidelines and specific provisions for the implementation of GPP. The voluntary aspects could foster discrepancies and market fragmentation. Costs related to the monitoring and enforcement of incentives and GPP costs are expected for Member States, but GPP is also foreseen to lead to financial and resource savings. Introduction of certain types of incentives could impact fiscal revenues.

Coherence: internally, sub-option 5a essentially supports the enhancement of existing incentive measures. Through 5a.1, it notably aims at providing guidelines. It interacts with sub-option 6a, and notably measure 6a.1, which also provides guidelines to support the uptake of circular business models. It also interacts with PO2 and the revision of the Ecodesign directive. Market surveillance activities interact with PO7. Externally, it draws on the Public Procurement Directives, the Ecodesign Directive and existing incentivising tools on reputational incentives (e.g., European Ecolabel, Energy label, European Technology Verification System) and relies on the upcoming revision of the VAT Directive for economic incentives.

Sub-option 5b

Effectiveness in achieving the specific objectives: sub-option 5b is expected to enhance the environmental, economic and social effectiveness of sub-option 5a as Member States would be required, rather than encouraged, to implement incentives. In addition, the introduction of eco-modulation of EPR fees will foster the use of recycled and/or easier-to-recycle material. The use of performance classes will ensure harmonisation at EU level.

Efficiency: while implementing incentives could lead to revenue increase for companies producing sustainable products, it will lead to investments in research and development, design, and productions processes. The eco-modulation of EPR fees could have detrimental effects on companies' production costs. These costs would be passed on, at least partially, to customers although, in the medium to longer term, prices of more sustainable alternatives are expected to decrease and, for some products, move even lower than baseline products. The introduction of certain types of incentives could impact fiscal revenues. In relation to an increased number of incentives implemented, the administrative burden is expected to increase compared to sub-option 5a. However, as the same rules would apply across the EU, it would reduce market fragmentation and limit the magnitude of the additional expenditures required to meet the criteria.

Coherence: internally, sub-option 5b introduces a mandatory use of performance classes for Member States to introduce reputational and economic incentives. These classes are introduced for all sub-options in PO4. As for sub-option 5a, it also interacts with PO2 and PO7. Externally, this sub-option builds on the Energy Label framework and Ecodesign Directive for performance classes, and on the Waste Framework Directive for eco-modulation. It also draws on existing incentivising tools, such as the Ecolabel.

Sub-option 5c

Effectiveness in achieving the specific objectives: sub-option 5c has the potential to level the playing field for less resource-intensive and more labour-intensive practices, which could lead to non-offshorable job creation. The carbon bonus and the excise duty will support change in consumption behaviours towards more sustainable products, but both also present the risk of creating imbalances. The social acceptability of the proposed measures is questionable.

Efficiency: sub-option 5c is expected to increase the revenues of certain businesses as consumers would be explicitly encouraged to turn to sustainable alternatives. Companies would have to invest in research and development, design, and production processes. Although these would not be fully passed on to the consumer, the market share could dwindle. This sub-option would also significantly increase administrative burden for public stakeholders. Among all actors, Member States are expected to bear most of the administrative burden linked to sub-option 5c as they would have to implement incentives, the carbon bonus and the excise duty on products with low environmental performance. The measure could impact fiscal revenues (positively for 5c.2, negatively for 5c.1).

Coherence: internally, sub-option 5c does not interact with another PO, or introduce a different level of coherence. Externally, sub-option 5c supports a carbon footprint score included in the Digital Product Passport, the use of excise taxes defined in the Energy Taxation Directive, and the revised Ecodesign Directive.

Table 79 Summary of benefit assessment

| <i>Benefits</i> | | | | |
|---|------------------|------------------|------------------|--|
| <i>Description</i> | <i>Amount</i> | | | <i>Comments</i> |
| | <i>Option 5a</i> | <i>Option 5b</i> | <i>Option 5c</i> | |
| <i>Direct benefits</i> | | | | |
| Increased revenues for sustainable product and service providers | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Product manufacturers will be impacted. |
| Increased activity related to the design of products and production processes | + | ++ | ++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Product manufacturers and service providers for support activities will be impacted. |
| Changes in purchasing aptitudes of public authorities and savings | ++ | +++ | +++ | The mandatory green product procurement under measure 5a.2 will result in financial and environmental savings. Public authorities will be impacted. |
| Greater accessibility of repair services and growth in the repair services sector | + | ++ | ++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Product manufacturers and service providers for support activities will be impacted. |
| Greater affordability of sustainable products in the medium term | + | ++ | ++ | Citizens and products users will be impacted. |
| Competitive advantage for companies providing sustainable products and services | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Manufacturers and retailers will be impacted. |

| | | | | |
|---|---|----|-----|---|
| Reduction of waste | + | ++ | ++ | <p>Measure 5a.1 is expected to increase the number of collection points for specific products, easing the collecting and recycling processes.</p> <p>Measure 5b.2 introduces eco-modulation in EPR scheme.</p> <p>Product manufacturers, service providers for support activities, and public authorities will be impacted.</p> |
| Increased availability, quality and use of secondary materials | + | ++ | ++ | <p>Measure 5a.1 is expected to increase the number of collection points for specific products, easing the collecting and recycling processes.</p> <p>Measure 5b.2 introduces eco-modulation in the EPR scheme.</p> <p>Product manufacturers, service providers for support activities, and public authorities will be impacted.</p> |
| Buyers choose more durable, reliable, and repairable products | + | ++ | +++ | <p>There is an increased level of stringency for the different sub-options, which encourages (5a.1) the mandatory use of performance classes (5b.1), leading to an increased level of incentives being introduced.</p> <p>GPP is introduced from sub-option 5a.</p> <p>Citizens and product users will be impacted.</p> |
| Increased incentive to improve the safety of workers and consumers | + | ++ | ++ | <p>Reputational incentives have a potential to improve safety.</p> <p>Workers, citizens and products users will be impacted.</p> |
| Job creation | + | ++ | ++ | <p>There is an increased level of stringency for the different sub-options. Incentives have the potential to create jobs in various sectors, including design and recycling. Measure 5b.2 introduces eco-modulation for the EPR scheme.</p> <p>Labour in specific sectors will be impacted.</p> |
| Increased efficiency of Market Surveillance and customs authorities | + | ++ | ++ | <p>Product manufacturers, service providers for support activities, and public authorities will be impacted.</p> |

| <i>Indirect benefits</i> | | | | |
|--|------|------|-----|---|
| Increased product testing, repairing or recycling activities | | | | The increased level of stringency for the different sub-options supports the development and market of more sustainable solution, but also the uptake of circular business models. All actors in the product value chain will be impacted. |
| Development of circular business models | + | ++ | ++ | The increased level of stringency for the different sub-options supports the uptake of circular business models. All actors in the product value chain will be impacted. |
| Competitive advantage through operational performance improvement and better reputation | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. Manufacturers and retailers will be impacted. |
| Potential fiscal revenue | N.A. | N.A. | + | Sub-option 5c introduces the excise duty. |
| Reduced market fragmentation | + | ++ | +++ | The increased level of stringency for the different sub-options supports the development and market of more sustainable solutions. |
| Improvement of the level playing field between companies in Europe | + | ++ | ++ | Sub-option 5b introduces performance classes. |
| Indirect environmental impacts associated with the production of new products decrease as demand decreases | + | +++ | ++ | The introduction of performance criteria should lead to a decrease in the number of products being bought. Evidence however shows a potential for rebound effects. All actors in the product value chain will be impacted. |
| Decreasing environmental impact of material extraction | + | ++ | ++ | Raw material producers will be impacted. |

| | | | | |
|--|---|----|-----|---|
| Reduction in packaging entering the market partly resulting from reduced packaging waste | + | ++ | ++ | Raw material producers, and packaging producers will be impacted. |
| Companies invest in training and reskilling activities to address the new demand | + | ++ | ++ | Product manufacturers will be impacted. |
| Skills development in relation to product life cycle analysis | + | ++ | +++ | Public authorities and citizens will be impacted. |

Costs estimates – industry

Inputs on the cost increase were provided by nine industry associations representing the battery, home appliances, packaging and textile industries. Those industry associations were asked to provide an indication of the cost increase relative to the baseline (BAU) based on three levels: +) less than 1% cost increase, ++) between 1% and 5% cost increase and +++)) more than 5% cost increase. They were also asked to affirm whether the listed measures do apply to their sector or not (“Not applicable”) or whether the cost increase is inconclusive (when data is missing or the measure is not deemed detailed enough).

Calculating the share of cost increase levels (+, ++ and +++) across all industry associations’ inputs reveals that the three top cost drivers relate to energy labels (41% of ++++), the introduction of the excise (due to extensive LCA/PEF testing, 35% of ++++), and the introduction of a taxation on virgin material and unsustainable use of products less suitable for the circular economy (29% of ++++).

Industry associations do not foresee a substantive increase in costs following the implementation/extension of EPR schemes (seeing PRO fees as low).

Increase in staffing will mostly result from the need to document the amount of recycled materials in products.

Taxation on virgin material would imply extensive recycling and production documentation (which increases the administrative burden). Some industry associations (home appliance and battery) also fear that there is not enough high-quality recycled material available at the moment.

At the sub-option level, it turns out that PO5c is estimated by the industry association to be the costliest (22% of ++++), compared to PO5a (17% of +++) and PO5b (14% of ++++)

It is important to recall that both sub-options PO5b and PO5c include the measures of PO5a.

Table 80 Share of respondents estimating the cost of individual measures to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | Measures | + | ++ | +++ |
|-----------------------------|--|-----|-----|-----|
| 5a | Differentiated taxation for the purchase of more sustainable alternatives | 47% | 41% | 12% |
| | European Ecolabel | 38% | 46% | 15% |
| | European energy label (extension of) | 47% | 12% | 41% |
| | Green public procurement (GPP) | 94% | 6% | 0% |
| 5b* (in addition to 5a) | EPR schemes: fees charged by Producer Responsibility Organisation depending on total of waste that needs to be collected, disassembled, and recycled | 87% | 13% | 0% |
| | Eco-voucher for sustainable/environmental-friendly products | 71% | 18% | 12% |
| 5c** (in addition to 5b) | Introduce a taxation on virgin material use and unsustainable use of plastics and products less suitable for the circular economy | 35% | 35% | 29% |
| | The introduction of an excise proportional to the life cycle environmental performance of the products placed on the EU market | 35% | 29% | 35% |

Source: Own calculations based on inputs from Industry associations

Notes: PO5b also includes 5a measures. PO5c also includes 5a measures (but do not include PO5b)

Table 81 Share of respondents estimating the cost of individual sub-options to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | + | ++ | +++ |
|-------------------------|-----|-----|-----|
| PO5a | 58% | 25% | 17% |
| PO5b (includes PO5a) | 65% | 22% | 14% |
| PO5c (includes PO5b) | 50% | 28% | 22% |

Note: figures correspond to total share of +, ++ and +++ by sub-options. Inputs on cost increase have been provided by industry associations. PO5b and PO5c include the measures of PO5a.

Cost estimates – administration

Member State representatives from Sweden, Belgium and the Netherlands were asked during interviews to estimate the additional costs in terms of FTEs (full time equivalent staff) generated by the measures of PO5.

According to their inputs, the most important cost driver is the compliance review process with the EU Ecolabel and Energy Label: it implies the recruitment of more than 5 FTEs.

1 to 2 FTEs are needed for MS to adapt purchasing pattern (as well as to enforce it) to more sustainable products. 2 or more FTEs would require the introduction of an excise (proportional to the life cycle environmental performance of products).

Stakeholders' views on the choice of sub-options

Stakeholders were not directly asked to compare the specific sub-options. However, the consultations carried out do provide insights into the favoured option.

Industry representatives acknowledged that close monitoring enables them to know precisely the strengths and weaknesses of their products. Furthermore, obtaining a label is expected to be beneficial to their revenue as, beyond the reputational gain and competitive advantage, it would qualify their products for other incentives (eco-voucher) and initiatives (GPP). Most importantly, they welcomed the consideration of fiscal measures to incentivise circularity, including the removal of harmful subsidies, lower VAT for sustainable / circular goods / services (including repair services), a tax on virgin / fossil materials, an environmental impact tax, and a tax shift from labour to resources. Some industry stakeholders were in support of setting-up an ambitious eco-modulation of fees in the EPR scheme.

All main stakeholders ranked 'improving access to finance', 'making better use of standardisation' and 'developing and implementing mandatory Green Public Procurement criteria and targets' as the three most important measures to encourage more sustainable production and consumption patterns. Besides these, which are part of sub-option 5b, the modulation of fees is ranked the fourth most important measure. The majority of respondents to the consultation were in favour of establishing a punitive scheme when rules / measures are not followed, though some stakeholders are in favour of positive incentives only.

SMEs were in favour of modulation of EPR fees (69% score at least 4 out of 5, n=59). SMEs tended to be unaffected (29%) or moderately positively impacted (23%) by Green Public Procurement requirements. 19% of SMEs found GPP requirements to be not applicable to their enterprise.

Assessment of subsidiarity and proportionality

Subsidiarity assessment

Depending on their nature, incentives can be implemented at various levels. Economic incentives are implemented at Member States level, while reputational incentives can be implemented at local, national, European or international levels. Action taken by the Member States alone is not sufficient to achieve the objectives. Evidence shows that there are benefits to ensure a uniformed implementation of incentives across the single market and to reduce the number of reputational incentives (see problem section). Guidance will be provided to Member States to implement incentives (5a.1), and mandatory requirements will be introduced to avoid differentiated practices across EU Member States on GPP (5a.2) and EPR fees (5b.2). Under sub-option 5b, linkages with classes of performance will support a level-playing field for EU businesses. The negative consequences resulting from non-harmonised practices lead to significant market entry obstacles, such as divergence in the requirements for economic operators across Member States and associated costs (e.g., national labels).

The aim of setting common binding provisions to support the transition to a circular economy cannot be sufficiently achieved by the Member States but can be better achieved at EU level.

Proportionality assessment

Based on the above observations, sub-option 5b appears to generate the highest benefit in relation to costs and enables a level implementation of reputational and economic incentives, of EPR fees and of GPP across Member States. Economic, environmental and social effects have been taken into consideration. As they relate to creating of market opportunities for sustainable options and

ruling out less sustainable ones, associated costs are commensurate with the underlying objectives of the SPI. Compared to sub-option 5c, sub-option 5b is simpler.

Preferred sub-option

Sub-option 5b is the preferred sub-option.

OPTION 6: MEASURES FOR CIRCULAR ECONOMY AND VALUE RETENTION

Overview of Policy Option 6

Sub-option 6a: Promotion of value retention and value maximisation

- Measure 6a.1. – Providing guidelines on supporting circular business models.
- Measure 6a.2. – EU-wide hub supporting the uptake of circular business models.
-

Sub-option 6b: Enhanced value retention and value maximisation

This option includes all measures included in option 6a plus the following:

- Measure 6b.1. – Introducing a ban on the destruction of unsold consumer products via SPI measures

Table 82 Qualitative comparison of the impact of the options with regard to the specific objectives - the extent to which the different sub-options allow achieving the (specific) objectives

| Specific objective | Baseline | Option 6a | Option 6b |
|--|----------|-----------|-----------|
| Improve product sustainability | | | |
| Improve access to sustainability information along the value chain | | | |
| Incentivise more sustainable products and business models to improve value retention | | | |
| Improve application of sustainable product legislative framework | | | |

Table legend:

| Extent to which the objective is achieved | To a little extent | To some extent | To a significant extent | To a very significant extent |
|---|--------------------|----------------|-------------------------|------------------------------|
| Grey scale | | | | |

Sub-option 6a

Effectiveness in achieving the specific objectives: Sub-option 6a will provide better access to information for businesses, workers and citizens alike in the European Union on circular business models. Indirectly, it is expected to help companies transition towards circular models or develop their circular models further. It is also expected to incentivise more sustainable approaches to business and products in general.

Efficiency: Measures proposed under sub-option 6a are commonly used for different topics and have proved their cost-effectiveness to spread knowledge.

Coherence: Internally, sub-option 6a provides support to all measures on the implementation of sustainable products by promoting the development of Circular Business Models in different sectors of the economy. It helps to provide new economic solutions for businesses that need to start implementing sustainability requirements on their products or making their products more durable. It is particularly related to PO5. Externally, SPI will complement EU funding and

financing programmes focusing on supporting uptake on sustainable, circular and climate-addressing innovations. It will support ongoing initiatives such as the European Circular Stakeholder Platform.

Option 6b

Effectiveness: Evidence from current business practice has shown the negative impact of the destruction of unsold products for the environment. Policy option 6b will increase the level of ambition of PO6 and will force companies to innovate in their supply chain and stock management practices to ensure that unsold products are no longer destroyed. By encouraging alternatives such as donation to social enterprises or remanufacturing, a ban of the destruction of unsold products could provide employment opportunities for low-skilled workers, who can subsequently improve their skills and develop their career through practical training.

Efficiency: the measure implemented will have significant costs for economic operators, Member States as well as the European Commission. Overall, the economic, environmental and social benefits are expected to outweigh the initial costs of the adaptation to the ban.

Coherence: the sub-policy option will take into account measures at EU Member State level to restrict the destruction of unsold goods, as in France and Germany. It will take into account product categories addressed by national measures as well as exemptions. Internally, the proposed transparency obligation, which aligns with the German transparency ordinance, complements the reputational incentive measures (sub-options 5a and 5b) as is dis-incentivizes destruction of unsold products and circumventing the ban on this practice. Market surveillance activities will be conducted in relation to PO7. Externally, by promoting a coherent EU approach to banning the destruction of unsold goods, policy option 6b will contribute to the achievement of the objectives of the EU policies on waste.

Table 83 Summary of benefit assessment

| <i>Benefits</i> | | | |
|---|------------------|------------------|---------------------------------|
| <i>Description</i> | <i>Amount</i> | | <i>Comments</i> |
| | <i>Option 6a</i> | <i>Option 6b</i> | |
| <i>Direct benefits</i> | | | |
| Decrease of GHG emissions | + | ++ | Companies, citizens |
| Increased revenues for companies developing circular products or services | + | ++ | Companies, consumers |
| Circular businesses gain larger market shares | + | ++ | Citizens, consumers |
| Employment | + | ++ | Companies, citizens and workers |

| | | | |
|--------------------------|---|----|-----------|
| opportunities | | | |
| <i>Indirect benefits</i> | | | |
| Improved brand image | + | ++ | Companies |

Costs estimates – industry

Inputs on the cost increase were provided by nine industry associations representing the battery, home appliances, packaging and textile industries. Those industry associations were asked to provide an indication of the cost increase relative to the baseline (BAU) based on three levels: +) less than 1% cost increase, ++) between 1% and 5% cost increase and +++) more than 5% cost increase. They were also asked to affirm whether the listed measures do apply to their sector or not (“Not applicable”) or whether the cost increase is inconclusive (when data is missing or the measure is not deemed detailed enough).

Calculating the share of cost increase levels (+, ++ and +++) across all industry associations’ inputs reveals that the top business cost drivers are the ones related to the obligation for companies to take back unsold products (56% of +++) and costs related to the ban on the destruction of unsold/returned products (43% of ++). This was one of the reasons to discard measure 6c (Set obligation for companies to take back, or donate for use, unsold products and to declare their amount to foster greater transparency, see Annex 9: Policy Options and Measures for more details).

Reverse logistics activities (taking back unsold goods) will require additional staffing. Some “buyback” costs could also be implied (according to one industry association) since retailers might not return products for free.

At the sub-option level, it turns out that 6b is estimated by industry associations to be more costly (43% of ++) than 6a (100% of +).

Table 84 Share of respondents estimating the cost of individual sub-options to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | Measures | + | ++ | +++ |
|--------|---|------|-----|-----|
| 6a | Promotion of value retention and value maximisation | 100% | 0% | 0% |
| 6b | Enhanced value retention and value maximisation | 57% | 43% | 0% |

Source: Own calculations based on inputs from industry associations

Notes: It is important to recall that PO6b includes the measures of PO6a.

Cost estimates – administration

Member State representatives from Sweden, Belgium and the Netherlands were asked during interviews to estimate the additional costs in terms of FTEs (full time equivalent staff) generated by the measures of PO6.

At the MS level more than 2 FTEs are needed to collect and treat data provided by manufacturers and importers on the number of unsold products.

The take-back obligation for companies might impact MS equally since it might already be implemented (for example Belgium). The donation schemes are also being applied widely at the municipal level according to the interviewees.

Stakeholders' views on the choice of sub-options 6a and 6b

Stakeholders were not directly asked to compare the specific sub-options. However, the consultations carried out provide insights into the favoured option.

Businesses active in furniture, home appliances and packaging surveyed in the SPI stakeholder consultation (2) reported that the administrative impact of PO6a would be no different in comparison to the baseline. In terms of economic benefits, PO6a could yield very low or no benefits at all. Costs are expected to be overall moderately lower than benefits. Operation and maintenance costs are expected to be no different compared to the baseline, as are capital expenditures and personal costs. No indirect costs are reported. One organization reported fully supporting the policy option, arguing that the EU can further support circular transformation through technology and innovation programmes where there is a need for industrial innovation. Building competences needed for the future EU generation is also considered necessary.

Turning to PO6b, businesses active in furniture, home appliances and packaging surveyed as part of the SPI stakeholder consultation either argued that there would be no difference with the baseline, or that administrative costs would increase by less than 1%. They reported that the economic benefits would be very low or inexistent. Several requested further clarifications with respect to the implementation of the ban, regarding the definition of the destruction of unsold products the interlinks with product safety and waste legislation. Parallel regulatory amendments were considered necessary to support such a policy option, such as considering used products as products and not waste, and taxation favouring circular business models. Stakeholder views varied with respect to possible impacts on operation and maintenance costs: one business found there were no changes expected in comparison to the baseline, while another found that personal costs (OPEX) would increase by less than 1%, and operation and maintenance costs between 1-5%.

A ban on the destruction of unsold consumer products would have a limited impact on SMEs, given that most SMEs either discount unsold consumer products systematically until sold, or recover materials from the unsold products. Nevertheless, SMEs did consider that products which pose a health or safety risk should be excluded from a destruction ban.

Assessment of subsidiarity and proportionality

Subsidiarity assessment for 6a

- Ensuring a level-playing field for EU businesses and equality of opportunity

Subsidiarity assessment for 6b

- Ensuring a level-playing field for EU businesses
- Ensuring a uniformed implementation across the single market dealing with unsold goods
- Cost efficiency of setting up the same model across the single market, to avoid differentiated practice across EU Member States on the returned of unsold goods.

Sub-option 6a will equally support EU businesses across all Member States.

In order to achieve a significant reduction of waste generated by unsold goods, it is necessary to implement an EU-wide ban. Action taken by the Member States alone is not sufficient to achieve the objectives. While some EU Member States are already taking steps to ban the destruction of unsold products (Germany, France), an EU-wide measure is necessary to avoid dissonance in the internal market. The non-harmonised practices lead to significant varying practices across

Member States, with different levels of stringency of measures to address the destruction of unsold goods.

The aims of setting common binding provisions to support the transition to a circular economy cannot be sufficiently achieved by the Member States but can be better achieved at EU.

Proportionality of the sub-options

Based on the above observations, sub-option 6b appears to generate the highest benefit in relation to costs and enables an EU-level of a ban of unsold products across Member States. Economic, environmental and social effects have been taken into consideration. As they could bring significant economic and environmental effects, associated costs are commensurate with the underlying objectives of the SPI.

Preferred sub-option

Based on the above observations, sub-option 6b appears to generate the highest benefit in relation to costs and enables a level implementation of circular business models in Europe. It offers the highest potential in ensuring positive environmental benefits and also developing new circular business models.

OPTION 7: STRENGTHENED APPLICATION OF THE ECODESIGN FRAMEWORK

Policy Option 7 is built around a strengthened application of the Ecodesign framework. Its three sub-options consist of an improvement of the current framework mainly addressing its efficiency (7a), additional strengthening enforcement, specifically relating to market surveillance (7b), and the creation of complementary EU-level implementation and enforcement support capacities. The sub-options are summarised in the box below.

Sub-option 7a: Improve the current framework to increase efficiency

- Measure 7a1. – Streamline the procedures for the development and adoption of Ecodesign implementing regulations
- Measure 7a.2 – Introduce the possibility to collect data from manufacturers and retailers regarding regulated products sales and usage
- Measure 7a.3 – Add provisions related to third party certification

Sub-option 7b: Strengthen market surveillance of EU Member States

This option includes all the measures provided for under sub-option 7a, plus:

- Measure 7b1 – Make relevant product information digitally available to Market Surveillance Authorities
- Measure 7b2 – Structural technical support to improve cooperation between Market Surveillance Authorities and ensure sufficient capacities
- Measure 7b3 – Organise common trainings for staff of notified bodies, notifying authorities and Market Surveillance Authorities
- Measure 7b4 – Publish penalties decisions issued by Market Surveillance Authorities
- Measure 7b5 – Create a benchmark and a reporting obligation for Member States
- Measure 7b6 – Establish requirements for market surveillance checks

Sub-option 7c: Reinforce EU level implementation and complement Member States' market surveillance

This option includes all the measures provided for under sub-option 7b, plus:

- Measure 7c1 – Complement national market surveillance where needed
- Measure 7c2 – Products monitoring and testing facilities
- Measure 7c3 – Assistance to implementation for suppliers and Market Surveillance Authorities
- Measure 7c4 – Third party channel for market surveillance

Policy Option 7 is built around a strengthened application of the Ecodesign framework. The three sub-options consist of an improvement of the current framework mainly addressing its efficiency (7a), additional strengthening of enforcement, specifically relating to market surveillance (7b), and the creation of complementary EU level implementation and enforcement support capacities. The sub-options are summarised in the box below.

Sub-Option 7a: Improve the current framework to increase efficiency

- Measure 7a1 – Streamline the procedures for the development and adoption of Ecodesign implementing regulations
- Measure 7a.2 – Introduce the possibility to collect data from manufacturers and retailers regarding regulated products sales and usage
- Measure 7a.3 – Add provisions related to third party certification

Sub-Option 7b: Strengthen market surveillance of EU Member States

This option includes all the measures provided for under option 7a, plus:

1. Measure 7b1 – Make relevant product information digitally available to Market Surveillance authorities

| |
|---|
| <ol style="list-style-type: none"> 2. Measure 7b2 – Structural technical support to improve cooperation between MSAs and ensure sufficient capacities 3. Measure 7b3 – Organise common trainings for staff of notified bodies, notifying authorities and MSAs 4. Measure 7b4 – Publish MSA penalties decisions 5. Measure 7b5 – Create a benchmark and a reporting obligation for Member States 6. Measure 7b6 – Establish requirements for market surveillance checks <p>Sub-Option 7c: Create complementary EU level implementation and enforcement support capacities</p> <p>This option includes all the measures provided for under option 7b, plus:</p> <ul style="list-style-type: none"> • Measure 7c1 – Complementary market surveillance • Measure 7c2 – Products monitoring and testing facilities • Measure 7c3 – Assistance to implementation for suppliers and MSAs • Measure 7c4 – Third party channel for market surveillance |
|---|

Table 85 Qualitative comparison of the impact of the options with regard to the specific objectives - the extent to which the different sub-options allow achieving the (specific) objectives

| Specific objective | Baseline | Option 7a | Option 7b | Option 7c |
|--|----------|-----------|-----------|-----------|
| Improve product sustainability | | | | |
| Better access to sustainability information along value chains | | | | |
| Incentivise more sustainable products and business models to improve value retention | | | | |
| Improve application of sustainable product legislative framework | | | | |

Table legend:

| Extent to which the objective is achieved | To a little extent | To some extent | To a significant extent | To a very significant extent |
|---|--------------------|----------------|-------------------------|------------------------------|
| Grey scale | | | | |

Sub-option 7a

Effectiveness in achieving the specific objectives: In comparison with the current Ecodesign framework, the efficiency improvement in sub-option 7a has positive environmental impacts because it would allow to process more product regulations (incl. reviews) with the given resources and in a given timeframe. In addition, the sped-up Ecodesign process would help avoid obsolete standards due to long implementation time frames, while regulation-driven improvements of products would start earlier. Even though the former effect is difficult to quantify, these effects are expected to generate some environmental improvements. However,

with broader coverage, Ecodesign would still suffer from a similar share of non-compliance, which is addressed in sub-options 7b and 7c.

Efficiency: Though it was not possible to reliably quantify the costs of improving the efficiency of the Ecodesign process, including small expenses for process optimisation, additional data provision, and third party conformity assessment, the estimated environmental improvements appear to justify the costs.

Coherence: Internally, this sub-option is coherent with the other Policy Options and their respective sub-options. It supports the scope extension in PO 2 and new sustainability requirements under PO 3. This sub-option also displays external coherence since it only addresses the established Ecodesign framework.

Sub-option 7b

Effectiveness in achieving the specific objectives: Sub-option 7b would additionally strengthen market surveillance and bring about additional environmental improvements mainly through a reduction of non-compliance. It is assumed that of the 10% of potential energy savings that are lost due to non-compliance³⁸⁷, 50% are captured by increased market surveillance, yielding environmental improvements in terms of e.g., 1.6% GHG emissions reduction and 0.8% particulate matter emissions reduction compared to EU totals (see Table 59).

Efficiency: The costs for this policy-option could only be partially estimated. Next to one-off expenses for infrastructure and system setup, businesses face limited expenses for the digital provision of product data, while the Commission will have to provide additional staff trainings and technical support (estimated 2 extra FTEs for organisation, i.e. EUR 300,000 per year). Member States have to comply with reporting obligations and potentially perform additional market surveillance checks. The estimated environmental benefits are considered to justify the additional costs.

Coherence: Same for Sub-option 7a + Sub-option 7b may have synergies with PO 4 regarding the digital provision of relevant product information to Market Surveillance Authorities.

Sub-option 7c

Effectiveness in achieving the specific objectives: The creation of complementary EU-level implementation and enforcement support capacities in sub-option 7c will increase the benefits of the other sub-options relating to efficiency and strengthened market surveillance. It is assumed that non-compliance can be reduced by 70%, leading to environmental improvements in terms of e.g., 1.8% GHG emissions reduction and 0.9% particulate matter emissions reduction compared to EU totals (see Table 60).

Efficiency: The creation of complementary EU level implementation and enforcement support capacities is estimated to create a major cost burden on the Commission in the order of EUR 9 million per year. The assumed environmental improvement potential may not appear to justify the additional costs. However, the complementary EU level capacities may provide a considerable efficiency gain in the future, lowering the administrative burden of Market Surveillance Authorities as well as businesses.

Coherence: Internal and external coherence are the same as for sub-option 7b.

³⁸⁷ 'EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance', Special Report 01, January 2020, European Court of Auditors

Table 86 Summary of benefit assessment

| <i>Benefits</i> | | | | |
|--|------------------|------------------|------------------|---|
| <i>Description</i> | <i>Amount</i> | | | <i>Comments</i> |
| | <i>Option 7a</i> | <i>Option 7b</i> | <i>Option 7c</i> | |
| <i>Direct benefits</i> | | | | |
| Environmental and economic benefits from streamlined processes | + | + | + | More efficient processes can lead to more and better regulations |
| Reduction of non-compliance through strengthened market surveillance | | ++ | +++ | Environmental improvement potential of Ecodesign will be increased through higher compliance rate |
| <i>Indirect benefits</i> | | | | |
| Additional product data can be used in other areas | + | + | + | Sales and technical product data valuable for other environmental policy initiatives |
| MS cooperation. | + | ++ | ++ | Streamlining and harmonisation efforts may increase cooperation between MS, which may benefit other policy fields |
| <i>Benefits</i> | | | | |
| <i>Description</i> | <i>Amount</i> | | | <i>Comments</i> |
| | <i>Option 7a</i> | <i>Option 7b</i> | <i>Option 7c</i> | |
| <i>Direct benefits</i> | | | | |
| Environmental and economic benefits from streamlined process | + | + | + | More efficient process can lead to more and better regulations |
| Reduction of non-compliance through strengthened market surveillance | | ++ | +++ | Environmental improvement potential of Ecodesign will be increased through higher compliance rate |
| <i>Indirect benefits</i> | | | | |
| Additional product data can be used in other areas | + | + | + | Sales and technical product data valuable for other environmental policy initiatives |
| | + | ++ | ++ | Streamlining and harmonisation efforts may increase cooperation between MS, which may benefit other policy fields |

Costs estimates – industry

Inputs on the cost increase were provided by nine industry associations representing the battery, home appliances, packaging and textile industries. Those industry associations were asked to provide an indication of the cost increase relative to the baseline (BAU) based on three levels: +) less than 1% cost increase, ++)) between 1% and 5% cost increase and +++)) more than 5% cost

increase. They were also asked to affirm whether the listed measures do apply to their sector or not (“Not applicable”) or whether the cost increase is inconclusive (when data is missing or the measure is not deemed detailed enough).

Third party conformity assessment would imply contracting costs of tasks (which are sometimes already performed in-house).

Table 87 Share of respondents estimating the cost of individual measures to be less than 1% (+), between 1 and 5% (++) and more than 5% (+++)

| Sub-PO | Measures | + | ++ | +++ |
|--------|---|-----|----|-----|
| 7a | Provisions related to third party certification | 31% | 8% | 62% |

Source: Own calculations based on inputs from industry associations

Cost estimates – administration

Member State representatives from Sweden, Belgium and the Netherlands were asked during interviews to estimate the additional costs in terms of FTEs (full time equivalent staff) generated by the measures of PO7.

The strengthening of the market surveillance and the enforcement of the Ecodesign framework is costly and require more than 2 FTEs by MS (even more for bigger MS).

The setting of minimum surveillance obligations for Member States in relation to specific products or groups of products would also imply the recruitment of more than 2 FTEs (even more for bigger MS). The costs could also be significantly higher for MS that import a large share of their consumption (for example Belgium, Luxemburg). As a result, MS enforcement budget will have to be increased accordingly.

Stakeholders’ views on the choice of options

Stakeholders were not directly asked to compare the specific sub-options. However, the consultations carried out provide insights into the favoured option.

Many stakeholders from industry were in favour of more harmonisation of market surveillance at EU level to avoid duplication of work and resources, and promote effective information sharing. There is also need for more resources in MSs and to increase training of staff and testing capacity. The answers to the open question highlighted that stricter surveillance of imported products and products on the online marketplace is needed.

EU citizens and other non-business organisations agreed that there is insufficient market surveillance and were in favour of improving resources available for monitoring, enforcement and verification. NGOs were in favour of penalties or consumer compensation for non-compliant products.

Stakeholder views on third party conformity assessment were mixed. With the combination of self-declaration and market surveillance, 3rd party conformity assessment was considered not necessary and not required to be mandatory by some stakeholders. However, most stakeholders were in favour of (harmonised) third party conformity assessment and found that self-declaration is not sufficient to address the main offenders.

SMEs were in favour of accompanying measures from the Commission to MSs, concerning market surveillance and enforcement of product compliance. Setting verification targets for products that are most likely to be non-compliant as well as creating a central reporting

point/website to enable feedback from consumers are were considered important by SMEs as well.

Assessment of subsidiarity and proportionality

Subsidiarity assessment

The subsidiarity attested to the Ecodesign Directive (2009/125/EC) as set out in § 41 of the preamble holds for sub-options 7a and 7b, since responsibilities between EU and MS authorities do not fundamentally change. For sub-option 7c, evidence points towards currently partially sub-optimal market surveillance and enforcement, which may justify complementary EU level implementation and enforcement support capacities

The EU level would step in where national efforts would not amount to effective enforcement of SPI requirements, undermining potential of SPI and creating an unlevelled playing field for businesses. Only the EU can effectively and independently perform this complementary and coordinating role. Also, the Commission actions would be to perform checks, cooperating with MS to take action when non-compliances are found.

Proportionality assessment

The proportionality should equally hold for all sub-options since the proposed measures would improve currently sub-optimal processes.

Preferred sub-option

Based on the above observations, sub-option 7b appears to have the best cost-benefit ratio in the long run.

Sub-option 7b generates relatively less benefits than 7c, however it implies less administrative burden for the European Commission and Member States. Overall, 7b is considered the preferred sub-option for the purposes of the impact assessment.

Annex 12: Preferred option

PREFERRED OPTION

The preferred combination of policy options

Based on the assessment and comparison of sub-options and their impacts, the overall preferred option package is a combination of sub-options **2b, 3b, 4b, 5b, and 6b**. For Option 7, **sub-option 7b** is considered for the purposes of the impact assessment.

The assessment of the sub-option retained for **Option 2** – extension of the scope of Ecodesign Directive – is **sub-option 2b**: Extension to all physical products. This will allow to potentially cover any products placed on the EU market, on the basis of clear criteria and a working plan. This will allow prioritization of most important categories and will make the framework flexible and futureproof at the same time. For construction products, the CEAP and SPI goals shall be mainly realised by means of the Construction Products Regulation (CPR). The CPR shall be able to mirror all obligations and requirements able to be set through the SPI, but for construction products – the same is explained in the Impact Assessment (IA) on the CPR revision.

Sub-options 2b would apply criteria for prioritisation that include the following (see annex 16 for more detail). In practice, the product groups identified as first priorities would likely be those under sub-option 2a. However, this sub-option also leaves flexibility to tackle other product groups if so justified, either individually or through horizontal measures:

- Contribution to meeting environmental, climate and energy targets and political priority;
- the environmental impacts of the product along its life cycle
- energy consumption;
- whether there are significant differences in environmental impacts within the product group;
- the potential for improvement in terms of its environmental impacts, energy efficiency and circularity aspects without entailing excessive costs (notion of affordability);
- social impacts along its value chain;
- the potential added value.

For **Option 3** – extension of sustainability requirements for products – **sub-option 3b is preferred**. This means that the product scope extension will be complemented by **new and strengthened provisions on minimum requirements for sustainability and circularity** to be adopted through product-specific SPI measures. In addition, it will include the possibility to adopt **horizontal requirements, applicable to a group of products sharing common characteristics**, for example setting reparability and upgradeability requirements for all electronic devices or minimum information requirements for all products containing substances of concern. Sub-option 3b will also allow the European Commission to spearhead work on **social requirements**, a dimension of sustainability so far not directly tackled through Ecodesign. This new dimension and the use of environmental profiles will build on the reinforcement of the provisions related to third party conformity assessment under Option 7 and build on synergies with the improved consumer and business information provisions under Option 4.

To ensure proportionality, each individual requirement will need to be justified for any product group before being applied. As such, a full toolbox will be available for ensuring sustainability for any product group, but each tool will only be used if suited to the problem at hand for the products being assessed. For example, for some products setting a minimum level of environmental footprint be appropriate, whilst for another it could be an issue of extending lifetime etc.

For **Option 4** – sustainability information for consumers and B2B – **sub-option 4b is preferred**. The extension of the scope of Ecodesign to products that are not energy-using products will make the **provision of information related to the environmental impacts and circularity of products increasingly relevant**, so businesses can demonstrate that they meet relevant sustainability requirements and select sustainable inputs in their production processes, and so consumers can make sustainable choices more easily. This sub-option would also allow for information requirements to be set in the form of classes of environmental performance and will create links with existing databases, like EPREL or the SCIP Database on substances of concern in products. The revised horizontal framework legislation will introduce the **European Digital Product Passport** and the main principles.

The operational details and IT infrastructure design will be developed through secondary legislation (and associated impact assessment), in close collaboration with stakeholders and also building on the results of a number pilot projects currently funded under the Digital Europe and Horizon Europe programmes. These projects will represent a “proof of concept”, applied to at least three product groups (batteries, ICT and a third group to be proposed by the participating consortia). The content of each EU DPP will be decided when developing product-specific SPI measures, with the objective of only requiring the most relevant information, additional to what is already requested through existing legislations. The quantity and typology of information could be minimal at the beginning and increase progressively with time, depending on product groups and the experience gathered when deploying the EU DPP concept. The EU DPP will be used for sustainability aspects of products where relevant and, when relevant and technically feasible, also as a tracking & tracing tool to bring transparency along the value chains and facilitate the role of enforcement authorities. Annex 18 presents some possibilities currently available in terms of “design options” of the EU DPP. This is not meant to prejudge the future decision, but only to provide some examples to allow better understanding of the concept.

For **Option 5** – Reward more sustainable products through incentives – **sub-option 5b is preferred**. This means that Member States, whenever they aim at boosting the demand for sustainable products through incentives, they will be required (as is the case for Energy Labelling) to link their product incentives to classes of performance (developed under Option 4). Public authorities will also be required to align their procurement with specific Green Public Procurement criteria or targets, to be set out in measures adopted under SPI, thereby leveraging the weight of public spending to support more systematically a sustainable and circular economy. They will also be invited to expand their existing Extended Producers Responsibility (EPR) schemes to products covered by the framework and to ensure that fees are modulated as a function of the environmental performance of products, with rules in this respect also to be set out in product-specific measures adopted under SPI.

All sub-options under option 6 are proposed to be retained, to support circular business models and allowing for the introduction of bans on the destruction of unsold consumer products through SPI measures.

For **Option 7** – Strengthened application of the Ecodesign framework – **sub-option 7b** is considered preferred for the purposes of the impact assessment. The extended scope of the Ecodesign framework with even higher sustainability ambitions can only be successful if resources of both the European Commission and Member States are strengthened to a level commensurate with the ambitions. The European Commission (directly or through an executive agency, see section 7.10 *European Commission Administrative setup* below), can play a stronger role to support the design and enforcement of Ecodesign for sustainable product measures.

Impacts of the preferred policy package

The different sub-options chosen all combine well: none of the preferred sub-options needs to be changed as a result of another one. In more detail, building on the extension of scope (2b):

- The addition of sustainability requirements (sub-option 3b) will increase costs for producers, but this should be more than offset by the environmental benefits and savings for citizens. The prioritisation of the different product groups for the development of specific requirements as implementing measures will need to reflect this widening of scope.
- The wider scope of products and sustainability requirements means there is further benefit to the enhanced information requirements and the European Digital Product Passport (sub-option 4b). For example, minimum requirements to reduce environmental footprints (under 3a) combines well with provision of information on this footprint through an Ecological profile (4a) or European Digital Product Passport (4b): the sub-options chosen are mutually reinforcing.
- Similarly, the enhanced incentive measures in 5b will allow for more efficient and effective delivery of the objectives for the product groups in scope, and the wider sustainability requirements.
- Sub-option 6 will assist with delivery of the environmental benefits, and support the effectiveness of the other measures. For instance by *supporting the uptake of circular business models*, the compliance with requirements on reparability, durability and high-quality recycling (sub-option 3b) is expected to be easier.
- Sub-option 7b is similarly consistent with the other sub-options. The extended scope of the Ecodesign framework can deliver benefits commensurate to resources dedicated to its implementation.
- Thanks to this preferred approach, the Ecodesign scope will be extended to cover 65% of total GHG emission from products consumption in the EU, 64% of particulate matter emissions and 70% of resource depletion. Looking at GHG emissions only, assuming an improvement of 15% of environmental impacts over the entire scope from SPI measures, would lead to globally reducing GHG emissions by around 471 Mt CO₂e, the equivalent of the annual emissions of Italy and Belgium.

Feasibility and proportionate implementation

Whilst the changes made through Option 7 and the improved administrative set-up including capacity will ease implementation, it will still be a challenge to respond to the expanded scope of the Ecodesign Directive. It is recognised that the longer list of product groups and environmental impacts to be tackled will imply prioritisation: the revised Ecodesign legislation will have to provide clear, transparent and effective methodological criteria for the selection of the product groups for which the SPI measures will be developed, based on those already foreseen in Article 15 of the current Ecodesign Directive and in Annex 16 to this IA (e.g. environmental, energy and social impacts and related potential for cost-effective reduction of such impacts). The selection will follow a fully transparent process, involving stakeholders, culminating in working plans outlining the priorities to give predictability to economic actors.

Importantly, the existing Ecodesign Directive approach of implementing measures being based on impact assessments carried out in line with the European Commission's Better Regulation guidelines will continue. As such, there will be an analysis of the economic, social and environmental impacts of different options for each set of product requirements. This will allow for proportionality to be maintained in future actions: for example, the analysis will examine the use of different design measures, a European digital product passport, minimum requirements or defining performance scales etc. This means that the assessment and identification of improvement options will be done on a product by product basis or for a group of product sharing common characteristics, underpinned by a sound analysis, and that this will largely determine the ultimate impacts for producers and citizens.

Regulatory burden and simplification

In terms of the overall **regulatory burden**, the financial costs and benefits of the overall package is uncertain and will depend on the SPI measures that follow. The experience from the Ecodesign Directive until now though is relatively positive, with win-win measures being identified. Overall, there are higher costs for business from applying the requirements and these translate into upfront costs for citizens that are more than offset over time. The cumulative costs for business (and citizens) are unlikely to be significant, being spread over a large market, and with the issue of cumulative costs revisited for the different product groups.

The policy proposal includes **simplification measures**, in the context of policy option 7. This will allow for example for streamlining of the procedures for the development and adoption of Ecodesign implementing regulations (changes in sequencing; ensuring information is collected efficiently; etc). Policy option 7 ensures that the structures put in place allow for efficient implementation, market surveillance and enforcement.

This policy proposal makes maximum use of the potential of **digitalisation** to ensure efficient application. In particular, the use of a European digital product passport will allow for efficient delivery of its objectives by ensuring that information failures are corrected by passing the right information downstream in a way that can be understood and accessed. Digital measures are also explored to facilitate efficient implementation with policy option 7, for example, including making relevant product information digitally available to market surveillance authorities (MSAs).

Table 88 European Commission's regulatory fitness and performance programme (REFIT) Cost savings

| <i>REFIT Cost Savings – Preferred Option(s)</i> | | |
|---|---------------|---|
| <i>Description</i> | <i>Amount</i> | <i>Comments</i> |
| Streamlining of the procedures for the development and adoption of Ecodesign implementing regulations | | Savings will depend on the number of number of products covered |
| Collecting data from manufacturers and retailers regarding regulated products sales and usage | | Savings will depend on the number of number of products covered |

International competitiveness

An assessment of the economic impact demonstrates that the proposed initiative would not affect production costs in a significant manner in the long term. As seen in the problem definition, more sustainable products in general imply more production costs compared to less sustainable alternatives. It is expected that the companies selling products in the EU will have to face a cost increase in the short term due to the compliance to the revised Ecodesign legislation. However, the SPI would generate a level playing field in the EU. Furthermore, in the medium/long term the requirements introduced by the SPI measures are expected to become an international benchmark for the product groups concerned, as it is currently happening for products falling under the current Ecodesign Directive^{388, 389}.

³⁸⁸ “[...] Many developing countries could model their regulations on existing ones (those of the European Union, for instance) [...]”, IEA (2020), Appliances and Equipment, IEA, Paris <https://www.iea.org/reports/appliances-and-equipment>

³⁸⁹ “At least 45 countries outside the European Union have adopted minimum energy efficiency requirements for products, some of them in fact implementing ecodesign regulations in the context of association agreements or EU membership negotiations.”, SWD(2015) 139 final

Requirements would not be more trade restrictive than necessary, and apply in a non-discriminatory manner to European and non-European producers, thus avoiding any form of hidden subsidies for EU products vis-à-vis products coming from EU trading partners. Likewise, European producers would not be disadvantaged in their ability to function inside or outside Europe. In line with current EU international cooperation, the EU will provide continuous support to developing and least developed countries for the green transition. In particular, efforts will be made to mitigate possible adverse effects (via technology transfer and capacity building). Moreover, the implementing measures of the revised legislation will be developed in a transparent manner and third countries and trading partner will be fully informed in the process.

The SPI measures would strike a proper balance between predictability and legal certainty and allowing for technological progress. This is important for products in fast changing markets, where there is a need to facilitate adaptability and regulatory responsiveness in line with technological and market developments.

Coherence with other initiatives of the CEAP Sustainable Products Framework

The assessment of the preferred policy options has confirmed the synergies that exist between this initiative, the Empowering Consumers for the Green Transition Initiative and the Green Claims Initiative, which altogether form the Sustainable Products Framework announced in CEAP. See Annex 14 for more details.

OVERVIEW OF COSTS AND BENEFITS

This section brings together the analysis of the chosen sub-options, to set out the overall impacts of the preferred policy option and how these occur over time:

- 1. The setting up of the overall framework, for which the main costs will be associated with setting up the European Digital Product Passport and strengthening of enforcement
- 2. The process for preparing an SPI measure for a product group or horizontal issue
- Most significantly, 3. the impacts that result from those SPI measures for the Member States, EU businesses, EU consumers and the environment as well as impacts outside the EU on businesses, citizens and the environment.

1) Setting up of the overall framework

Policy options 2 (product scope) and 7 (strengthened application of the Ecodesign framework) apply by nature at the level of the framework legislation. Policy Option 2 has no immediate costs. For Policy Option 7, strengthening application and in particular the market surveillance and the enforcement imply additional staff in the Member States, of more than 4 FTEs per MS. In addition, there would need to be 1 FTE for the mandatory obligation for monitoring and evaluation training. Furthermore, an average of two FTEs for customs national authorities in each MS. Overall, assuming that this translates into 210 FTEs³⁹⁰, the administrative costs

³⁹⁰ This is based on 4 people per MS, more for the bigger MSs plus several people in the Commission. This figure assumes a standard cost of EUR 50.000 per annum across the EU27 (including non-wage costs and overheads).

would be around **EUR 10.5 million per annum**. In the Commission, there will be 8 FTEs associated with market surveillance, support to EU testing capacity and customs controls.

These improvements in market surveillance and enforcement will pay off in terms of better implementation of the existing requirements, as about 10% of the potential energy savings delivered by Ecodesign and energy labelling are lost due to non-compliance with the regulations. Assumptions are set out in Annex 10 Section 8.4.1 showing potential economic benefit to consumers of around EUR 8.5 billion per annum (for sub-option 7c): whilst highly uncertain, they suggest that overall benefits should exceed costs significantly from improved enforcement.

Regarding the European Digital Product Passport (EU DPP), the intention is to have a general framework included in the legal proposal, establishing the notion of digital product passport, the option of creating a central registry, governance rules and requesting the empowerment to develop appropriate standards and detailed rules concerning the technical features and the IT infrastructure to be developed. Due to the decentralised design of the system, the administrative costs would be limited, and mainly related to running the EU central registry. The costs for the Commission to set up the European Digital Product Passport are estimated at around EUR 8 million as one-off investment and at least EUR 1 million as annual maintenance cost. However, this is a preliminary estimate based on the information collected and the extrapolation of the costs for other decentralised systems currently under development. The costs for business will depend on the SPI measures and the lessons from first experiences (which will act as a form of piloting). These costs are estimated at around **EUR 140 000** per billion of unique identifiers processed per annum³⁹¹, along with 0.5 FTE staff at the Commission in the initial stages.

Option 6a foresees the creation of an EU-wide hub supporting the uptake of circular business models. The hub could be integrated in an already existing structure/initiative and managed as part of a wider dissemination activity on the SPI (e.g. following the Ecodesign website model). Management costs could be minimised through synergies with other existing platforms, such as the European Circular Economy Stakeholder Platform, or the European Cluster Cooperation Platform, or the Circular Cities and Regions Initiative. Overall, the additional costs for IT development and technical inputs could indicatively remain within **EUR 250,000 per annum** along with 0.5 FTE staff at the Commission.

2) Preparing SPI measures

The **baseline administrative and compliance costs involved in the preparation of implementing measures** was estimated previously to be roughly EUR 7-12 million per year for manufacturers and about EUR 4 million per year for the Commission. The current annual administrative cost for the Member States of around EUR 10 million. A reasonable assumption is a total baseline cost of around EUR 25 million per annum, for manufacturers and competent authorities.

³⁹¹ With the total number of unique identifiers to be processed depending on the number of product groups for which the EU DPP will be requested and the granularity chosen for the unique identifier per product group (at single item level or at product model level).

The costs for implementation of the preferred policy package will perhaps double, so be around another **EUR 25 million per annum**, giving a total cost of around EUR 50 million per annum. This is based on another 30 SPI measures.

Included within this estimate is 13 additional FTEs to deliver Ecodesign Directive commitments for energy-related products. In addition, depending on the speed of delivery, up to 29 additional FTEs could be needed for new SPI products (essentially to deliver options 2 and 3). For example, a scenario consistent with the launch of work on 12 new SPI products in 2024 and then 2 to 4 new products every subsequent year, would require an additional 11 FTE Commission staff initially, rising to up to 29 depending on the level of ambition.

To some extent, the cost of analysis contributes to multiple policies. For example, an additional³⁹² Product Environmental Footprint Category Rules costs between EUR 300,000 and EUR 1,500,000, and allow for identification of environmental hotspots based on lifecycle analysis, whilst supporting companies in managing their production and in making green claims.

3) Impacts resulting from implementing measures

The specific obligations for businesses will arise as a result of the SPI measures. Some will arise immediately resulting from measures affecting design or production whilst others will arise throughout product lives, for example, ensuring support and the availability of spare parts. Impacts of life extension measures on product demand will only arise at the end of the lifetime of the newly marketed products.

A full and quantified assessment will be made when preparing SPI measures, taking into account the products concerned and the precise requirements set in line with the methodology in Annex 18, and also complying with the Commission's Better Regulation Guidelines. **The impact assessments accompanying SPI measures will consider:**

- The problem being tackled
- The different options for action ie the sustainability requirements set out under sub-option 3b
- The economic, social and environmental impacts associated with those sustainability requirements reflecting a range of factors such as implementation, magnitude and distribution of costs (including for SMEs), economic benefits for consumers as well as environmental and social impacts. This will allow for, amongst other considerations:
 - Assessment and consideration of any environmental trade-offs so that at the level of SPI measures conflicting objectives are identified and resolved;
 - Assurance that SPI measures are justified on cost-benefit grounds, including consideration of the net economic impacts and if those economic impacts are negative that they are justified by the environmental benefits.

The impact assessments accompanying the SPI measures will go into more depth and precision, proportionate to the more precise and binding nature of the SPI decisions. Given this, it is challenging to identify the overall costs and benefits, but the existing experience

³⁹² These will already be available for many priority products

with Ecodesign and the analysis undertaken³⁹³ suggest that: **there is likely to be net economic benefits overall** at a global level; and any SPI measure with net economic costs will only go ahead if justified on the basis of its environmental impacts.

SPI measures will be used to implement policy option 3 and 4 (sustainability and information requirements) for specific products or groups of products. Annex 16 sets out in more detail the possible requirements to be made (minimum requirements and information requirements). Where possible, SPI measures will also implement policy options 5 (on incentives) and 6 (on business models and value retention), for example through linking performance classes to incentives or the modulation of EPR fees.

Distribution of impacts along the value chain and by location

The distribution of the impacts is important. Any additional costs for design and production will be incurred where those activities occur. The environmental benefits of improvements in production will also occur where the production takes place. For some pollutants, such as greenhouse gases, ozone depleting substance and mercury, these have a global impact. For others the impact is more local. Many design requirements imply no extra cost if included in the original design brief for new products at the conception stage, but are more likely to imply costs if requiring changes to existing models. Most additional costs arising from more stringent requirements will be passed on to consumers as higher prices. However, whilst measures leading to product life extensions may lead to some cost in terms of product design, they will primarily lead to benefit to consumers in terms of lower overall costs compared to replacing the product more quickly. These benefits will be realised for consumers of the products in the EU. However, their realisation depends on consumer choices.

Table 89 Distribution of impacts

| | Production requirements | Reparability and durability | Recycled content and recyclability |
|---|--------------------------------|---|--|
| Producer | Impact at place of production | Possible cost increase | Unlikely to alter costs |
| Other companies in the value chain | Could be positive | Likely to be positive | Likely to be positive |
| Environmental benefits | Benefit at place of production | Benefit at place of production and possibly place of disposal | Benefit of avoided resource extraction impacts but impacts of recycling activities |
| Consumer | Possible price impact | Potential lower use costs | Unlikely to affect price |

Without pre-judging the future focus of SPI measures, it could be, for example, that the cost implications for producers of washing machines of making it possible to remove all electronic

³⁹³ The assessment (in Annex 10) and comparison (in Annex 11) of policy options gives more detailed indications on the adjustment and compliance costs for industry resulting from SPI implementation.

circuitry in less than one-minute would be close to zero, whereas for recyclers this makes it possible to separately shred the steel shell and the valuable and critical raw materials in the electronic components, reducing impurities in the recycled steel and making recovery of electronics for recycling viable.

Beneficial impacts will accrue not only to consumers, but also to other businesses. For example, it could be assumed that an SPI measure prohibiting the use of a particular dye in fabrics might require the producer to substitute an alternative at low or zero cost, whereas this dye might result in ruined batches for a textiles recycler at great cost. In such cases the benefits will outweigh the costs by many factors, although each accruing to different actors. The preparation of SPI measures would focus on such areas of significant potential benefit. Similarly a company manufacturing car starter motors may incur some minor costs in modifying the design to enable dismantling for replacement of components (eg using non-proprietary fastenings, or sockets rather than glue), whereas these modifications could make the difference between viability or non-viability for a remanufacturer or repairer, and imply that consumers would be obliged to buy a new replacement. The balance of impacts here is likely to be – generally speaking – that costs will be borne relatively more by OEMs, whereas enabled value retention activities will be to the benefit of SMEs.

In certain cases design requirements may induce producers to adopt 'product as a service' models, whereby they retain possession of the product. This might amount only to including additional after-sales services, maintenance contracts and repair offerings through extended product warranties or take back agreements. For example Dell is taking back its computers for remanufacturing and placing back on the market. Or it could extend to retaining ownership of products, and the components and materials embedded in them, as a means of mitigating a range of supply chain risks (access to, and price volatility of, material inputs for example). Several examples exist of such models, which also depend on design choices for durability and recyclability. For example Philips provides lighting as a service favouring more durable and repairable bulbs, and Deso ensures that their leased carpets are made with fibres and dyes that can be made into new carpets in a closed loop system. Ensuring that repair and recuperation of components and spares is facilitated through Ecodesign should encourage more producers to consider offering such services and new business models.

A further element to be taken into consideration in terms of the distribution of producer impacts is the degree to which the production requirements would lead to impacts on production in the EU. Since EU producers are already subject to strict environmental requirements it might be that product requirements would not lead to any increased obligations. If they do lead to additional requirements on EU producers their impact might be relatively small in terms of increased costs and environmental benefits.

Conversely, the value retention activities on products placed on the EU market would be undertaken at the location of the product, and therefore normally within the EU.

Economic Impacts of SPI measures

Overview of economic costs

Minimum requirements for products can include aspects, for example, such as minimum requirement on the durability or reliability of the product or its components, on reparability and upgradability, on recycled content, on carbon and environmental footprints, or to reduce energy consumption/ increase energy efficiency. It could also include restricting certain

substances or compounds hindering circularity, or requirements on removability of components or modularity. The assessment of product improvement potential and emerging technologies should allow for estimates of the costs for manufacturers to redesign

The **costs of such changes are significant**. The additional costs of existing ecodesign and energy labelling requirements for industry, wholesale, retail and installation sectors are though translated into overall increase in business revenues and much higher savings for consumers³⁹⁴.

- The combined measures entail a EUR 60 billion (5%) saving in 2020 on consumer expenditure (EUR 76 billion energy cost saving, EUR 7 billion consumables saved, EUR 23 billion extra acquisition costs). In 2030 this increases to EUR 118 billion (9%). The consumer's monetary saving is 0.4% (in 2020) and 0.9% (in 2030) of the GDP of the European Union (EUR 13 300 billion in 2020).
- Business revenues increase by EUR 21 billion in 2020 and EUR 29 billion in 2030 (5-6%), implying an increase of 324,000 direct jobs in 2020 and 430,000 in 2030.

This is around one billion Euros of economic costs per product group covered. Whilst costs will vary according to the requirements set, and the product group, it is likely that costs will continue to be of this level. A key issue for estimating the costs associated with the Sustainable Product Initiative is whether the costs associated with the Ecodesign Directive are a good basis.

- They could be underestimates as the number of products covered will be larger, as more aspects will be covered, as more environmental impacts are covered;
- They could be overestimates if the measures move away from covering use phase impacts systematically to other more technical and easier to resolve aspects (provision of information, reparability, recyclability, etc.)

Assuming that costs will be between one or two billion Euros, and on the assumption of another thirty SPI measures by 2030, implies **additional costs tentatively in a range of 30 to 60 billion Euros when fully incurred** (assuming those costs are of a similar level to under the baseline). This is based on 30 SPI measures to deliver sub-option 2b. Estimates of future costs are uncertain, and based on many assumptions, and so need to be treated with caution. For example, the time profile for adoption and implementation of additional SPI measures including the time profile for the purchase of the more sustainable products (some costs will only materialise in the years after the adoption of the SPI measures).

The **information provision** component of these costs will largely be about provision of existing information (such as use of certain materials) in a more targeted and accessible manner. There will be additional costs, for example, associated with estimating the sustainability characteristics of a product. As an example, the most ambitious approach would be to require a Product Environmental Footprint (PEF) study for all (16) impact categories at a cost of EUR 3,950 for each product placed on the market by a company³⁹⁵. The PEF study

³⁹⁴ Ecodesign Impact Accounting, Status Report, 2020, European Commission (forthcoming)

³⁹⁵ For cost estimates see the support study for the green Claims Initiative Impact Assessment. This cost assumes that a Product Environmental Footprint Category Rules (PEFCR) is available, which reduces costs per application. The update of a PEF study is assumed to cost EUR 1.185

would provide an environmental score for the product, allowing a minimum threshold for placing on the market to be set.

Product-specific elements of the **EU DPP**, in line with the general framework, for example the list of parameters to be included, their format, measurement or calculation, will be determined in SPI measures (if possible in the same acts introducing product-specific sustainability requirements). The costs of this will be minimised, for example, by ensuring synergies with the SCIP database or by building upon existing product information already passed along supply chains and to the consumer.

Focus on SMEs

SPI will entail some short term negative impacts on existing SMEs. Annex 19 sets out the analysis for SMEs in more detail. Nevertheless, in combination with mitigating measures, we estimate these impacts to remain proportionate for SMEs, with negative impacts offset over time by benefits. SMEs also tend to be more nimble in adapting their products with reduced need to change automated production lines. The negative impacts foreseen are notably linked to implementation of some of the product and information measures outlined under preferred sub-options 3b and 4b respectively, which may entail additional costs and administrative burden that is more difficult for SMEs to bear:

- For 3b, SMEs reported during consultations that they may find it challenging to test the durability of products or gain relevant certification (e.g. if performance classes are required), and may be in a difficult situation if the test fails. They also believe administrative burden will increase if due diligence requirements are set, as this would entail the need to ensure compliance beyond the first or second ‘tier’ in the product value chain, a process which may be more difficult for SMEs.
- For 4b, stakeholders reported during consultations that requiring an Ecoprofile in the form of a Product Environmental Footprint study would be more burdensome for SMEs, as would setting information requirements on social indicators, which would oblige SMEs to gather information from levels of the value chain to which they may not usually have access. Stakeholders also noted that establishment of the European Digital Product Passport is also likely to increase administrative burden for SMEs. This was confirmed by responses to a dedicated SME survey carried out in the context of this IA.

A number of factors are foreseen to offset these effects and assist SMEs:

- Impact assessments in preparation of SPI measures will consider proportionality of the measures for SMEs, as per Better Regulation rules. The ‘Think small first’ principle will be applied. Dedicated SME provisions will be foreseen if needed: justified exemptions or more lenient provisions for SMEs (e.g. longer transitional periods or exhaustion of stock provisions).
- Targeted guidance and support from the Commission: guidelines, training, user manuals, fostering of exchange of best practice will be foreseen. Measures under sub-option 6a will contribute, as will Commission networks like the Circular Economy Stakeholder Platform.
- Increased market opportunities are expected to increase the opportunities to further develop and harness the market for repair, refurbishment, remanufacturing and reselling, where most companies active on the market are SMEs. 70% of SMEs said

that regulations and incentives (e.g. 5b) can boost their innovation in sustainable products.

There is also evidence on the circular-readiness of EU SMEs: 51% of SMEs say they are fully or to a large extent ready to estimate their environmental and social impacts, if required by law. A majority are already introducing more sustainable products to the market. 42% said they expected a DPP to lead to higher economic returns for EU businesses.

Overview of economic benefits

The existing ecodesign measures have had significant economic benefits that outweigh the economic costs. The net savings for consumers were estimated at EUR 60 billion for 2020, rising to EUR 118 billion for 2030³⁹⁶. These savings comprise of energy savings and reduced expenditures for consumables (such as paper and toner for imaging equipment, water and detergents for washing machines and dishwashers, bags for vacuum cleaners, electrodes for welding equipment, etc.) minus extra acquisition costs for regulated and thus more expensive products. The vast majority of these cost savings are for the avoided energy use.

Whilst the economic benefits from Ecodesign so far considerably outweigh the costs, it is difficult to ascertain whether this relationship holds for products where energy savings (i.e. savings in the use phase) are not significant. There are arguments why energy related savings could be larger than for other resources, but consumers are also already aware of the costs of energy. Another significant possible cost saving comes from extending product lifetimes, but consumers are also aware of the costs related to this. There will be three main economic impacts of extended product lifetimes, a reduction in product sales, a reduction in annual costs for consumers and an increase in economic activity linked to repair and maintenance. Although significant energy savings will occur at macro level due to reduced demand for new products driving down embodied energy in products from extraction and processing of materials, this does not directly impact economically on the producer or consumer.

Designing products in a manner which enables their lifetime extension (for example through servicing, repairing and upgrading), optimisation (for example through providing products-as-a-service or peer-to-peer sharing), and which enables more value to be retained at the end of their life (for example through remanufacturing, component harvesting or higher quality recycling), will boost economic activities in providing these services. Such services will in nearly all cases be provided in proximity to where the products are used, that is to say within Europe. The amount of value retention, and the amount of related economic activity depends tends to be higher before a product becomes waste. It has been estimated that landfilling or incinerating 10,000 tons of waste generates 2 jobs, recycling generates 115 jobs, whereas repair activities (which would result in avoidance of waste) generates 404 jobs³⁹⁷.

³⁹⁶ Ecodesign Impact Accounting, Status Report, 2020, European Commission

³⁹⁷ Gaia, Zero Waste and Economic Recovery, 2021

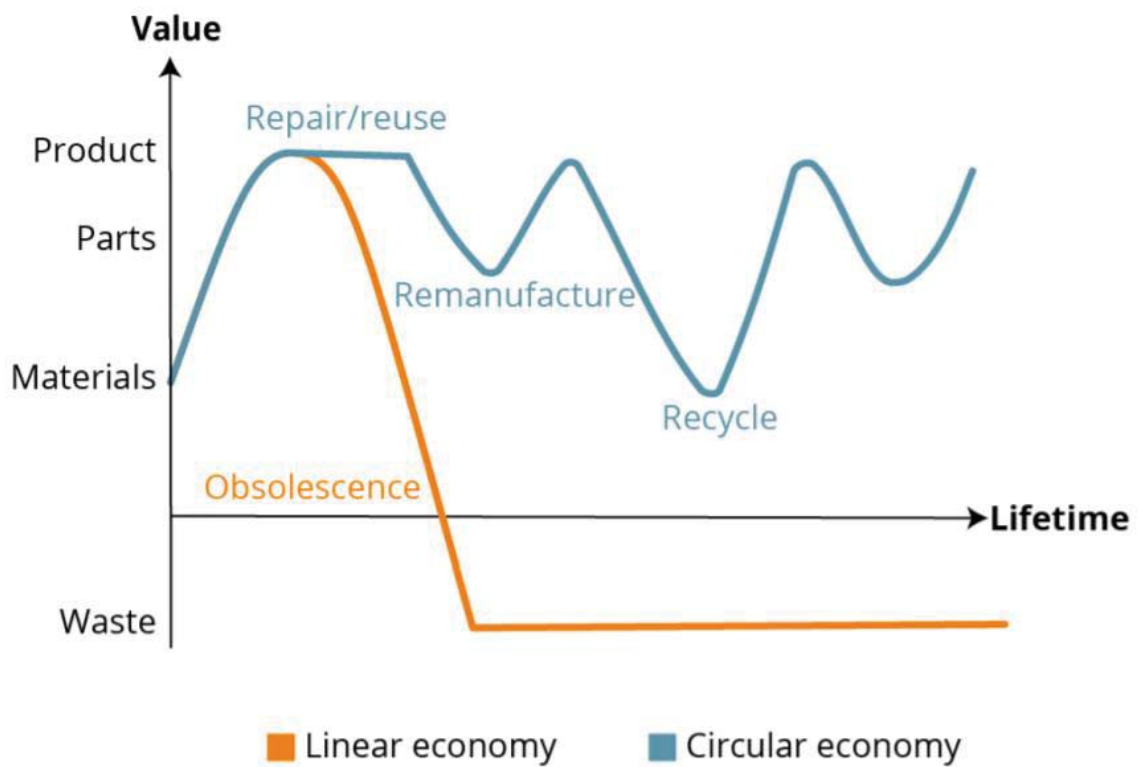


Figure 1 Linear vs circular economy value retention

The degeneration in value retention can be seen as one moves to the outer concentric circles in the graphic below.

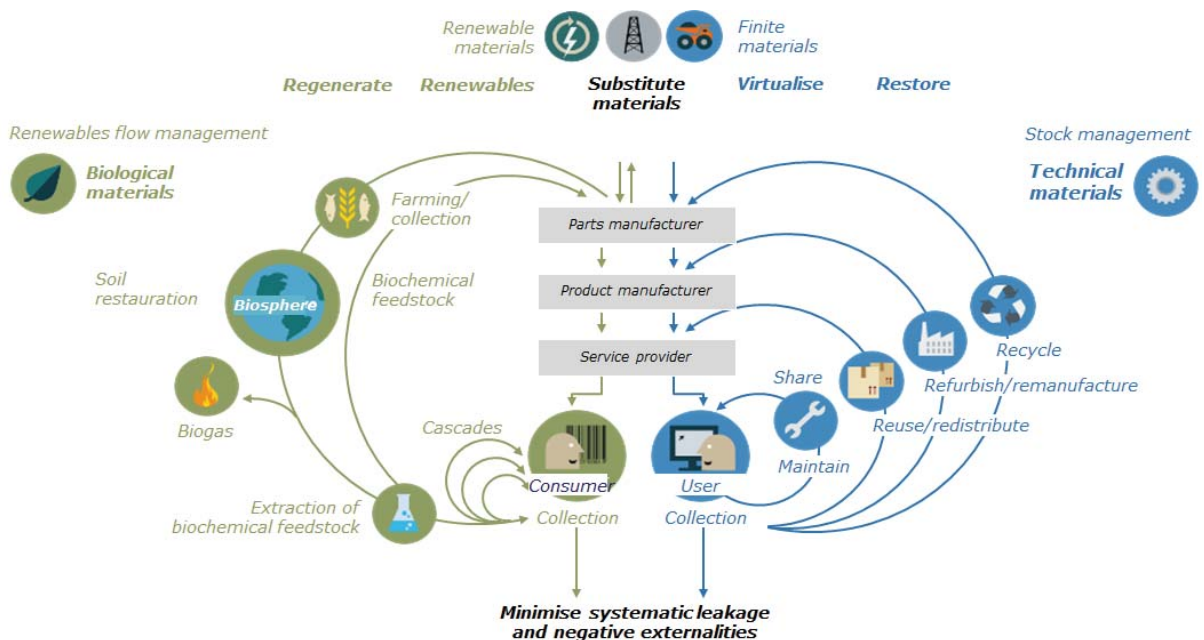


Figure 2 Circular economy systems diagram

Economic and employment effects of circular approaches can be split into three stages of the value chain. First, resource efficiency actions make production less material intensive. This

relative shift of factors of production implies adding more value per tonne of materials usually implying also using more labour. Resource efficiency then implies maintaining that product in operation for longer, and minimising the loss of materials at its end of life.

VDI, the German association of Engineers, has stated that *"businesses are often not very sensitized to the need to design their products in a resource-compatible way. A lack of practical experience often results in challenges in the introduction and management of product related resource efficiency strategies. In most cases, environmental and sustainability aspects are only integrated into the product design via legal requirements, e.g. the Ecodesign Directive 2009/125/EC"*³⁹⁸. VDI has calculated that material input costs for German manufacturing companies are more than double labour input costs, suggesting that material efficiency deserves even more attention than labour productivity. The potential for savings is also significant, and they cite one (perhaps extreme) example where 'A business was able to reduce its raw material costs by 90 % and its energy demand by 50 % compared with conventional competing products by designing products that were suitable for repair, dismantling and production and by complying with the requirements of the "Blue Angel"'

Secondly, once those materials are embodied in products and assets in the economy, circular approaches are directed at prolonging their lifespan (for example through servicing, maintenance, repair and upgrading) and at optimising their use (for example through peer-to-peer sharing, and product-as-a-service business models). These services tend to be labour intensive and involve many skills levels. Finally, at the end-of-life stage circular activities include preparation for re-use, remanufacturing, component harvesting, recycling and other forms of waste management and treatment. SPI will have impacts at each of these stages.

Modelling of the impacts of extending certain EuP lifetimes suggests that this can result in a reduction in lifetime costs to consumers. These cost savings reflect on the one hand lower purchase rates of new products and increased expenditure on their repair and maintenance. These impacts will however only be realised if consumers take the available opportunities offered. Evidence suggests that for many products their lifetime is not limited by technical failure but a desire to replace them before the end of their life. In such cases used-but-functional products are increasingly re-used (for example via services such as Vinted or Backmarket), but many still remain "dormant" or are disposed of.

This illustrates that mechanisms can be identified for measures prolonging the lives of products that could reduce the costs of them to consumers. It also illustrates some of the additional economic activity that would be expected to occur in the EU. However, the degree to which these opportunities will be taken advantage of by consumers, and thus realised, appears to vary between product types. It will also be influenced by other factors outside the scope of this legislation. It is therefore not possible to define categorically the level of the economic benefits that would be realised or whether economic costs would be more than offset by them for the Sustainable Product Initiative. However, environmental benefits will also translate into economic benefits and, these are discussed below.

³⁹⁸ VDI Centrum RessourceEffizienz "Resource Efficiency through Product Development Measures" p.12 VDI ZRE Brief analysis No. 20: Resource efficiency through product development (resource-germany.com)

Environmental benefits

Implementing sub-option 2a could potentially provide benefits in all environmental impact categories: the environmental impacts of the extension to products under sub-option 2a are between 4 and 16% of EU impacts depending on the impact category. In addition, there could also be reductions associated with applying a wider range of sustainability requirements to the existing product scope.

It is uncertain, what percentage of environmental impacts would be reduced by the new sustainability requirements. The existing Ecodesign Directive has had an effectiveness for product groups of around 15%³⁹⁹.

It should be noted that some of the environmental benefits will occur outside the EU. While this can also be of relevance for the EU since they have global effect, this is generally only considered to be the case for a limited range of pollutants, for example greenhouse gases, ozone depleting substances, mercury and biodiversity. As a result international agreements have been implemented for these. Many other environmental impacts are more limited to the local dimension. It is legitimate for SPI to also reduce these, but it is important to understand the relative share since the way their value can be quantified for the EU will differ. One particular challenge will be the ability to verify compliance with any product standards and thus to have certainty that associated environmental benefits are reduced.

The scope of the new initiative will eventually cover 65% of total GHG emission from products consumption in the EU, 64% of particulate matter emissions and 70% of resource depletion. This is an increase in percentage points compared to the baseline of 16% of GHG, 39% of particulate matter and 20% of resource depletion. However, SPI can also deliver further environmental benefits for products already within scope as it has a wider range of measures to consider. Looking at GHG emissions only:

- assuming an improvement of 15% of environmental impacts over the increased (i.e. just the additional) scope from SPI measures, would lead to globally reducing GHG emissions by around 117 Mt CO₂e⁴⁰⁰. Assuming a cost of carbon of EUR 100 per tonne CO₂e⁴⁰¹, the **GHG savings would have a monetary equivalent of around EUR 12 billion per annum.**⁴⁰² These benefits would be realised once SPI measures take force for the products within scope and could for some aspects materialise only when the products affected have been replaced – which could be 20 to 30 years.
- If the new initiative delivered an improvement of 15% of environmental impacts over the whole scope, which is a much more optimistic assumption, it would reduce GHG emissions by around 475 Mt CO₂e. Assuming a shadow price of EUR 100 per tonne

³⁹⁹ Effectiveness varies according to the category being measured. The Ecodesign Impact Accounting 2020 reports an effectiveness of 10% for primary energy in 2020 rising to 18% in 2030, with variation shown by higher effectiveness for NO_x (33% in 2020 rising to 64% in 2030) and lower effectiveness for PM (6% in 2020 rising to 34% in 2030).

⁴⁰⁰ According to Annex 8, the baseline is a reduction of 498 Mt/a CO₂ equivalent (12% of total EU GHG emissions for 2018). This is in relation to a current coverage of 2,366 MtCO₂e. According to the Ecodesign Impact Accounting 2020, the saving is currently 170 MtCO₂e (a 10% reduction) and forecast to grow to 266 MtCO₂e. See Annex 4 for cost of carbon value.

⁴⁰¹ Based on estimates from “Handbook on the external costs of transport”, DG MOVE, 2019

⁴⁰² Ecodesign Impact Accounting, Status Report, 2018, European Commission reports savings of 150 Mt CO₂e in 2020, rising to 257 Mt CO₂e in 2030

CO₂e⁴⁰³, the **GHG savings would have a monetary equivalent of around EUR 47 billion per annum**. Again, these savings would materialise over time.

This second and higher estimate, is more accurately an estimate of what SPI might deliver, rather than a clear estimate of the additional benefits of the changes resulting from this revision.

One factor more clearly relevant also for improving effectiveness for the existing product scope is improvement in the effectiveness of market surveillance and enforcement. It is estimated that some 10% of the achievable benefit from implemented measures is not being realised. Improvements to enforcement under policy option 7 can help to improve this situation and thus deliver a higher proportion of the available benefits. The reduction of non-compliance could reduce GHG emissions by around 22 Mt CO₂e in 2030.

Environmental Externalities

Annex 11 sets out the significant possible environmental impacts for a range of environmental impact categories. In the current Ecodesign the main market failure was that enterprises did not introduce cost-effective energy savings - so, there was an economic gain that compensated for the extra costs. This will be the case under SPI to a lesser extent, which will instead have a stronger focus on externalities that are not integrated in prices. The benefits for society from improving the internalisation of environmental externalities will be significant but less directly reflected in economic estimates.

SPI would help respond to criticism – as recently confirmed by the European Court of Auditors⁴⁰⁴ - that a more rigorous application of the polluter pays principle is possible, and can also produce positive macroeconomic benefits for the EU economy. This is the case for environmental impacts covered under SPI, such as air pollution and GHGs, water pollution, waste treatment, water scarcity and biodiversity loss.

A recent study of the degree of internalisation, shows clearly that EU polluters are not being made to pay in full – across all pollutants, in all Member States and across all sectors of the economy. The evidence is strongest in the case of air pollution and GHGs and water pollution, for which good data on both costs and emissions is available, but more localised evidence about other forms of environmental damage tells the same story.

The external costs of air pollution and GHGs amount to approximately €720 billion per year across the EU – around 5% of EU GDP – of which just 44% is internalised in taxes or economic instruments economy-wide. There is, however, wide variation both between economic sectors and among Member States. In other areas of environmental damage, internalisation rates across the EU are even lower. The EU-wide internalisation rate of water pollution costs reaches 16% for point sources, linked to households and industry, but is negligible for non-point sources.

⁴⁰³ Based on estimates from “Handbook on the external costs of transport”, DG MOVE, 2019

⁴⁰⁴ European Court of Auditors (2021) Special Report 12/2021: The Polluter Pays Principle: Inconsistent application across EU environmental policies and actions, <https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=58811>

Estimates for water scarcity and biodiversity loss are harder to derive, because of their complexity and highly site-specific nature. Nonetheless, case studies assessed in this study suggest that in these areas the internalisation rates are also extremely low.

Overall, it is reasonable to assume that total environmental costs exceed €1 trillion per year⁴⁰⁵. The SPI will contribute by internalising some of these external costs, and also by reducing environmental impacts and hence their level.

Analysis of the potential for resource efficiency

Overall on resource efficiency

Resource efficiency can lead to financial savings, reduced supply risks- and footprint, innovation and market opportunities – saving at least EUR 600 billion for EU businesses⁴⁰⁶, while combined with circular measures, benefits are much higher. Resource productivity improvements of 1-2% per annum can lead to positive GDP impacts up to 1% and to employment impacts up to 0.5% by 2030⁴⁰⁷, while higher resource productivity increases are also possible, enabled by faster technology change and higher levels of circularity, leading to increased socio-economic benefits.

Benefits include resource- and financial savings; reduced supply risks and waste; innovation, competitiveness (first-mover advantage, corporate image etc.) gains and GDP growth; sustainable products for customers; local jobs (social integration), many in SMEs. Circular economy attracted EUR 17.5 billion private investments in 2016 (0.12% of GDP), provided 4 million jobs (1.7% of total employment) and generated EUR 147 billion value added (reaching around 1% of GDP). Circularity creates growth and jobs in secondary raw materials (SRM) markets (now 12% of raw materials demand).

The ‘Towards Sustainability Scenario’ of the International Resource Panel (IRP)⁴⁰⁸ shows that resource efficiency and sustainable consumption and production can slow resource use dynamics significantly, so that incomes and other well-being indicators improve, while key environmental pressures fall. Global resource productivity can increase by 27% to 2060, and decoupling can boost economic growth by 8% over historical trends, outweighing decarbonisation costs and delivering a more fair income distribution and access to resources. Resource efficiency can reduce GHG emissions by 19% and help protect and restore native habitats. The International Resource Panel work on remanufacturing illustrates the practical potential for different ways of manufacturing to generate and retain value in the economy.⁴⁰⁹

Private investment in the circular economy sectors of the EU-27 attracted EUR 15 billion private investment in 2017, provided EUR 125.8 billion added value and 3.5 million jobs, yet most of the circular economy’s full potential – concentrating at circular design, and products, waste prevention, durability and reuse, circular business models, efficiencies and synergies – is still to be unlocked.

⁴⁰⁵ Green taxation and other economic instruments Internalising environmental costs to make the polluter pay, IEEP et al, 2021 (source for estimates of externality costs and degree of internalisation)

⁴⁰⁶ The opportunities to business of improving resource efficiency. AMEC, 2013.

⁴⁰⁷ Modelling economic and environmental impacts of raw material consumption. Cambridge Econometrics, 2014. and Links between production, the environment and environmental policy. Cambridge Econometrics, 2019.

⁴⁰⁸ Global Resource Outlook 2019, IRP

⁴⁰⁹ [Redefining Value \(IRP 2018\) - Full Report.pdf \(cec.eu.int\)](#)

What level of improvement is possible for SPI products?

An assessment of the environmental benefits requires an assessment of the percentage of environmental impacts avoided due to SPI. As discussed above, the reduction of CO₂e thanks to the existing Ecodesign experience is 10% rising to 18%⁴¹⁰, with improvements for other environmental factors as well. A hypothesis is that SPI could reduce environmental impacts by 15% with a split between life extension and improvements in the product process:

- For a 7.5% benefit from **life extension**, an assumption is that half of consumers take advantage of the possibility and that the life extension is 20%. A 20% life extension reduces demand by 16% and if 90% of the lifecycle impacts are in the phases other than use, then this equals a 7.5% reduction in impacts if half the consumers use that possibility.
- The 7.5% benefit from **improvements in the production process** is plausible given the experience with in regulating production processes, supported by banning certain processes and impacts of enhanced information on environmental impacts. Nevertheless, account needs to be taken of the degree to which these impacts are already regulated for EU producers.

Life extension and improvements in the production process are discussed below in more detail.

Life extension

The environmental impact of prolonging the lifetime of a product depends on the ratio of impacts along its value chain. For example, the life-cycle impact of a smartphone is concentrated 80% in the pre-use phase (extraction, processing, production and distribution), whereas for certain other products (eg: TV or desk-top computer) the use-phase impacts are relatively higher⁴¹¹ (and replacement with more efficient new products may even in limited cases provide environmental benefits). The environmental benefits of prolonging the life (and therefore avoiding the replacement with new) of the smartphone are therefore relatively higher. However, the role of consumers is key and replacement of products more associated with status (e.g. smartphones compared to washing machine) is more likely to be before their end of life and may be harder to influence.

- It is estimated⁴¹² that a 1-year lifetime extension of all washing machines in the EU would save 0.25 Mt CO₂ per year by 2030; for notebooks, the figure is 1.6 Mt CO₂; for vacuum cleaners, 0.1 MtCO₂; for smartphones, 2.1 MtCO₂. Extending the lifetime of these four products in the EU by one year would therefore save around 4 MtCO₂ annually by 2030, the equivalent of taking over 2 million cars off the roads for a year. Extending the life of smartphones alone would be equivalent to removing 1 million cars.
- A lifetime extension of 3 years would save around 0.66 MtCO₂ annually by 2030 for washing machines; 3.7 MtCO₂ for notebooks; 0.3 MtCO₂ for vacuum cleaners; and 4.3 Mt CO₂ for smartphones.

⁴¹⁰ Ecodesign Impact Accounting, Status Report, 2018, European Commission

⁴¹¹ Jens Malmödin and Dag Lundén (2018). The Energy and Carbon Footprint of the Global ICT and E&M Sectors 2010–2015

⁴¹² Coolproducts DON't Cost the Earth Report (2019) European Environment Bureau

- A 5-year extension would correspond to about 1 MtCO₂ annually by 2030 from washing machines; 5 MtCO₂ for notebooks; 0.5 MtCO₂ for vacuum cleaners; and 5.5 Mt CO₂ for smartphones.

In general the global impact of extraction and processing activities are estimated at 50% of GHG emissions and 90% of biodiversity loss (however this includes food production and not only products)⁴¹³. To date the focus of the Ecodesign Directive has been on reducing use-phase emissions, however embodied emissions and other environmental impacts are relatively significant.

One study calculated that consumer costs could decrease by around 15% from increased reparability (which includes the economic value of the repairs), whilst sales would decrease around 30% if all consumers took full advantage of the extended lifetime opportunity⁴¹⁴. In practice, not all the potential benefit that would be realised. There are also studies showing positive economic returns to the ecodesign processes envisaged under the SPI⁴¹⁵.

According to another study, goods that have longer lifespans generally have a lower total lifetime costs compared to the standard option, mostly due to postponing the purchase of the replacement appliance⁴¹⁶.

Not all goods are only replaced at the end of their lives (as for example, fashion and other factors also play a role in the decision to replace a good), but there is evidence that a significant share of consumers will keep goods for a long time. For example, the results of the Eurobarometer 503 show that the main reasons that led respondents to replace their digital devices were that the device broke (38%), the performance of the device had significantly deteriorated (30%) and certain applications or software stopped working on the device (18%).⁴¹⁷

Increasing the market share of products with a longer lifespan is generally^{418,419} expected to contribute to a reduction of resource depletion, waste, emissions and other environmental costs associated with the production, distribution and disposal life-cycle stages^{420,421,422,423,424}

⁴¹³ UN International Resource Panel, Global Resources Outlook (2019) [Global Resources Outlook | Resource Panel](#)

⁴¹⁴ Repairability criteria for energy related products'; KUL, VITO etc; June 2018

⁴¹⁵ ANALYSE DES BÉNÉFICES ÉCONOMIQUES ET FINANCIERS DE L'ÉCO CONCEPTION POUR LES ENTREPRISES <https://bibliothèque.ademe.fr/produire-autrement/1264-analyse-des-benefices-economiques-et-financiers-de-l-eco-conception-pour-les-entreprises.html>

⁴¹⁶ EC Study on "The durability of products"

⁴¹⁷ European Commission, Attitudes towards the impact of digitalisation on daily lives, 2019.

⁴¹⁸ Some studies point out that some large household appliances might be an exception if newer models are significantly more energy efficient than the models own by consumers. In this case, it is possible that the environmental costs associated with materials, production, distribution and disposal of buying an appliance sooner than later are outweighed by the environmental benefits related to the energy savings of using a more efficient model. See for example: Iraldo, F., Facheris, C. and Nucci, B. Is product durability better for environment and for economic efficiency? A comparative assessment applying LCA and LCC to two energy-intensive products. *Journal of Cleaner Production*, 140, pp.1353-1364.2017.; Ardente, F. and Mathieux, F. Environmental assessment of the durability of energy-using products: method and application. *Journal of cleaner production*, 74, pp.62-73. 2014; and Reale, F., Castellani, V., Hischier, R., Corrado, S. and Sala, S.. Consumer Footprint-Basket of Products indicator on Household appliances. Technical report. European Commission, Joint Research Centre. 2019.

⁴¹⁹ The results of a JRC study showed that, "for the global warming potential, prolonging the lifetime of a washing machine and dishwasher case studies is environmentally beneficial when the potential replacement product has up to 15 % less energy consumption during the use. For the abiotic depletion potential impact, mainly influenced by the use of materials during the production phase, prolonging the lifetime of both machines was shown always to be beneficial, regardless of the energy efficiency of newer products. Freshwater eutrophication showed a great influence by the impact of the detergent used during the use phase; thus, prolonging the device's lifetime is still beneficial for this impact category, although the benefits are negligible compared to the life cycle impacts of the products.". See <https://op.europa.eu/en/publication-detail/-/publication/72cd56e4-bab7-11e6-9e3c-01aa75ed71a1/language-en/format-PDF/source-126402524>.

⁴²⁰ See for example Estevan, H., Schaefer, B. and Adell, A., 2017. Life Cycle Costing State of the art report. Local Governments for Sustainability, European Secretariat. Available at: https://spregions.eu/fileadmin/user_upload/Life_Cycle_Costing_SoA_Report.pdf.

⁴²¹ Bakker C, Wang F, Huisman J, Den Hollander M: Products that go round: Exploring product life extension through design. *J Clean Prod* 2014, 69:10–16.

Faster obsolescence of products is a growing concern for consumers. In their reply to the Open Public Consultation to support the Consumer Empowerment Impact Assessment, 76% of respondents (and 89% of citizens) mentioned they had experienced an unexpected failure of products in the past 3 years⁴²⁵. ICT products (47%), small household appliances (20%), clothing and footwear (19%), other electronics (18%), large household appliances (16%) and software programmes (15%) were most often cited product categories for unexpected failure.

On top of these cases of early obsolescence, there have also been a number high-profile cases of **planned obsolescence**, such as software updates having an impact on the performance of phones and accelerating their replacement, although consumers were not informed thereof⁴²⁶. It is important to note, however, that a number of manufacturers/retailers argue that planned obsolescence does not exist as a practice, and that shorter lifespans are impacted by consumer behaviour such as poor maintenance and increased use.

Available studies suggest that certain consumer goods have a shorter lifetime than would have been expected for such products in the past^{427,428}. For example, an EU funded project, identified that a significant share of goods tend to fail right after the end of the minimum legal guarantee period (between second and third year) based on consumer reports in seven Member States⁴²⁹. Similarly, a 2015 German Study⁴³⁰ concluded that the percentage of large household appliances replaced by consumers within five years due to technical defects more than doubled, from 3.5% in 2004 to 8.3% in 2012. Several other studies carried out^{431,432,433} present evidence that the lifespan of some goods is becoming shorter, with technical failures being the main reason for product replacement. The project concludes that “a limited number of problem types account for four out of five failures, most of which refer to a specific part of a product, many of which appear to be shared across product categories (e.g. batteries, printed circuit boards and LCD screens)”⁴³⁴.

Another study shows that in the case of smartphones and tablets, a large proportion of the devices are replaced after two years because of a few but frequent problems: (1) the battery stopped working and could not be replaced by the user; (2) the screen cracked and could not be replaced by the user; or (3) the manufacturer was no longer willing or able to support the

⁴²² Bakker, C., den Hollander, M., Van Hinte, E. and Zijlstra, Y., 2019. *Products that Last 2.0: Product Design for Circular Business Models*. BIS Publishers.

⁴²³ Cooper, T. ed., 2016. *Longer lasting products: Alternatives to the throwaway society*. CRC Press.

⁴²⁴ Ruth Mugge, Jan P. L. Schoormans & Hendrik N. J. Schifferstein, 2005. Design Strategies to Postpone Consumers' Product Replacement: The Value of a Strong Person-Product Relationship, *The Design Journal*, 8:2, 38-48.

⁴²⁵ European Commission, *A New Consumer Agenda Factual summary report – public consultation*, 2020, p. 20.

⁴²⁶ Autorità Garante della Concorrenza e del Mercato, *Proceedings initiated against Samsung and Apple for smartphone software updates*, <https://en.agcm.it/en/media/detail?id=4d458a5b-49ad-4d30-80e9-d3e9692fca36> and <https://www.agcm.it/media/comunicati-stampa/2018/10/PS11009-PS11039> (in Italian with more details).

⁴²⁷ United Nation Environment Programme, *The Long View – Exploring Product Lifetime Extension*, 2017, pp 20-24.

⁴²⁸ European Parliament, *Briefing – Planned obsolescence: exploring the issue*, 2017.

⁴²⁹ Research carried out by the PROMPT project, an independent testing programme assessing the lifetime of consumer products. It brings together research institutes, national and umbrella consumer organisations as well as repair companies and platforms. The project has received EU funding under Horizon 2020.

PROMPT Project, *State-of-the-art of consumers' product experiences related to premature obsolescence*, forthcoming.

⁴³⁰ Cited in: European Parliament, *Briefing – Planned obsolescence: exploring the issue*, 2016, p. 3-4.

⁴³¹ Umwelt Bundesamt, *Influence of the service life of products in terms of their environmental impact: Establishing an information base and developing strategies against "obsolescence"*, 2020, p. 85, p. 88, p. 24.

⁴³² European Parliament, *Briefing – Planned obsolescence: exploring the issue*, 2016, p. 4.

⁴³³ M. Depypere, T. Opsomer, *Relevance of Policy Measures to Increase Product Lifetimes: a Literature Review*, 2018.

⁴³⁴ PROMPT Project, *State-of-the-art of consumers' product experiences related to premature obsolescence*, forthcoming.

software⁴³⁵. Recently, national consumer organisations have also received more than 25 000 complaints concerning two components of a gaming console (i.e. its two controllers) which was failing prematurely and made difficult to repair or replace, rendering the console obsolete (well before the lifespan of 7 to 10 years advertised by its manufacturer) and in spite of the manufacturer being aware of the problem⁴³⁶.

Improvements in the production process

The impact reduction potential of product groups can be defined as the difference between the life cycle environmental impact of the average product on the market and a product with amongst the best performance⁴³⁷. Due to data availability limitations, the reduction in climate change impacts is used as a proxy for the whole range of environmental footprint impacts. While 50% is frequently found as reduction potential for a purchase decision (see below), for some product categories, substantially higher savings were found: 80% for cars and 95-98% for electricity and space heating (see more below). Importantly, these percentages should not be taken as an indication of the likely effectiveness of SPI, which will only realise part of this potential.

Vehicles and mobility, person transport services, goods transport

For three specific car example pairs of battery electric vehicles (BEV) versus internal combustion engine (ICE) cars of the same car class, a recent study⁴³⁸ found differences and hence reduction potential for climate change with an average value of - 67%, using the grid mix for electricity production. A more extensive literature review⁴³⁹ finds variation in estimates of the LCA differences in different classes of cars, but does indicate significant potential.

Space heating and cooling systems

Covered within the Ecodesign Directive, changing the space heating mix with an efficient heat pump operated with EU grid mix electricity reduces the climate change impact by 52%. If, in addition, the heat pump is operated by a green electricity mix (see the analysis on electricity below)⁴⁴⁰, the impact reduction is higher: the electricity environmental footprint is by far the main contributor (with the equipment production life cycle-wide impact contributing only to a limited extent).

Concrete

⁴³⁵ Rizos, V., Bryhn, J., Alessi, M., Campmas, A. and Zarra, A., *Identifying the impact of the circular economy on the Fast-Moving Consumer Goods Industry Opportunities and challenges for businesses, workers and consumers—mobile phones as an example*, 2019, p. 19, p. 25.

⁴³⁶ https://www.beuc.eu/publications/beuc-x-2021-002_nintendo_-_premature_obsolescence_complaint_to_the_ec.pdf

⁴³⁷ See the Green Claims Initiative Impact Assessment for further analysis

⁴³⁸ Auke Hoekstra & Maarten Steinbuch (2020): Comparing the lifetime greenhouse gas emissions of electric cars with the emissions of cars using gasoline or diesel. Eindhoven University of Technology.

⁴³⁹ *Determining the environmental impacts of conventional and alternatively fuelled vehicles through LCA*, Ricardo Energy and Environment, 2020

⁴⁴⁰ For the use phase, the PEF method requires to use the grid mix of the country of consumption. The analysis shall reflect the ratios of sales between EU countries/regions. Where such data is not available, the average EU consumption mix or a region-representative consumption mix shall be used.

The main contributor to the environmental impacts of conventional concrete is the cement, being (predominantly) Portland cement. While achieving equivalent concrete functionality, a substantial amount of this can be replaced by ground granulated blast-furnace slag (GGBFS), fly ash and other by- and waste products from other industries, much of which is currently not used but deposited.

The reduction shown for GGBFS is an established case to reduce the impact and it is possible to assume other pathways could also yield benefits. An impact reduction of 50% for climate change can be achieved already with this avenue. Further reduction can be expected, in dependency on different Portland cement production countries, production technologies and management.

Apparel and footwear

A study identified the following range of lowest and highest environmental impacts⁴⁴¹

Table 90 Range of lowest and highest environmental impacts

| | Climate change (kg CO ₂ equivalents) compared to... | | Freshwater eutrophication, compared to... | | Water depletion, compared to... | | Land use, compared to... | |
|----------------------------------|---|-----------------|---|-----------------|------------------------------------|-----------------|-----------------------------|-----------------|
| | Mean values | Worst values | Mean values | Worst values | Mean values | Worst values | Mean values | Worst values |
| Cotton t-shirt ⁴⁴² | -42% | -81% | -40% | -80% | -47% | -80% | -25% | -56% |
| Wool knitwear | -58% | -77% | -60% | -84% | -51% | -70% | -51% | -70% |

By averaging all values, the reduction from mean to best is -46%, which reflects the environmental impact reduction due to purchasing a product that has a top class of performance as opposed to buying a product of unknown impact.

Raw materials from agriculture

For cotton growing per kilogram a 50% reduction respectively to mean values and 78% respectively to worst values were found. A 50% reduction value for the purchase of any renewable raw material, reflecting the environmental impact reduction due to purchasing material that has a top class of performance as opposed to buying a product of unknown impact.

⁴⁴¹ 2nd Edition of the Environmental Impact Valuation as base for a Sustainable Fashion Strategy. White paper Hugo Boss. Heinz Zeller, Rainer Zah, Michela Gioacchini and Mireille Faist

⁴⁴² Per piece of the same size. Note that this table does not yet consider the purchase change between natural and synthetic fibre, which are expected to yield a higher reduction potential, than within the cotton T-shirt variants.

1. HOW SPI WILL WORK IN PRACTICE

Case study A: The case of Denim Jeans

Disclaimer: this case study has been drafted to provide an indication of how SPI measures could be developed under the future legal instrument and the typology of requirements they could include. The choice of jeans as a product and thresholds and requirements used are included only to illustrate functioning of the SPI on a specific product category. They should not be understood as an indication of what future SPI measures on textile will include.

Background

Europe is a major market for denim fabric, which is mostly used for trousers. In 2019, there were 9.2 billion euros of imports, primarily from Bangladesh, Turkey and Pakistan (the three account for 67.8% of all denim imports into the EU)⁶. Germany, France and the Netherlands are predominant users and importers within Europe, as they represent 46% of intra-EU trade. The EU also has a large export of denim garment products, worth about 6.2 billion euros in 2019. Germany, Spain, the Netherlands and Italy are the main exporters.

1.1 The environmental and social cost of producing a pair of jeans

A pair of jeans contains 30 separate pieces of textile and accessories (fasteners, buttons) are required⁴⁴³. Most jeans are made from 100% cotton denim, although blended fabrics are increasingly used.

An example of jeans value chain production could start in India, which is the largest cotton producer in the world, or in Pakistan, which is also a major producer. The cotton would then be woven into fabric and dyed in Pakistan, with synthetic tincture made in China. The individual pieces would be assembled in Pakistan, due to cost factors and knowhow, with zips made in Japan, buttons produced in the Democratic Republic of Congo (DRC) and rivets from Australia. The jeans would finally be aged in Bangladesh to be distributed all over the world – including in Europe⁴⁴⁴.

Overall, one pair of denim jeans emits around 20 to 40kg of CO₂ – including cotton culture, the use of agricultural machinery, the journey of the components, and the spinning, weaving and assembly work in the factory⁴⁴⁵. A pair of 501 Levi's jeans would have the following distribution of CO₂ emissions⁴⁴⁶:

⁴⁴³ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

⁴⁴⁴ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

⁴⁴⁵ Petit R., January 2021. *Le denim : quel est l'impact social & environnemental de nos jeans ?* [Denim: what is the social & environmental impact of our jeans?], The Good Goods.

⁴⁴⁶ Levi Strauss & Co., 2015. *The life cycle of a jean – understanding the environmental impact of a pair of Levi's® 501® jeans*.

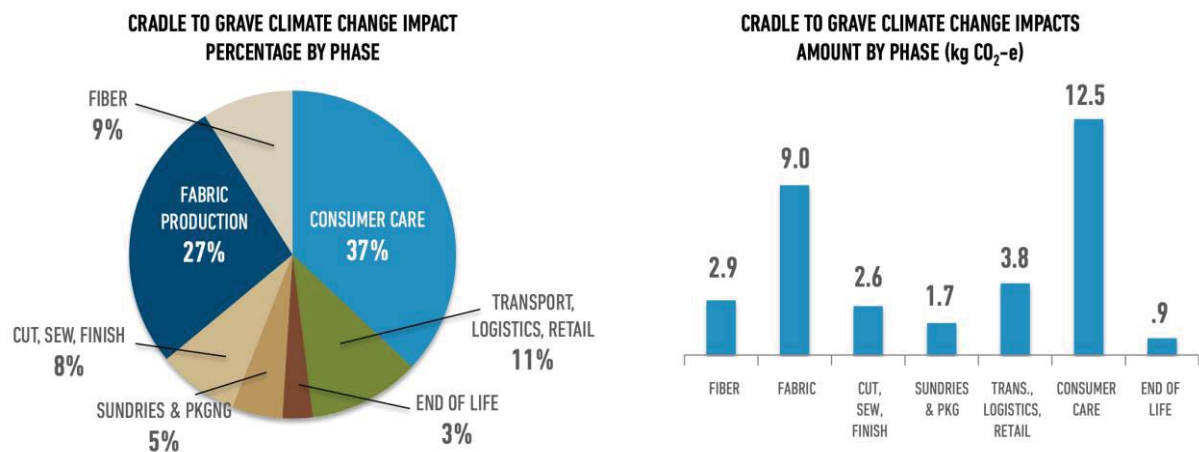


Figure 3 Levi's® 501® jeans: climate change impact

About 1 kilogram (kg) of cotton is necessary to manufacture one pair of jeans, which requires 2 kg of fertilizer and 75 grams (g) of pesticide⁴⁴⁷. Besides cotton, the 2.3 billion jeans manufactured each year consume 95% of global indigo tincture production. Production of 1 kg of synthetic indigo requires 1 tonne of oil, 9 kg of toxic solvents and 1000 litres of water. As this tincture is not soluble in water, the treatment of wastewater requires sodium dithionite, which produces sulphate and sulphite, both potent pollutants. The “worn in” look can be obtained through chemical bathing with acids, enzymes, bleach and formaldehyde, sandblasting or stone washing, with pumice⁴⁴⁸. These processes produce hazardous fumes and dust to which workers are, for the most part, directly exposed.

Workers are most often not protected against the health risks related to the pesticides and chemicals involved in the production of a pair of jeans, as they generally work without a contract and / or without social security benefits⁴⁴⁹. With a salary below the minimum wage, workers can barely afford housing, food, education, and medical treatment. Child labour is also common across the production line, because of the strong demand for cotton and garments, poverty, and weak legislation⁴⁵⁰.

Wages remain low and working conditions bad in the supply chain because of the fierce competition on price between brands and of the complex and thus opaque chain of multilayer subcontracting that has been implemented by multinationals, which too often enables them to claim that they are not aware of what happens, and of the high demand for cheap garments, especially since the rise of fast fashion⁴⁵¹. In the past 15 years people have bought 60% more clothes but use them 36% less. This global figure hides major variations, with much higher clothing utilisation rates in many low-income countries masking worse and rapidly declining performance in other regions⁴⁵². With fashion trends evolving fast, new models of clothes arrive in store 6 to 12 times a year.

1.2 Usage and end of life

The maintenance and end of life of a pair of jeans represents 40% of the total GHG emissions of their whole life cycle, including production, as they are often washed⁴⁵³. This requires energy, and this need

⁴⁴⁷ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

⁴⁴⁸ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

⁴⁴⁹ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

⁴⁵⁰ International Labour Organisation, 2016. *Child labour in cotton: a briefing*

⁴⁵¹ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

⁴⁵² Ellen Macarthur Foundation, 2017. *A new textiles economy: Redesigning fashion's future*.

⁴⁵³ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021

is multiplied by 5 to 6 if a dryer is used. In addition, this increases the quantity of wastewater that must be treated.

When it comes to the end of life of worn jeans, consumers can sell them, throw them away or donate them⁴⁵⁴. Donations are sorted to be:

- Recycled into textile products like carpet padding, painter's cloths, or insulation;
- Donated to people in need;
- Sold in thrift shops. After a certain amount of time, they are exported to developing countries, to find a second life there. However, garments often end up being burnt, which impacts the local environment and inhabitants as developing countries generally do not have the suitable infrastructure to discard them safely⁴⁵⁵. It has been shown that 40% of the clothing traded at the Kantamanto Market (Ghana) ends up in landfill almost immediately due to its poor quality⁴⁵⁶.

From end 2024 it will be obligatory to separately collect textiles in municipal waste across the EU⁴⁵⁷. A significant increase in this waste stream can therefore be expected, with less going to landfill or incineration as mixed waste.

Nowadays, the mechanical recycling of jeans is encounters challenges if they are composed of blended fabrics (cotton / polyester, cotton / elastane, cotton / polyester / elastane which are required for close-fitting cuts; cotton / cordura or Kevlar for professional clothing)⁴⁵⁸. Fibres recycled from mechanical processes always require to be spun with virgin fibres due to loss of properties and performances of the material. For synthetic fibres such as polyester, the amount will be higher but never 100% of the total material. Setting requirements for substances, for levels of recycled content in jeans, and for the enabling of high-end recycling could trigger stronger demand of recycled fibers. For instance, the "MonCoton" project aims to make jeans out of 100% recycled cotton fibre⁴⁵⁹. This could be beneficial for textile recyclers as this would equate to more business opportunities, and for workers who handle the substances.

In France, where the Extended Producer Responsibility (EPR) for clothing has been implemented⁴⁶⁰:

- 10,1% of the garments are recycled into industrial wiping cloth and 23,4% into new textiles, geotextile (for insulation) and secondary raw material;
- 57,8% are resold in France or abroad;
- 8,2% are transformed into solid recovered fuel or incinerated for energy recovery;
- 0,5% is landfilled.

However, at a global scale, 73% of clothing end up incinerated or landfilled⁴⁶¹. At EU level EPR is obligatory for packaging and electronic and electrical equipment, but there are calls for extension to textiles.

⁴⁵⁴ Matteis S. & Agro C., January 2018. *What really happens to old clothes dropped in those in-store recycling bins*, CBC News.

⁴⁵⁵ Matteis S. & Agro C., January 2018. *What really happens to old clothes dropped in those in-store recycling bins*, CBC News.

⁴⁵⁶ The OR Foundation, *Dead White Man's Clothes*.

⁴⁵⁷ Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste

⁴⁵⁸ Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021
ChemSec, February 2021. *What goes around – Enabling the circular economy removing chemical roadblocks*.

⁴⁵⁹ The MonCoton project is financially supported since 2019 by the French environmental agency Ademe operating the Investment for Future Programme ("Programme des Investissements d'Avenir") https://www.ademe.fr/sites/default/files/assets/documents/laureats-concours-innovation-inov-ia-2019_010872.pdf

⁴⁶⁰ Re_fashion, n.d. *Que deviennent vos textiles et chaussures usagés une fois déposés dans un point d'apport volontaire ?* [What happens to your used textiles and shoes once they have been deposited at a voluntary collection point?]

⁴⁶¹ Ellen Macarthur Foundation, 2017. *A new textiles economy: Redesigning fashion's future*.

2. IMPACT OF THE SPI PREFERRED POLICY OPTIONS

The section below is an attempt to describe how each of the preferred options in different areas of the SPI would impact the jeans value chain, the costs, and provide few example of possible requirements. Insights have been provided by industry associations and companies representing hundreds of textile brands including jeans brands. These have consulted some of their members and impacts have been quantified to the extent possible.

This case study assumes the availability of a Product Environmental Footprint Category Rules (PEFCR)⁴⁶² combined with the use of other tools and sources of information.

2.1. PO2b: Extension of the product scope of Ecodesign legislation to all physical goods

The product scope should be defined based on the “function” that the product performs and/or the consumer perception when buying products belonging to a certain group. This means, for example, that it would not be appropriate to include jeans in the same product group as t-shirts (even if they are both apparel products), as their main function is to cover different parts of the body). Following this approach, jeans could be put in the same product group with casual pants, dress pants, sport pants, shorts, etc. There would be no differentiation between sizes and gender, as these factors do not affect in a relevant way the production process and technical requirements for these products. Therefore, while for sake of simplicity we will refer to “jeans” in this case study, the information provided could be applied to all types of trousers and shorts.

With the **extension of the product scope of Ecodesign legislation to all physical goods**, jeans would have to comply with mandatory ecological requirements on aspects such as durability, reparability, high-quality recycling, water use, material use, polluting emissions, etc. The Ecodesign legislation could help diminish the negative impacts and external costs associated with the production and end of life, and support the adoption of less impactful innovations.

2.2 PO3b: Far-reaching sustainability requirements for products

The identification of the sustainability requirements (performance and information requirements) is based on the results of a technical, environmental and economic analysis carried out by the Commission in close consultation with stakeholders.

As far as the environmental criteria, the main source of information is the hotspot analysis included in the PEFCR. The entire life cycle (from cradle to grave) of the jeans is considered, including the raw material production (including that of packaging), manufacturing, distribution, use, and end-of-life life cycle stages. The hotspot analysis informs which are the most relevant impact categories, life cycle stages, processes and emissions related to “jeans”.

For example, in the case of jeans, the most relevant impacts would be: Climate change (25% of the total impact), Resource use, fossils (15%), Water use (14%), Ecotoxicity, freshwater (8%), Particulate matter (7%), Acidification (6%), Eutrophication, freshwater (6%).

Based on the information included in the PEFCR and additional source of information, the following requirements could be included:

⁴⁶² Currently under development as part of the Environmental Footprint transition Phase

Minimising environmental footprint

- **Maximum climate change impact** per item: [xx] kg CO_{2-eq}
- **Maximum resource use** (fossils): [xx] MJ
- **Total environmental impact** requirement: Total environmental impact calculated against the 16 PEF impact categories no higher than [xx] points⁴⁶³.
- **Minimum requirements at process level**, for example on spinning, weaving, bleaching, and finishing, as an alternative or in combination with previous requirements.

Having requirements on the whole life cycle would mean that the jeans manufacturer will have the freedom to identify where it is more cost effective to intervene in order to reduce the climate change impact and resource use, based on the way the production process is organised and the relationships with his/her suppliers.

This requirement implies that each manufacturer should carry out a PEF study on the product in scope. The average cost to conduct a PEF study based on a PEFCR is €3,950 and €1,185 for the update of such a study (covering expert costs, data collection costs, verification costs).

The company producing the jeans should not perform a calculation for each pair of jeans produced. The calculation should only be done on the product prototype size, defined as the median size of brand's own specific sizing chart. The most "impactful" colour available for the jeans produced should be chosen for the calculation (as a sort of worst-case scenario).

A new calculation would be required only when there are important changes in the bill of materials, with differences in terms of environmental impacts expected to be higher than 5% of the total impact or 10% of one impact category.

The company producing jeans would be asked to introduce in an IT-calculator provided by the Commission, the following data:

- Bill of materials, i.e. the list of all the raw materials, resources, components, assemblies and parts - and the quantities of each of them - that are required to manufacture a product;
- Data related to the manufacturing process (energy consumption, chemicals used, amount and typology of packaging used, etc);
- Some information about suppliers and clients (geographical location, logistics).

All the other information needed to calculate the environmental profile would be already available in the IT-tool as secondary datasets. This means that no manufacturer, independently from the size or its geographical location, would be penalised for not having access to suppliers' company specific data.

Alternatively, or in combination, minimum requirements at process level could be introduced. The PEFCR allows to identify the most relevant processes (in terms of environmental impacts) as shown in Figure 4:

⁴⁶³ This requirement would be added to avoid possible shifts of burden from one impact category to another.

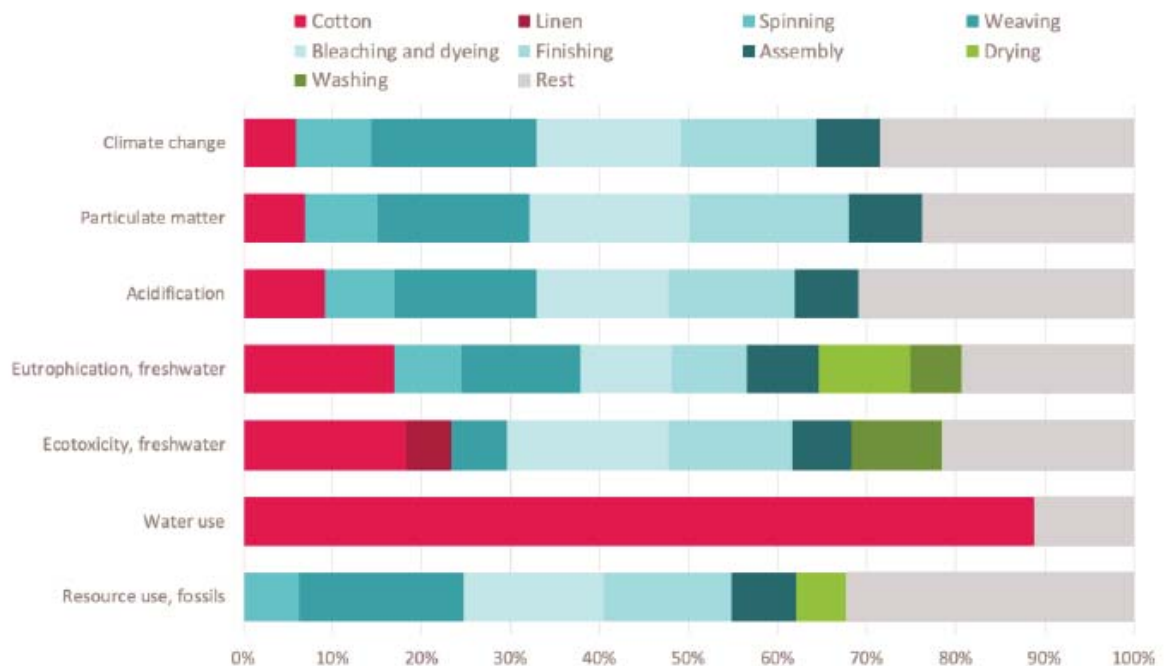


Figure 4. Identification of the most relevant processes in the production of jeans.

Based on this information, and building on other relevant sources of information like BREFs, it would be feasible, for example, to introduce requirements on **spinning**, **weaving**, **bleaching**, and **finishing**, which the PEFCR identifies among the most relevant processes for jeans production.

Circularity requirements

- Durability 1: the jeans shall be able to withstand a minimum of 30 home laundries.** The manufacturer shall prove the compliance with this requirement through one of the following test methods: ISO 6330 4N with ISO 5077 wash/dry conditions based on care instructions, AATCC Monograph M6, according to care label and ISO 5077, AATCC Monograph M6, according to care label and AATCC 124.
- Durability 2: provide an information on how to care for jeans visibly on the garment.** The jeans shall include accessible label that states:

 - Information on reducing washing frequency;
 - Instructions to wash at low temperatures (30°C or below);
 - Instructions to avoid tumble drying.
- Recyclability 1: the jeans are made with chemicals that comply with level 1, zero discharge of hazardous chemicals manufacturing restricted substance list as a minimum.** Companies may verify conformance with ZDHC requirements of at least level 1 through the ZDHC ‘Gateway’ . Examples of methods that could be used to verify safe chemistry beyond ZDHC Level 1 include, but are not limited to: Bluesign and Cradle to Cradle Certified™.

- **Recyclability 2: include a minimum of [X%] cellulose-based fibres by weight in the total textile composition.**
- **Recyclability 3: include a minimum of [X%] post-consumer recycled content on average (by weight) of the total fabric composition.**
- **Recyclability 4: metal rivets are removed entirely or reduced to a minimum.**
- **Recyclability 5: enable easy disassembly of any additional material that is added to the fabric (accessories, metals, radio-frequency identification-RFID, etc.).**

A consumer survey in UK suggested that clothes were disposed, resold or donated because they did not fit anymore (42%), because the owner did not like them anymore (26%), or because they were damaged, stained, worn out or lost their shape (19%)⁴⁶⁴. **With the implementation of sustainability requirements** for jeans in terms of durability, reliability, reparability and upgradability, the significance of these reasons for disposal could be reduced. The harmonisation of these requirements would, in addition, limit the incurred costs for the companies⁴⁶⁵.

The benefits from the sustainability requirements would depend on the number and types of tests to be performed by the companies, and the approach to ensure compliance⁴⁶⁶. It is to be noted that the durability of the garments (seam slippage, tearing strength, and appearance after wash) is already tested by the majority of retailers: the cost inferred by that criterion would be principally linked to the use of better-quality materials and accessories⁴⁶⁷.

Due diligence requirements

Production of jeans includes as significant producers: USA, India, Brazil, Turkey, Pakistan, Italy, Bangladesh, China.

Should evidence stemming from a preparatory study indicate that specific risks of negative social impacts exist in the jeans value chains and that they are not sufficiently addressed by existing instruments (e.g. because more tailored or stringent rules are needed) the SPI measure on jeans could set requirements on due diligence. The requirements regarding **supply chain due diligence** would enable a greater transparency, which could lead to an increased trust from customers. This would provide a competitive advantage to some companies, which could increase turnover. Furthermore, this could improve working conditions along the supply chain, as companies would have the duty to detect, mitigate and remedy the potential adverse effects of their operations on their supply chain.

The requirement could be that manufacturers or importers need to prove compliance with the OECD Due Diligence Guidance for Responsible Supply Chains in the Garment & Footwear Sector. In particular, compliance with Modules 1 to 7 and 11-12 may be proven.

As an example, the cost ranges provided by a study on Quantifying the Costs, Benefits and Risks of Due Diligence for Responsible Business Conduct carried out for the OECD are that costs for economic operators per company might be:

- One-off costs in the region of 40k€ to 300k€
- Annual recurring costs in the region of 40k€ to 500k€, of which, audit costs in the region of 13.500€ to 22.500€ for small companies / 90.000€ for large companies.

⁴⁶⁴ Ellen Macarthur Foundation, 2017. A new textiles economy: Redesigning fashion's future.

⁴⁶⁵ Textile industry company's input in the stakeholder survey, October 2021

⁴⁶⁶ Textile industry company's input in the stakeholder survey, October 2021

⁴⁶⁷ Textile industry expert's input in the stakeholder survey, October 2021

It should be noted that this applies to full due diligence system relating to different risks, where SPI due diligence obligation would relate to one or more specific risks linked to jeans. Moreover, where companies are subject to other due diligence obligations, they will be able to integrate the more specific or stringent SPI due diligence obligation into that system. The costs implied by potential SPI due diligence are therefore expected to be lower if a company is already doing due diligence by virtue of other instruments or initiatives.

Monitoring and providing the data will represent a cost for companies. A stakeholder survey with 180 responses from businesses and sectoral / businesses organisations from all sectors indicated that the yearly cost of participating to initiatives⁴⁶⁸ or of using specific methods⁴⁶⁹ ranged between EUR 5,000 and EUR 2 million⁴⁷⁰. Several elements influence this cost: the scope of the due diligence framework, the inclusion of the whole value chain (which can implicate different type of actors which have different capacities) or not, the harmonisation or not of the monitoring and enforcing mechanisms across the MSs⁴⁷¹; but also training of the staff, training of the suppliers, using better quality suppliers, etc.⁴⁷²

However, the data can be used for several initiatives (e.g. requirements regarding supply chain due diligence under PO3b, DPP under PO4b, ecolabels, class of performance and GPP under PO5b), can help identify the specific strengths and weaknesses of the product, and can lead to new business opportunities. The benefits in relation to mitigation of potential reputational risks for companies should also be taken into consideration.

Class of performance

PEFCRs allows for building classes of performance on “sustainability” based on the 16 PEF indicators (total score) or based on one of the impact indicators included (e.g. climate change).

A possible class of EF performance for jeans is included in Table 91 (dummy values). The table reports two alternative possibilities: either classes of performance on the total environmental impact of the jeans or classes of performance built around one impact category (climate change is used in Table 91) or around specific processes (water use in Table 91).

⁴⁶⁸ Initiatives based on commitments (e.g. UN Global Compact), reporting initiatives (e.g. Carbon Disclosure Project), indices (Dow Jones Sustainability Index), labelling initiatives (e.g. EU Ecolabel), initiatives by partnerships or platforms that are cross-sectoral (e.g. CE 100 network of the Ellen Macarthur Foundation) or sectoral (e.g. Sustainable Apparel Coalition)

⁴⁶⁹ Standards (e.g. ISO 14040-44), other similar methods (e.g. Environmental footprint), methods underlying labelling (e.g. Swiss Ecolabel), certifications (e.g. Rainforest Alliance), reporting methods / organisation-level tools (e.g. UN Global Compact Indicators), rankings (e.g. SJSI Robecosam) and indicators internal to the company

⁴⁷⁰ DG ENV, 2020. *Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods*

⁴⁷¹ Textile industry company input in the stakeholder survey, October 2021

⁴⁷² Textile industry expert’s input in the stakeholder survey, October 2021

Table 91 Classes of performance for jeans.

| Class of performance | Total score (points) | Climate change only (kg CO2-eq) | Water use (m3)* |
|----------------------|----------------------|---------------------------------|-----------------|
| Class A | < 2.07E-05 | < 0.2 | < 35 |
| Class B | 2.07E-05 ÷ 4.19E-05 | 0.2 ÷ 0.4 | 35 ÷ 45 |
| Class C | 4.19E-05 ÷ 5.05E-05 | 0.4 ÷ 0.5 | 45 ÷ 49 |
| Class D | 5.05E-05 ÷ 7.15E-05 | 0.5 ÷ 0.8 | 49 ÷ 90 |
| Class E | > 7.15E-05 | > 0.8 | > 90 |

**excluding the use phase.*

2.3.PO4b: Digital product passport

The European Digital product passport (EU DPP) is expected to further enhance the effects identified for PO3b as it will bring enhanced value chain transparency, make the information more easily available to the different stakeholders, it will increase the efficiency of maintenance, repair and recycling operations, and will make products and related data more comparable and trustworthy..

The EU DPP will be available through a unique identifier accessible through a multi-functional data carrier (e.g. QR code). Scanning the data carrier would give access to information that has been identified as relevant during the preparatory studies, in collaboration with stakeholders and based on the outcomes of a dedicated impact assessment. As an illustrative example, Table 92 lists 2 potential information elements and their corresponding access right (see also figure 5).

Table 92 Information accessible through the EU DPP and access rights per stakeholder

| <i>Information</i> | <i>Typology of information</i> | <i>Roles</i> | <i>Access right⁴⁷³ & scope⁴⁷⁴</i> |
|---------------------------------------|--------------------------------|---------------------------------|---|
| Name of the manufacturer | Common part/Key identifier | Public (P) | Read |
| | | Manufacturers & Importers (M&I) | Create/Change (limited to their company) |
| | | Authorities (A) | Create/Change (limited to the territorial scope of the authority) |
| GTIN (Global Trade Item Number) | Common part/Key identifier | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| TARIC | Common part/Key identifier | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Documents supporting legal compliance | Common part/Key identifier | P | No access |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Track & trace | Common part | P | No access |
| | | M&I | Create/Change (company) |
| | | A | Read (territory of Public Authority) |
| Manuals | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Environmental footprint | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |

⁴⁷³ “Read” Access means that the role (e.g. public, manufacturer, importer, public authority) can read the information concerned (e.g. TARIC, manuals) in the EU DPP but cannot create it or change it. “Create/Change” means that the role can read, create and change the information in the EU DPP. “No access” means that the role has no access to the information (e.g. TARIC, bill of materials)

⁴⁷⁴ Scope indicates if there is a limitation to the access right (e.g. read/create/change). Potentially, a public authority could have access to all the information needed to exercise market surveillance for products in its own market.

| <i>Information</i> | <i>Typology of information</i> | <i>Roles</i> | <i>Access right⁴⁷³ & scope⁴⁷⁴</i> |
|---|--------------------------------|--------------|---|
| Spare parts availability | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Recycled content | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Bill of materials | Attribute | P | No access |
| | | M&I | Create/Change (company) Read (supply chain) |
| | | A | Read (territory of Public Authority) |
| Durability | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Substance of concern included in the plastic components | Attribute | P | No access |
| | | M&I | Create/Change (company) Recyclers / remanufacturers can access all |
| | | A | Read |
| Dismantability instructions | Attribute | P | No access |
| | | M&I | Create/Change (company) Recyclers / remanufacturers can access all |
| | | A | Read |

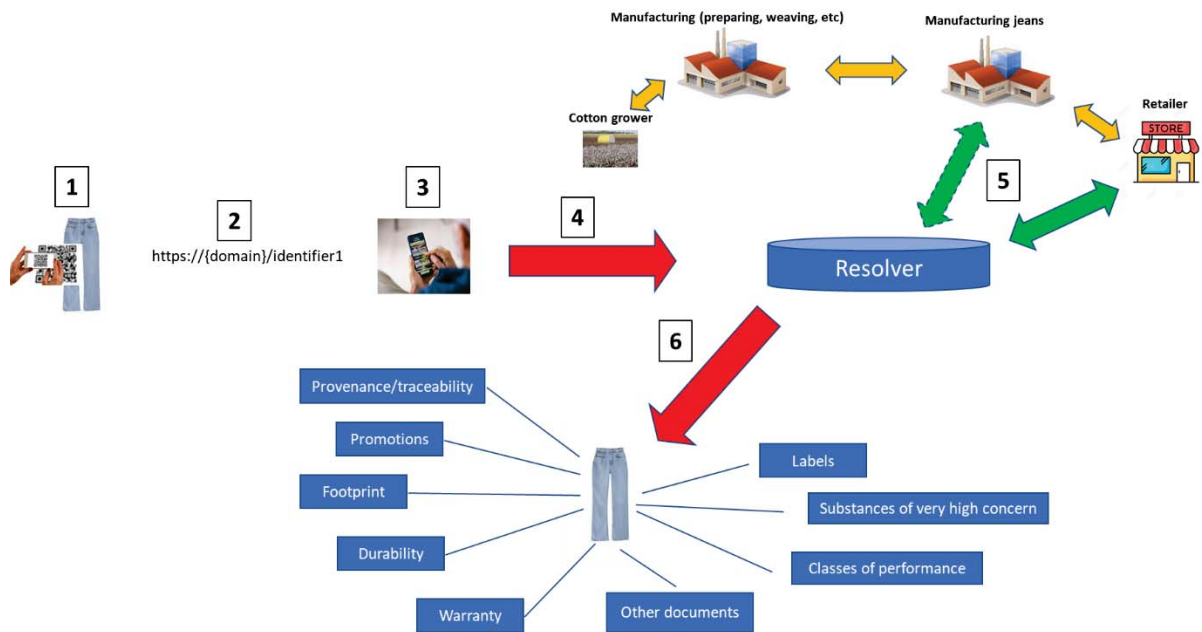


Figure 5 Multi-function data carriers in action: the example of a pair of jeans

[1] A user scans an unique identifier through an app; [2] the app reads the digital link identifying the product scanned and [3] asks back to the user to select what information (s)he is interested in. Once the selection is done this information is passed to the resolver that identifies the corresponding “link types” and [5] connects to the web pages where the different information is stored. [6] Once the information is accessed to, the resolver sends back to the user, via the app, the information selected to which the user has access rights.

Existing private digital tagging initiatives⁴⁷⁵ have proven effective in improving the efficiency and reducing the costs for brands in monitoring and verifying due diligence along their supply routes. For example this can enable several brands to share information on inspections of factories and on sustainability performance of suppliers rather than carrying out multiple and duplicating inspections. The existence and success of such private initiatives indicates a strong business case and motivation for traceability and access to relevant data⁴⁷⁶.

2.4. PO5b: Linking incentives to performance

The implementation of reputational incentives would lead to an initial expenditure for research and innovation and for data monitoring to comply with the requirements. This cost could be shared across several initiatives (DPP, economic and reputational incentives), which would reduce the overall burden. It is also critical to underline that such requirements will need to go hand in hand with support by the EU and Member States, including financial support, in order to ensure the capacity building to establish and implement a structure able to deliver the enforceability of the requirements by public authorities and the compliance and traceability of information by industrial actors (e.g. infrastructures and digital skills, clear set of information to share, etc.)

⁴⁷⁵ Case Studies — TrusTrace – Traceability as a Service

⁴⁷⁶ EON | Circular Product Data Protocol | CircularID Initiative (eongroup.co)

Qualifying for reputational incentives could equate to a competitive advantage and to financial gains for businesses, especially as economic incentives would encourage consumers to turn to sustainable products and increase their awareness regarding their social and environmental impacts. Economic incentives could, in addition, support the transition towards circular business models (CBMs). Reputational incentives are expected to have significant positive environmental impacts: labels can lead to a 18% reduction of GHG emissions, and a 43% reduction of impact on water eutrophication for a cotton t-shirt using 70% of recycled materials⁴⁷⁷.

Even though the specific case of jeans could have a limited effect in this regard due to the functionality of the product, mandatory green public procurements would also support the shift towards more sustainable production practices for uniforms, workwear and other industrial garments, especially as there are often durability requirements. For instance, the Netherlands have set a target of a 50% reduction in raw material use by 2030⁴⁷⁸. EUR 102 million are spent each year by the Dutch government agencies for workwear, which represents 1% of the overall Dutch expenditure on clothing. Some government bodies, such as the Dutch Enterprise Agency, have used GPP to support this ambition, by setting the use of recycled fibre as a beneficial criterion. Another example is the French Ministry of Defence that spends around EUR 170 million annually to clothe 240,000 people. In 2010, it established a single-operator framework agreement, with requirements on the use of organic cotton and excluding a list of hazardous and toxic substances, for the supply of 150,000 cotton jerseys over three years⁴⁷⁹. The municipality of Herning (Denmark) set the recycling of workwear as one of the objectives for their procurement in 2014. Targeting the end of life as a criterion within procurements also has the potential to accelerate the scale-up of CBM for clothing – and more specifically for jeans⁴⁸⁰.

Setting up EPR systems for textiles, whose fees would be modulated according to the class of performance, could encourage companies to increase the durability of their jeans to reduce the additional expenditure EPR would represent. It would increase the quantity of jeans that is recycled, as the French system has shown. Eco-modulation according to classes of performance is expected to have a better impact compared to a fixed approach. In addition, a harmonised eco-modulation across the European Union would ensure coherence and alignment with product requirements under the SPI, support the secondary material market, the development of recycling technologies and heighten the impacts of the EPR schemes. Industry could reduce costs for EPR implementation in case of stronger cooperation⁴⁸¹.

2.5. PO6b: Enhanced value retention

Although an extended durability of jeans would be desirable, it might not lead to “replac[ing] primary production or slow[ing] the consumption cycles”: wardrobes can be expanded as a result of the low price of clothing in second-hand shops, which might have negative environmental impact as well⁴⁸². Besides, older clothes contribute to microfibre pollution, as they shed more microfibres than new ones⁴⁸³, although this might not be as relevant for jeans as denim is in principal made out of cotton.

⁴⁷⁷ RDC Environment for ADEME, 2020. *Définition de critères d'éco-modulation applicables à la filière REP TLC* [Definition of eco-modulation criteria applicable to the TLC EPR sector].

⁴⁷⁸ Ellen Macarthur Foundation, 2017. *A new textiles economy: Redesigning fashion's future*.

⁴⁷⁹ European Commission, 2012. *Green Public Procurement – A collection of good practices*.

⁴⁸⁰ European Environment Agency, November 2019. *Textiles in Europe's circular economy*.

⁴⁸¹ Textile industry companies and business organisation's input in the stakeholder survey, October 2021

⁴⁸² Levänen J., Uusitalo V., Härri A., Kareinen E. & Linnanen L., May 2021. *Innovative recycling or extended use? Comparing the global warming potential of different ownership and end-of-life scenarios for textiles*.

⁴⁸³ Chemycal, June 2016. *Patagonia Study Finds Synthetic Microfibers from Fleece Jackets Are Severe Pollutants*.

Those elements will have to be considered in full life-cycle analyses to determine the optimal option for jeans production and consumption.

More durable jeans, through PO6 but also other policy options, would make them the preferred choice for leasing, repair and reuse models, and for product-as-a-service models of the textile cleaning industry.

A ban on the destruction of unsold goods could be applied to jeans via an SPI measure. In principal small retailers would not be affected by the ban as it would apply to large companies. These may improve stock management to prevent product surpluses and may look for alternatives to destruction, such as sale at a reduced price or donations. Some jeans may still be destroyed under exemptions to the ban, for instance in case returned jeans turn out to be damaged. Companies will have to provide transparency on the amount of jeans destroyed under exemptions, which would dis-incentivize the use of exemptions to circumvent the ban. After its introduction a ban on the destruction of unsold jeans (probably as part of an SPI measure focusing on a broader product category such as garments in general), it is expected that fewer unsold jeans are discarded. For instance, France estimates that for textiles, on a market of about 600,000 tonnes of textile every year⁴⁸⁴, its national ban on destruction of unsold goods could avoid the destruction of 1,7-3,3% of that textile per year⁴⁸⁵.

2.6. PO7b: Strengthen market surveillance by Member States

Streamlining the procedures for the development and adoption of Ecodesign regulations is expected to accelerate the adoption of SPI measures, such as the collection of data from apparel manufacturers and retailers regarding their sales and usage of jeans and the expansion of provisions related to third party conformity assessment. These measures would lead to a better and refined understanding on the weight of this specific garment in the overall clothing industry in Europe. The expansion of the provisions related to third-party conformity assessment is also expected to lead to improvements for non-compliant articles and to increase the traceability of jeans. The possibility for citizens to report suspected cases of non-compliance could increase their vigilance towards business practices.

An increase of market surveillance and customs controls capacity is expected to accelerate the adoption of other policy measures by businesses, as there would be more means within the European Commission to support that shift. Again, compliance and enforcement would be facilitated through the existence of the digital product passport.

⁴⁸⁴ French Ministry of Environment 2020, Textile usagés, <https://www.ecologie.gouv.fr/textiles-usages>

⁴⁸⁵ French Ministry of Environment 2020, The anti-waste law in the daily lives of the French people

CONCLUSION

Based on the results of SPI consultation strategy, overall, experts, companies and industry associations have been able to provide limited insights on precise costs and benefits for the different policy options. It would bring a level playing field in the sector as many companies are anyway trying to reduce their carbon footprint. Therefore, there is a strong appetite amongst many players in the textile industry to support stricter regulation in terms of durability. Yet, the capacity to enforce the requirements is crucial in order to achieve the level playing field. If such requirements are not introduced there is a risk for progressive companies to be frontrunners without proper legislation⁴⁸⁶.

Overall, there is a clear support for the different elements of the SPI and the concrete policy options. One of the main arguments for that is that industry is already taking a number of sustainability measures within different global initiatives and the SPI would streamline these initiatives and create a level playing field. Companies have also recognised the benefits and the irrevocable trend for the industry and the society as a whole. They have also acknowledged that costs incurred under the different policy options within the SPI should be potentially looked at as extra costs to what is already being done within a number of companies. The full benefits of the transition would only materialise in case new requirements could be enforced.

Although the impacts presented in this case study apply to jeans, they can be extrapolated to other group products within the textile sector according to the consulted stakeholders.

⁴⁸⁶ Interview with textile industry company, October 2021

References

1. Beton A., Dias D., Farrant L., Gibon T., Le Guern Y., Desaxce M., Perwuelz A., Boufatch I., 2014. *Environmental Improvement Potential of textiles (IMPRO Textiles)*, Publications Office of the European Union. Available online: <https://publications.jrc.ec.europa.eu/repository/handle/JRC85895>
2. C&A, May 2021. *C&A to expand digital and sustainable production in the heart of Europe*. Available online: <https://www.c-and-a.com/uk/en/corporate/company/newsroom/press-releases/2021/ca-to-expand-digital-and-sustainable-production-in-the-heart-of-europe/>
3. ChemSec, February 2021. *What goes around – Enabling the circular economy removing chemical roadblocks*. Available online: https://chemsec.org/app/uploads/2021/02/What-goes-around_210223.pdf
4. Chemycal, June 2016. *Patagonia Study Finds Synthetic Microfibers from Fleece Jackets Are Severe Pollutants*. Available at: [https://chemycal.com/news/345a9d9e-5ece-48ee-9d6f-300abfbf56ff/Patagonia Study Finds Synthetic Microfibers from Fleece Jackets Are Severe Pollutants](https://chemycal.com/news/345a9d9e-5ece-48ee-9d6f-300abfbf56ff/Patagonia%20Study%20Finds%20Synthetic%20Microfibers%20from%20Fleece%20Jackets%20Are%20Severe%20Pollutants)
5. Cité des Sciences et de l'Industrie & ADEME, *Jean*, Exhibition from 8 December 2020-22 January 2022. Visited on 22 June 2021
6. CNN, September 2020. *Asian rivers are turning black. And our colorful closets are to blame*. Available online: <https://edition.cnn.com/style/article/dyeing-pollution-fashion-intl-hnk-dst-sept/index.html>
7. CBI, August 2020. *The European market potential for denim*. Available online: <https://www.cbi.eu/market-information/apparel/denim-trousers/market-potential>
8. DG ENV, 2020. *Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods*
9. Ellen Macarthur Foundation, 2017. *A new textiles economy: Redesigning fashion's future*. Available online: https://www.ellenmacarthurfoundation.org/assets/downloads/A-New-Textiles-Economy_Full-Report_Updated_1-12-17.pdf
10. European Commission, n.d. *Strategy for textiles*. Available online: https://ec.europa.eu/growth/industry/sustainability/textiles_en
11. European Commission, 2012. *Green Public Procurement – A collection of good practices*. Available online: https://ec.europa.eu/environment/gpp/pdf/GPP_Good_Practices_Brochure.pdf
12. European Environment Agency, November 2019. *Textiles in Europe's circular economy*. Available online: <https://www.eea.europa.eu/publications/textiles-in-europes-circular-economy/textiles-in-europe-s-circular-economy>
13. International Labour Organisation, 2016. *Child labour in cotton: a briefing*
14. Levänen J., Uusitalo V., Härri A., Kareinen E. & Linnanen L., May 2021. *Innovative recycling or extended use? Comparing the global warming potential of different ownership and end-of-life scenarios for textiles*. Available online: <https://iopscience.iop.org/article/10.1088/1748-9326/abfac3/pdf>
15. Levi Strauss & Co., 2015. *The life cycle of a jean – understanding the environmental impact of a pair of Levi's® 501® jeans*.
16. Matteis S. & Agro C., January 2018. *What really happens to old clothes dropped in those in-store recycling bins*, CBC News. Available online: <https://www.cbc.ca/news/business/clothes-recycling-marketplace-1.4493490>
17. Pattar A., June 2020. *The inhumanity of Bangladeshi garment factories*, International Policy Digest. Available online: <https://intpolicydigest.org/the-inhumanity-of-bangladeshi-garment-factories/>
18. Petit R., January 2021. *Le denim : quel est l'impact social & environnemental de nos jeans ?* [Denim: what is the social & environmental impact of our jeans?], The Good Goods. Available online: <https://www.thegoodgoods.fr/mode/le-denim-quel-est-limpact-social-environnemental-de-nos-jeans/>
19. RDC Environment for ADEME, 2020. *Définition de critères d'éco-modulation applicables à la filière REP TLC* [Definition of eco-modulation criteria applicable to the TLC EPR sector]. Available online: <https://librairie.ademe.fr/dechets-economie-circulaire/4561-definition-de-criteres-d-eco-modulation-applicables-a-la-filiere-rep-tlc.html>
20. Re fashion, n.d. *Que deviennent vos textiles et chaussures usagés une fois déposés dans un point d'apport volontaire ?* [What happens to your used textiles and shoes once they have been deposited at a voluntary collection point?] Available online: <https://refashion.fr/citoyen/fr/je-recycle?>
21. The Independent, March 2019. *How often should you wash your jeans?* Available online: <https://www.independent.co.uk/life-style/fashion/jeans-wash-how-often-many-times-levis-boss-a8845411.html>

22. The OR Foundation, n.d. *Dead White Man's Clothes*. Available online: <https://deadwhitemansclothes.org/intro>
23. UNECE, May 2021. *UNECE launches 'The Sustainability Pledge' for measurable and verifiable sustainability in the garment and footwear sector*. Available online: <https://unece.org/circular-economy/press/unece-launches-sustainability-pledge-measurable-and-verifiable>
24. WRAP, July 2017. *Valuing our clothes: the cost of UK fashion*. Available online: https://wrap.org.uk/sites/default/files/2020-10/WRAP-valuing-our-clothes-the-cost-of-uk-fashion_WRAP.pdf

Case study B: the case of mobile phones and tablets

Background

Smartphones are a ubiquitous consumer product and have rapidly become an essential of modern life. The EU market for smartphones numbers around 130-160 million units sold each year, a number that has declined over the last decade and plateaued as saturation has been reached, i.e. most purchases are now for replacement by people that already own a phone, rather than by consumers that did not previously own a smartphone. The EU market is served primarily by imports, with very limited numbers of smartphones produced within the EU itself. The EU market is worth approximately €35 billion each year, a value that has increased over the last decade as an increase in average smartphone prices has more than offset the decline in smartphone sales⁴⁸⁷.

The Circular Economy Action Plan 2020⁴⁸⁸ strongly calls for the improvement of product durability, reusability, upgradability and reparability. Inter alia it foresees, under the Circular Electronics Initiative, regulatory measures for electronics and ICT including mobile phones, tablets and laptops under the Ecodesign Directive so that *devices are designed for energy efficiency and durability, reparability, upgradability, maintenance, reuse and recycling*.

The specificities of ICT products, and the need for a dedicated analysis on the relevance and feasibility of imposing requirements on their environmental impacts, were already highlighted in the Ecodesign Working Plan 2016-2019⁴⁸⁹.

A 2020 study from the JRC⁴⁹⁰ concluded that, when seeking to decrease the environmental impacts of smartphones, material efficiency aspects are very relevant. In fact, the direct impacts associated to the life cycle of such devices are mainly shaped by raw material extraction and manufacturing processes. Compared to other ICT products such as computers or TVs, smartphones have a relatively lower use of electricity in the use phase.

Smartphones are currently the subject of at least two important legislative initiatives in the EU:

- (1) on the preparation of Ecodesign and Energy Labelling measures – for which a preparatory study has been published⁴⁹¹ [referred to hereafter as ‘the preparatory study’] and for which an impact assessment is being finalised currently. The Inception Impact assessment related to this initiative, noted that options to be considered included Option 1: no action; Option 2: self-regulation; Option 3: mandatory specific and/or generic Ecodesign requirements; Option 4: Energy labelling; and option 5: a combination of Ecodesign and Energy Labelling. The Ecodesign measures being considered include: improved resistance when accidentally dropped; protection from water and dust; battery accessibility and longevity; availability of software/firmware/operating system updates; product durability; ability of the product to be disassembled; availability of priority spare parts; data deletion and transfer

⁴⁸⁷ Values in this paragraph based on the 2021 preparatory study for mobile phones, smartphones and tablets, the 2021 impact assessment study to assess unbundling of chargers and analysis of PRODCOM data.

⁴⁸⁸ https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

⁴⁸⁹ COM(2016) 773 final

⁴⁹⁰ Cordella, M., Alfieri, F., Sanfelix Forner, J., 2020. Guide for the Assessment of Material Efficiency: Application to Smartphones.

⁴⁹¹ Fraunhofer IZM et al (2021) Ecodesign preparatory study on mobile phones, smartphones and tablets Final Report

functionalities; and, provision of appropriate information for users, repairers and recyclers⁴⁹². Whilst Energy Labelling would provide an energy efficiency index based on battery endurance and capacity, addressing the direct energy consumption of the devices, noting that at 6-16 kWh/year on average that this is much lower than other product groups with energy labels (to be noted, that high values of the proposed energy efficiency index would also be linked to a battery with increased durability, thus improving this aspects alongside with energy efficiency) .

- (2) on the unbundling of chargers from smartphones – for which the EC has in Sept 2021 made a proposal, as part of a revision to the Radio Equipment Directive, to require standard USB-C ports on smartphones, tablets and other small devices; to remove the charger (external power supply) from the sale of these devices; and to establish common fast-charging interoperability standards for phones. This proposal still requires adoption by the Parliament and Council but would have important implications for how the SPI proposal may impact this product group.

National and industry measures are also having an important impact in this fast-moving sector, including the reparability scoring label introduced in France from 2021, and the EcoRating system launched by leading mobile phone service providers and supported by leading mobile network operators (also May 2021)⁴⁹³.

1.1. The environmental and social cost of producing a smartphone

Results of the recent preparatory study on mobile phones, support other LCA work, which shows that the largest share of the environmental impact of a smartphone occurs upstream, and is especially associated with the materials used and, to a lesser extent, impacts occurring in the manufacturing process, see Figure 6, an extract from the preparatory study. The upstream environmental impact, in particular the raw materials usage, is not less than 40% of the total impact for any of the impact categories, and in the case of water, waste and many non-GHG emissions to air, land and water it is much higher. Manufacturing/assembling processes only represent a relatively small share of the modelled environmental impacts. Distribution is also a relatively small share of most impacts, with the energy use impact (transport fuels) registering as significant and corresponding impacts in GHG emissions, Persistent Organic Pollutants and PAHs.

Social impacts are also important in upstream manufacturing with the often scarce, high value materials required in the manufacture of smartphones not always sourced from suppliers with high social and environmental standards. Smartphones require conflict minerals such as Tantalum, Tin, Tungsten and Gold (also known as the 3TG), which are mostly mined in the Democratic Republic of Congo in poor conditions, sometimes in warzones. This is an issue which manufacturers are aware of and responding to, with Apple, Samsung and others carrying out supply-chain audits to attempt to remove such suppliers. Non-profit organisations are also highly active in monitoring the ethical aspects of materials sourcing for mobile phones.

Figure 6 is extracted from the 2021 preparatory study for mobile phones, smartphones and tablets, showing the impact per life cycle stage for various environmental impacts for base case 2, a mid-range smartphone with 6” screen.

⁴⁹² Many more specific measures were evaluated under these categories in the preparatory study.

⁴⁹³ <https://www.ecoratingdevices.com/> - this rates the durability, reparability, recyclability, climate efficiency and resource efficiency of smartphones.

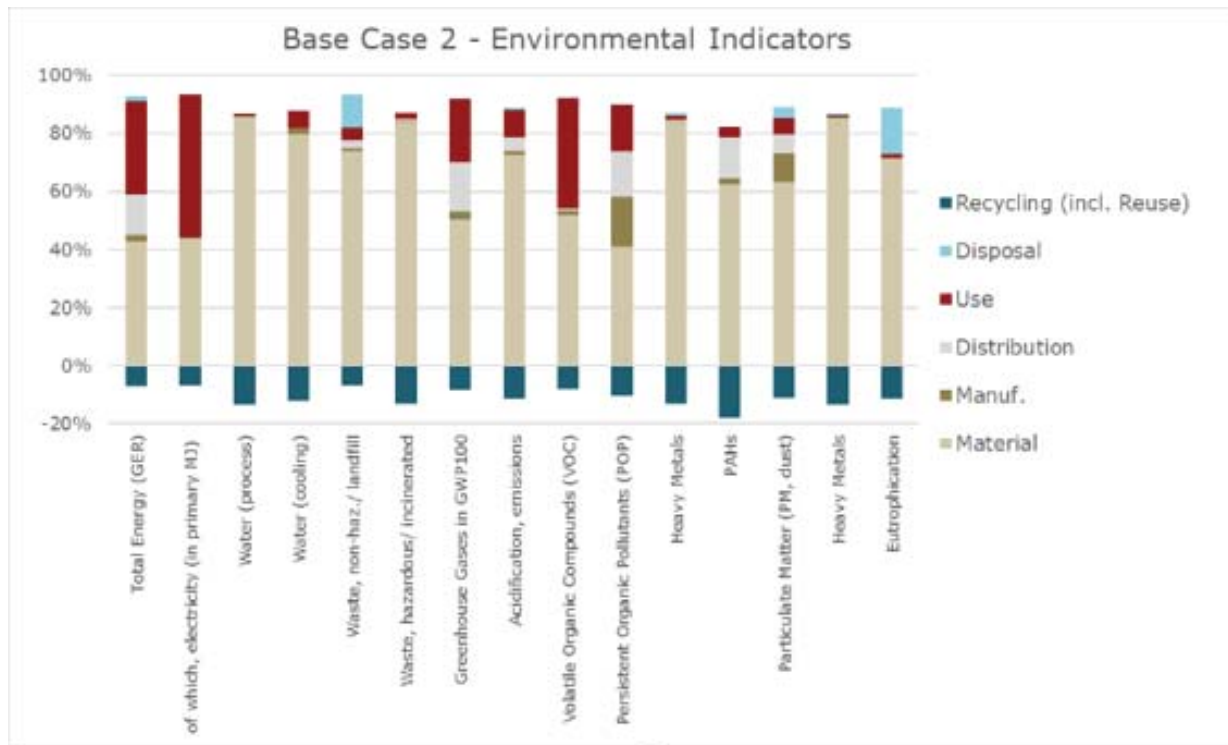


Figure 6 Relative contribution of the life cycle stage based on the EcoReport LCA results

Usage and end of life

As shown in the figure above, the environmental impacts occurring in the use phase of the smartphone life cycle are typically quite small. As expected, the electricity use from charging registers the largest share from the use-phase, around 50% of the total, with corresponding impacts from the electricity use in GHGs and other emissions.

End-of-life impacts from disposal are relatively small shares of the total impact, and only matter in a few categories. Typically end-of-life, through recycling and re-use results in net positive environmental impacts.

However, the end-of-life phase for smartphones is complex with sustainability concerns beyond the direct impact of disposal. On one hand the rapid replacement cycles, often tied to contracts with mobile phone providers, the fast pace of new phone releases and (planned) obsolescence of old phones, leads to a fast turnover of smartphones. On the other hand, there is a thriving market for used smartphones, where re-use, re-sale (often between individuals), giving away, and refurbishment is common. The high value of materials that can be recovered from old smartphones has also led to an active market for recycling of smartphones, to the extent where multiple companies compete to pay consumers to send their old phones for recycling. The preparatory study, on the basis of various surveys concludes that replacement cycle for smartphones has been lengthening over the last decade, with the average in a range of 2-2.5 years before replacement, and around 3-4 years for total active lifetime. Increasing these values could significantly reduce the associated environmental impacts⁴⁹⁴.

⁴⁹⁴ <https://therestartproject.org/the-global-footprint-of-mobiles/>

The accumulation of older smartphones still remains a challenge, as most people have several phones ‘hibernating’ in their drawers⁴⁹⁵. Attempts are being made to improve the collection of these by Producer Responsibility Organisations (PROs) and NGOs.

1.2. Need for EU action

Based on the findings above, the Commission is currently working on the formulation of potential Ecodesign and Energy Labelling Regulations (implementing measures) for mobile phones and tablets, with adoption of these measures foreseen within the first half of 2022. This very ambitious timing⁴⁹⁶ rests on the following reasons/motivations:

- the commitments and deadlines of the Circular Economy Action Plan 2020, and in particular of the Circular Electronics Initiative
- the increasingly perceived importance of circular economy and ecodesign of products by consumers, in particular mobile phones: 77% of the respondents of a Eurobarometer survey⁴⁹⁷ indicated that they would prefer to have their products repaired instead of buying new ones. A 2018 study⁴⁹⁸ from the European Commission showed that consumers were generally willing to consider the durability and reparability of products when purchasing new products. In a survey that took place during 2020⁴⁹⁹, 86% of the participants indicated that they will consider a more robust display when purchasing their next smartphone and 82% stated that they will pay particular attention to the battery lifetime.
- postponing the Ecodesign and Energy Labelling requirements – for whatever procedural or policy aspects by e.g. 3 years (which would be a consequence of bringing them as measures under a revised Ecodesign/SPI) would imply foregoing important environmental benefits. Based on figures from the Ecodesign preparatory study on mobile phones and tablets⁵ it can be estimated that, only considering smartphones, 20TWh of energy would cumulatively be saved within the first 3 years following the introduction of the envisaged Ecodesign and Energy Labelling requirements.
- EU Member States already started proposing national regulatory initiatives in the field of circular economy for mobile phones and tablets. For instance, from 1 January 2021 manufacturers, importers, marketers and other retailers that put smartphones (as well as laptops and other products) on the French market have to inform, free of charge, downstream sellers and any person about the reparability index of their products. Without harmonised EU legislation, the internal market for these products would risk to become increasingly fragmented over the next years.

⁴⁹⁵ The preparatory study notes examples from France and Germany, with tens of millions of smartphones being put into ‘hibernation’ each year.

⁴⁹⁶ From the start of the preparatory study in March 2020, until publication of the Regulations on the Official Journal of the European Union in June 2022, there would be 27 months. The ECA, in the report referred to in Annex 6 of this impact assessment, estimated the duration of the theoretical regulatory process for adopting implementing measures under the Ecodesign and energy-labelling framework to be in the order of 40-42 months, with examples of measures taking up to 96 months to come to finalisation.

⁴⁹⁷ European Commission, Brussels (2014b): Flash Eurobarometer 388 (Attitudes of Europeans Towards Waste Management and Resource Efficiency).

⁴⁹⁸ Behavioural Study on Behavioural Study on Consumers’ Engagement in the Circular Economy. Available online at https://ec.europa.eu/info/sites/default/files/ec_circular_economy_final_report_0.pdf.

⁴⁹⁹ Bitkom e.V. (2020a): Smartphone-Markt: Konjunktur und Trends. https://www.bitkom.org/sites/default/files/2020-02/bitkom-pressekonferenz-smartphone-markt-20-02-2020-prasentation_final.pdf

1.3. What more could be done on smartphones under the preferred option in the SPI Impact Assessment?

It can be interesting to determine if the legal remit under the preferred option in this IA would enable policymakers to enact new classes of requirements, when compared to those contained in implementing measures currently developed under the framework of the current Ecodesign Directive 2009/125.

Specifically referring to smartphones, the following table shows the various classes of requirements under preparation, accompanied by a short description of how the requirements will be enacted/formulated under Ecodesign, together with the potential regulatory approach under the preferred option in this IA.

Table 93 Potential requirements for mobile phones and tablet – under Ecodesign and under SPI

| Requirement class | via Implementing measures under Ecodesign Directive 2009 * | Under the preferred option (PO3b) in this IA | Other upcoming initiatives |
|--|--|---|---|
| Durability | <ul style="list-style-type: none"> - resistance when accidentally dropped, - protection from water and dust, - battery longevity, - availability of software/firmware/operating system updates | <i>(same)</i> | |
| Reparability | <ul style="list-style-type: none"> - ability of the product to be disassembled - availability of priority spare parts | <i>(same)</i> | Synergy with JUST initiative 'right to repair' |
| Preparation for reuse | <ul style="list-style-type: none"> - data deletion and transfer functionalities | <i>(same)</i> | Synergy with ENV initiative on the 'take back' scheme |
| Recyclability | <ul style="list-style-type: none"> - information requirements - dismantlability of certain components | <i>(same)</i> | |
| Recycled material content | <ul style="list-style-type: none"> - (optional) information requirement | Information/quantitative requirements | |
| Environmental impacts of the manufacturing phase | <ul style="list-style-type: none"> - Information requirements | Information/quantitative requirements based on PEFCR? | |

| | | | |
|---|-----------------|--|--|
| Due diligence on the supply chain of products | <i>none</i> | feasible where appropriate based on preparatory studies | |
| Packaging requirements | <i>possible</i> | where appropriate based on preparatory studies, requirements on e.g.: - material content, recycled fraction content, etc. - 'efficiency' of packaging size | |

* Based on the working documents discussed at the consultation forum on 28/06/2021

Table 93 shows that the preferred option is expected to offer policymakers the same regulatory possibilities as the current Ecodesign Directive (which is not surprising, as it can be seen as the 'evolution' of the Ecodesign Directive). This effectively corresponds to the measures included within SPI Policy Option PO3a. However, SPI through the revision of the Ecodesign directive will make sure that these possibilities will be more thoroughly used and enhanced (without contradicting requirement previously set by the "old" Ecodesign directive), particularly through the additions included in the preferred option (PO3b, which include PO3a) and can be more 'effective' in regulating certain specific aspects of the environmental impact of the products, namely via:

- Requirements on recycled material content
- Requirements based on the product environmental footprint
- Social requirements

Ecodesign requirements on the reuse of recycled material content (often also mentioned as 'secondary raw material') have been absent so far from the implementation of the Ecodesign Directive. In fact, establishing the content of secondary raw materials in a given product or component cannot be done through product inspections at the time of the placing on the market, as this would require verification measures throughout the whole upstream side of the supply chain, i.e. starting from the material sourcing. From this point of view, in order to operationalise this kind of requirement further legal solutions – as envisaged by the preferred option in this IA - are necessary.

The envisaged requirements (under the current Ecodesign Directive) for mobile phones and tablets related to environmental impacts of the manufacturing phase are information obligations. In legal terms, the Ecodesign Directive provides a basis for the possible introduction of certain requirements on the environmental footprint of products. The methods for setting new Ecodesign requirements are laid out in Annex I and II of the Ecodesign Directive. Within the ongoing work on potential Ecodesign measures for photovoltaic modules⁵⁰⁰, Ecodesign requirements on the (compulsory reporting of the) carbon footprint of the manufacturing phase of these products are currently being examined. Under the preferred option in this IA, this category of requirements

⁵⁰⁰ Discussion paper on potential Ecodesign requirements and Energy Labelling scheme(s) for photovoltaic modules, inverters and systems, available at: <https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-04/Discussion%20paper%20Ecodesign%20Photovoltaic%20Products.pdf>

could be systematically evaluated and – when relevant – proposed for inclusion in the SPI regulations. As in the case of requirements on recycled material content, dedicated conformity assessment procedures (as well as verification procedures for market surveillance) could be established, to allow the assessment of compliance throughout the whole upstream side of the supply chain.

Social requirements (e.g. due diligence along the supply chain) would be a novelty under the preferred option, as they are not in the scope of the current Ecodesign Directive. As for the other two previous typologies of requirements, this category entails the need of compliance assessment throughout the whole upstream side of the supply chain.

1.4. How could the transition work from existing/upcoming Ecodesign implementing measures under the preferred option in this IA?

With specific reference to this case study, but also with general validity, a dedicated procedure should be established, to be applied in the case of Ecodesign Regulations that would be already in application at the time when the preferred option in this IA would enter into force. Ecodesign Regulations are typically reviewed every 5 years (the specific time range varies case by case, and is foreseen in the ‘review clause’ article of each Regulation). For an Ecodesign Regulation that would need to be revised when the preferred option in this IA would already be in force, it could be foreseen as follows:

- The review should, first of all, focus on the topics referred to in the ‘review clause’ of the Regulation
- Secondly, the product group under review should be analysed under the broader sustainability perspective as envisaged for the preferred option in this IA, which is ‘wider’ than the current Ecodesign Directive. This would mean, in practical term, to explore the feasibility and relevance of a wider set of potential requirements applicable at product level, as indicated in Table 93 above. Obviously, coherence with the already existing Ecodesign Regulation will be sought, to ensure that none of the new provisions (as per the preferred option) would overlap with the requirements foreseen under the Ecodesign Regulation itself.
- In terms of supporting methodology to be used, please refer to Annex 16.

1.5. Impact of the preferred policy options

PO2b: Extension of the product scope of Ecodesign legislation to all physical goods

The category of smartphones is already addressed within the existing scope of the legislation. No additional impact from this option.

PO3b: Far-reaching sustainability requirements for products

As shown above in Table 93 significant durability and reliability, and reparability and upgradability requirements were already included within the preparatory study and will be part of the Ecodesign measures assessed as part of the ongoing impact assessment. Environmental and carbon footprints were also examined in the preparatory study which described possible requirements on the reduction of manufacturing impacts.

Restrictions on substances hindering circularity, minimum recycled content, requirements for high quality recycling and minimum requirements on re-manufacturability would all be, to a greater or lesser extent, additional to the existing policy measures as these are not considered in the Ecodesign and Energy Labelling IA.

Looking first at the measures included in PO3a, which are also part of the preferred option, and which are broadly equivalent to the Ecodesign and Energy Labelling measures evaluated in the impact assessment (PO5.1). We can find, that for smartphones the impacts in Table 94 are possible, these show that the measures are estimated to achieve a 24%-42% reduction in impact or costs on almost every measure, and whilst business revenues decline by a similar amount, jobs are estimated to increase by more than 12% due to increases in jobs in the repair sector.

Table 94 Selected results of Policy Option 5.1 of IA of smartphones and tablets, impacts for smartphones, feature phones and cordless phones in 2030, compared to baseline (no policy option)

| Indicator [unit] | Baseline 2030 value | Impact in 2030 PO5.1 = PO3a | Difference [%] |
|---|---------------------|-----------------------------|----------------|
| Business revenue [mEUR] | 78 000 | 58 000 | -25.6% |
| Total energy use [PJ] | 116 | 72 | -37.9% |
| GHG emissions [mtCO2e] | 7.2 | 4.2 | -41.7% |
| Material consumption [t] | 88 965 | 54 677 | -38.5% |
| External societal costs and benefits [mEUR] | 2 900 | 1 950 | -32.8% |
| Employment [jobs] | 22 600 | 25 400 | +12.4% |
| Consumer expenditure [mEUR] | 82 000 | 62 000 | -24.4% |

SPI with the additional measures in PO3b would be expected to increase the magnitude of these impacts. In the case of re-manufacturing, most manufacturers protect the spare parts through software locking which makes remanufacturing difficult. This protects against the use of spare parts from stolen smartphones but at the same time makes it difficult for repairers as they don't have access to the software. Requirements that open up spare parts accessibility would increase possibilities for re-manufacturing, although at a risk of increased use of stolen goods. In order for these requirements to deploy all their potential, it is also necessary to ensure the minimum skill level of a professional repairer. To this regard, the more recent Ecodesign Regulations (as well as the draft requirements under formulation for the Ecodesign of smartphones) foresee specific provisions on this⁵⁰¹.

⁵⁰¹ See e.g. under 'Commission Regulation (EU) 2019/2023 of 1 October 2019 laying down ecodesign requirements for household washing machines and household washer-dryers pursuant to Directive 2009/125/EC of the European Parliament and of the Council, amending Commission Regulation (EC) No 1275/2008 and repealing Commission Regulation (EU) No 1015/2010 (Text with EEA relevance.), Annex II.8.3.a:

- the manufacturers, importers or authorised representatives may require the professional repairer to demonstrate that:
- (i) the professional repairer has the technical competence to repair household washing machines and household washer-dryers and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
 - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State;

In terms of magnitude, the IA for smartphones assumed 10% of smartphones would be refurbished for PO5.1 (PO3a), if increased ease of remanufacturing were to double this rate to 20%-30% then the number of jobs created could increase significantly. Using the analysis in the IA and figures related to reparability rates⁵⁰², which are a logical proxy for remanufacturing, **then around 51 000 – 77 000 jobs could be created, or +126%-241% compared to baseline.** Whilst the % impacts are likely to be lower for the other indicators they would still be expected to increase through the additional measures, particularly for emissions and energy use, which are concentrated in the production phase of the product, and for which remanufacturing would reduce the need for.

For SMEs (EU-based) the requirements are likely to provide an opportunity, particularly to firms active in the repair and refurbishment markets. The requirements may also stimulate eco-innovation. Environmentally the impact of the preferred option, by pushing towards extended product lifetime and reducing sales would lead to a reduction in demand for new smartphones and consequently the impacts associated with materials, manufacturing and distribution, which constitute the largest part of the environmental impacts.

Due diligence requirements in the supply chain would also provide an additional area of impact, although it should be noted that significant activities in this area are already taking place, for example Apple⁵⁰³ and Samsung⁵⁰⁴ amongst others already pay significant attention to these aspects – but there remain significant gaps for other manufacturers. Improving due diligence across the smartphone sector could boost the environmental and social benefits of the policy option, but lead to higher consumer expenditure as costs are passed on.

Horizontal measures covering groups of products could potentially impact upon smartphones, but it is unclear which measures, if any, would be considered therefore these are not evaluated here.

Based on the PO3b policy option going beyond the policy option in the impact assessment on smartphones, which was estimated to reduce impacts and costs by 24-42% across various indicators, it seems reasonable to assume, **that reductions of 30-60% in energy use, emissions, material consumption and costs could be achieved by this policy option.** This would have consequent impacts on costs for manufacturers and prices for consumers, although the smartphone IA estimated that the impact of the Ecodesign and Energy Labelling measures on smartphone prices would be only around 0.8%, the additional SPI measures in terms of remanufacturing and due diligence would be unlikely to increase prices by greater than this amount again.

PO4b: Digital product passport

The Energy Label proposed in the current preparatory study includes some significant information requirements on energy efficiency, battery endurance (per cycle), battery endurance (in no. of cycles), [water] ingress protection rating, an environmental impact score (based on the updated MEErP Ecoreport tool) and a QR code to a product information sheet. This addresses some of the issues included in this policy option. The impacts of these measures are included in the totals in Table 94 above.

For SMEs and others active in the repair, refurbishment and end-of-life phases there will be some additional costs in investing in necessary hardware and software to interface with the DPP.

⁵⁰² With product legislation, we do not have ‘direct legal coverage’ of the repair operations/decisions, which will remain intrinsically linked to the customer behaviour. Appropriate realistic (and not overoptimistic) analysis, on the basis of available evidence, (and, when not available, on estimates) should be developed to this extent.

⁵⁰³ https://www.apple.com/supplier-responsibility/pdf/Apple_SR_2021_Progress_Report.pdf

⁵⁰⁴ <https://www.samsung.com/us/sustainability/sustainable-supply-chain/>

Nevertheless, it is expected that net savings will result over time as their work is facilitated by fast access to information. Reduced repair costs can be envisaged for consumers as a result.

PO5b: Linking incentives to performance

Reputational and economic incentives by Member States are unlikely to be necessary, or the highest priority use of MS resources, in the case of smartphones given the already high-level of consumer and NGO attention and the value already placed on these aspects by firms.

As functioning markets already exist for the reuse and recycling of smartphones, the case for modulating EPR fees is weaker as EPR fees based on the market share of sold phones would not very well reflect the volumes of smartphone e-waste reaching EPR waste processors. This is because old smartphones often do not reach EPR processors as phones are stored, or already recycled by other companies. It is also the case, that the business case for recycling of smartphones is already strong due to the relatively high value of the components and materials that can be recovered and recycled, so that incentives to businesses may not help much. Although they could provide additional stimulus to manufacturers to improve the environmental performance of their products, i.e. reducing product weight to reduce EPR charges, although as already noted, the market is already highly competitive.

Incentives to citizens to dispose of ‘hibernating’ phones may be more beneficial, as citizens habits are the largest obstacle for recovering old phones. The French circular economy roadmap had identified a deposit and return scheme (DRS) for smartphones to incentivise the collection, but it has not been implemented yet. This policy option by obliging action, could further incentivise MS to implement this, or other similar policy measures. These could be very impactful given that it is estimated that around 65% of all smartphones are hoarded / put into hibernation at end-of-life, a total that runs to hundreds of millions of old smartphones kept in this way. Incentives, even if these were only partially successful, could therefore still have a major impact in increasing the return of phones, increasing materials for recycling, re-use, remanufacturing and reducing environmental impacts. Based on an average phone weight of 190g⁵⁰⁵, and the incentives leading to around 20 million smartphones per year being recovered then it is **possible around 3 800t of materials could be recovered annually, or around 4.3% of estimated 2030 material consumption.** Although the benefits would not only be in material consumption, but also in boosts to 2nd hand markets, reduced emissions, etc. If a similar relationship between impacts as was shown in Table 94 was evident, then **positive impacts of 2-6% or more could be foreseen for many of the other impact categories.**

Mandatory green public procurement (GPP) of smartphones could have an important impact. The Commission recently published updated voluntary GPP criteria for computers and smartphones⁵⁰⁶. These criteria focus on product lifetime extension, energy consumption, hazardous substances, end-of-life management and criteria for refurbished/remanufactured products. This SPI policy option aims to go beyond by setting mandatory GPP criteria. It would thereby ensure a more widespread application of such criteria. It is unclear what the impact of this may be as the role of public procurement in the smartphone market is unknown, estimates from the JRC study, point to a likely public procurement share of the ICT market in the range of 5-10%, likely for a consumer good such as smartphones the ratio of private purchases will be higher. A 5% share would equate to around 6.5-8 million smartphones purchased by the public

⁵⁰⁵ Based on assumptions in Smartphones preparatory study

⁵⁰⁶ JRC (2021) Revision of the EU Green Public Procurement (GPP) Criteria for Computers and Monitors (and extension to Smartphones). Technical report v3.0

sector each year, this compares to public administration employment of approximately 13.6 million in 2019⁵⁰⁷.

The current voluntary GPP criteria address many of the points already proposed to be addressed under PO3b. Making some or all of those criteria mandatory will likely increase the purchase of phones with better environmental and social characteristics. Using the impact of the Energy Label in the IA as a proxy⁵⁰⁸, an estimate of -0.2% reduction in material use can be made, from which **a range of impact of 0.1%-0.3% reductions in environmental and social impact can be estimated**⁵⁰⁹.

PO6b: Enhanced value retention

Guidelines and a hub to support Circular Business Models (CBMs) could result in adaptations of existing business models, particularly for mobile phone service providers. Many phone contracts already have many of the characteristics required for product-as-a-service business models and to relatively easily build in re-furbishing, re-manufacturing and recycling. Current contracts designed around 18-24 month replacement cycles typically involve selling the phone to the consumer, this could evolve to a leasing model (product-as-service) where phones are returned at the end of an agreed period and a replacement provided. Whilst not ideal from the perspective of extending product (first-)lifespans it would result in many more phones being returned for refurbishment, re-manufacturing or recycling. As the sector is very fragmented (i.e. there are few direct links between manufacturers, retailers, repairs/refurbishers, PROs, etc.) circular business models could have a significant beneficial impact. This argument is being illustrated in practice in cases where retailers are acquiring repair companies⁵¹⁰, thus improving the circularity.

Data on mobile phone service contracts being smartphone inclusive is scarce, values of 50-60% of all phones have been estimated in a UK context⁵¹¹. It is unclear what an EU average would be, however using 50% as an assumption it possible to estimate the potential impact of this policy option if part of these handset inclusive contracts adopted a leasing model. If 50% of smartphones were purchased via handset inclusive mobile contracts, then approximately 65-80 million smartphones are supplied in this way each year. If 20% of this share of the market were to move to a circular business model then this is already 13-20 million smartphones that could be recovered each year for remanufacturing, re-use and recycling. At an average weight of 190g per smartphone⁵¹², **this represents a possible saving of around 2 500-3 800t of materials recovered, or around 2.8%-4.3% of estimated 2030 material consumption.** Although the benefits would not only be in material consumption, but also in boosts to 2nd hand markets, reduced emissions, etc; and with a similar relationship between impacts as in Table 94, then **positive impacts of 2-6% or more could be foreseen for the other impact categories.**; it is also particularly relevant due to high levels of hoarding of old smartphones, which these models may avoid. This could overlap with the benefits of option PO5b as both would address the hoarding issue, but in different ways.

⁵⁰⁷ Eurostat [nama_10_a64_e] Employment in NACE category O Public administration and defence, compulsory social security.

⁵⁰⁸ Often energy label categories are used as a proxy for the application of GPP criteria, with minimum energy label categories used as criteria in procurement.

⁵⁰⁹ On the basis of the values in the smartphone IA for material consumption for PO4 Energy Label only, compared to the baseline PO1, then multiplied by the 5% of the market estimated to be affected by public procurement. The range of values reflects the ranges illustrated in the previous tables.

⁵¹⁰ For example, In France a leading retailers FNAC has bought a smartphone repair company WeFix

⁵¹¹ [https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Handset%20Report_%20Full%20draft%20\(1\).pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Handset%20Report_%20Full%20draft%20(1).pdf)

⁵¹² See Smartphone preparatory study Figure 114

PO7b: Strengthen market surveillance by Member States

Given the active and ongoing process for Ecodesign and Energy Labelling measures this policy option would unlikely to be implemented in time to speed these processes. However, in the case that new measures would be introduced then this policy option could help to speed any future process, saving time and costs, and bringing forward environmental and other benefits.

Requirements under this policy option for collection of data from smartphone manufacturers and retailers regarding their sales and usage would lead to a better and refined understanding of the market and scale of environmental impact in Europe. Benefitting future research and preparatory studies. Costs relating to this dimension would be included in the costs listed under PO4b.

The impact of 3rd party assessment, monitoring and testing facilities would be expected to lead to more efficient implementation of the regulations. This could ease the burden on MS market surveillance authorities, whilst leading to a small increase in costs for the industry.

Improvements to market surveillance, notifications and sharing should lead to reductions in the number of non-compliant smartphones on the market, as these would be increasingly likely to be detected. Searches of RAPEX and ICSMS databases reveal very few reports of non-compliance for smartphones, therefore it is unclear how serious a problem there is to address, therefore the impact on non-compliance could be quite low.

However, these improvements would be welcome in a market where counterfeiting is understood to be significant, but also difficult to identify. Modelling on behalf of the European Union Intellectual Property Office (EUIPO)⁵¹³ has estimated that in 2015 approximately 14 million fewer legitimate phones (worth around €4.2 bn) were sold in the EU due to counterfeiting. Clearly the measures proposed under this option would aim to reduce this value, with even small improvements potentially benefitting the industry for hundreds of millions of euros, and protecting consumers from fraud and sub-standard, sometimes unsafe, counterfeit products. **If the measures under this option were to reduce counterfeiting volumes by 5% then by value this could be worth around €200 million or more**, based on the 2015 EUIPO estimates, values would likely now be even higher given the increase in average phone value since 2015. Increasing the effect to 70% as assumed in the main assessment would result in counterfeit products worth around €3bn being prevented.

Costs of enforcing the measures would fall on the EC and Member States, for the EC this could involve various start-up costs and ongoing enforcement costs, annual costs of €10 million per year are estimated in the SPI impact assessment, a small part of which could be apportioned to smartphones.

⁵¹³ EUIPO (2017) THE ECONOMIC COST OF IPR INFRINGEMENT IN THE SMARTPHONES SECTOR

Annex 13: Monitoring and evaluation of actual impacts

MONITORING OF THE IMPLEMENTATION OF THE SPI AND ITS SPECIFIC MEASURES

An Action Plan will be designed, allowing for a tracking of the implementation of actions and measures required against a specific timeframe. Implementation reports the European Commission should allow for an adequate monitoring of the SPI implementation.

Preparatory studies for the identification of priority products will be launched, and in collaboration with the Member States and industry, the methodologies for the measurement of the sustainability requirements beyond energy efficiency and water consumption need to be defined. For the first product-specific SPI measures, the relevant criteria for the classes of performance and related reputational and economic incentives need to be established, and the specifics of the European Digital Product Passport need to be defined – both in terms of content and technology.

Implementation reports by the European Commission should allow for an adequate monitoring of the SPI implementation.

MONITORING AND EVALUATION OF PROGRESS AND PERFORMANCE TOWARDS THE DESIRED IMPACTS

Figure 1, below, shows the main areas of **desired results and impacts** in the environmental and socio-economic spheres. At the core of the Sustainable Product Initiative is the intent to help reaching the green deal objectives of lower resource consumption and less environmental impact. It focuses on enhancing the environmental and social sustainability of the production and consumption of non-food products in the EU and aims at achieving these impacts by reducing the environmental and material footprints in the production and consumption phases, enhancing the life duration of non-food products, and reducing the creation of abiotic waste by households and economic sectors.

The diagram also shows how the actions and measures in response to the SPI specific objectives (see Section 4 Objectives: What is to be achieved?) are intended to be mutually reinforcing for the attainment of the expected results (see also the description of the preferred option in Section 7 Preferred option, above). The monitoring and evaluation framework is therefore structured around the desired results and impacts rather than identifying indicators for each specific objective separately.

Progress is monitored likely on an annual basis at the level of product group, and if considered necessary and relevant, product by product. A phased monitoring of progress for each product group separately will allow for the development of time series needed for the evaluation of the SPI independently of the evolution in scope over time.

Reporting by the Member States on the results of market surveillance, incentives and green public procurement will provide the European Commission with data on enforcement actions and compliance rates.

A **comprehensive evaluation** of the SPI would be done eight years after entry into force. This would be somewhat longer than the standard five years period, yet it needs to be considered that a meaningful evaluation requires that several implementing measures have actually been in force long enough to produce tangible results. The evaluation would build upon the results of product-specific review studies and focus on the attainment of an enhanced environmental and social sustainability of non-food products in the EU market.

The evaluation will examine whether there is a potential need to broaden the scope to include services as well, which could be done under the criterion of relevance. If such a need were identified, a follow-up impact assessment would be prepared to accompany the revision of the instrument.

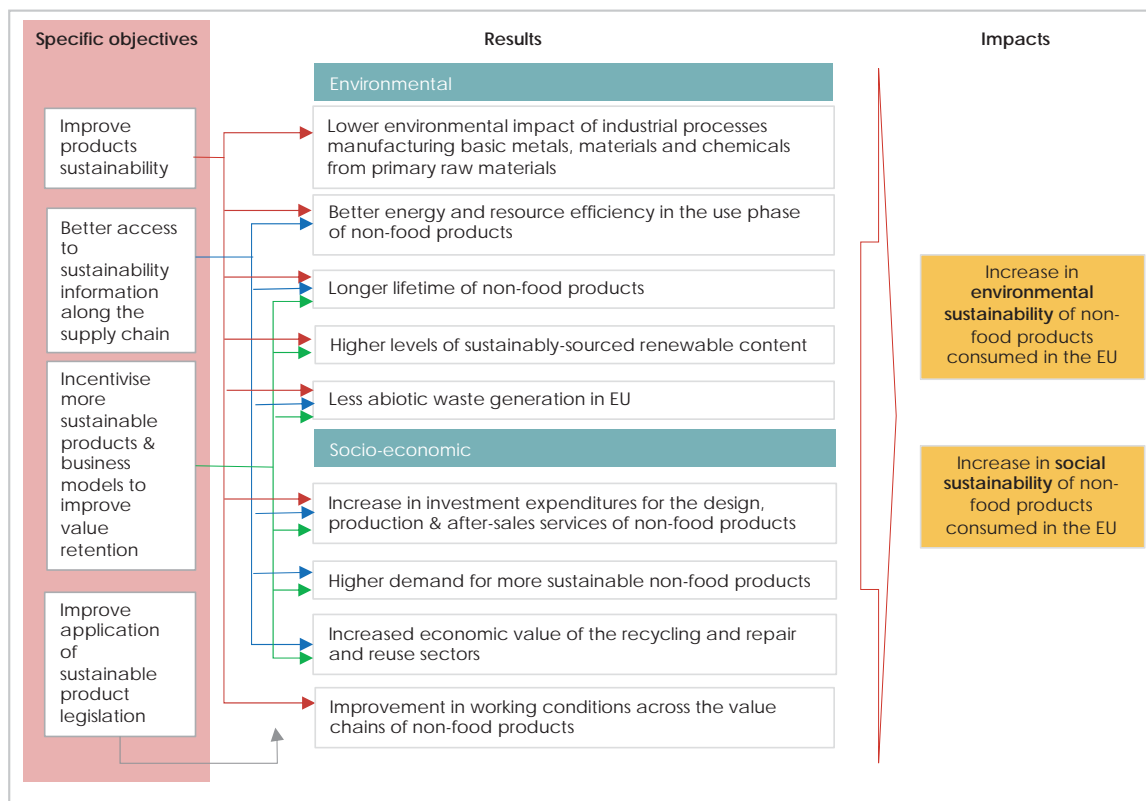


Figure 1 Main results and impacts based on the specific objectives

The **core indicators** listed in 95 and Table 96, below, are a selection of indicators and sources available for the measurement of progress towards the attainment of the desired results and impacts, respectively. The most relevant and comprehensive of these indicators have been included, following also a quality assessment in terms of frequency in publication, country coverage (in EU and beyond), relevance for the initiative (potential for filtering of sectors and products), and accuracy & transparency (availability of an explanation of the methods used to collect / analyse the data).

In most of the cases, **data** for these indicators already exist and are published from official sources, even though further development will be needed on their scope and purpose, as indicated in section 8 of the main report. Key data come from circular economy indicators, waste statistics, environmental accounting data, and business statistics. Additional data will be generated by the review studies for product-specific SPI measures.

Table 95 Core indicators for the monitoring and evaluation of progress towards desired results

| Impact area | Expected result | Definition of the indicator | Source | Frequency of measurement | Geo coverage |
|---------------|---|--|--|--------------------------|---|
| Environmental | Lower environmental impact of industrial processes manufacturing basic metals, materials and chemicals from primary raw materials | Air pollutants and Greenhouse Gas (GHG) emissions by the manufacturing value chains feeding the EU Internal Market / Air emissions accounts by NACE Rev. 2 activity (g/capita, Kg/capita, Tonne, Th Tonne) | Eurostat (ENV_AC_AIN AH_R2) | Annual | EU MS, Iceland, Norway, Switzerland, the UK, Serbia and Turkey. |
| | Better energy and resource efficiency in the use phase of non-food products | Energy efficiency of durable goods placed or put in service in the EU Internal market; Water efficiency of those durable goods using water, placed or put in service in the EU Internal market | Ecodesign Impact Accounting, VHK for the EC | Annual | EU aggregate only |
| | Longer lifetime of non-food products | Average life duration of the durable products as a consequence of (1) its intrinsic durability, (2) the maintenance, repair and upgrade operations it was subject to, and (3) the number of its successive users | To be gathered by product-specific review studies for each SPI measure | | EU |
| | Higher levels of sustainably-sourced renewable content | Contribution of post-consumer recycled materials to raw materials demand of the EU Internal Market - for non-precious metals, Critical Raw Materials, and plastics. | Eurostat (cei_srm010), JRC | Every 3 years | EU aggregate only |
| | | Circular material use rate - Share of material demand satisfied by secondary raw materials (% of total material use) | Eurostat (online data code: env_ac_cur) | Annual | Each EU MS + UK |
| | Less abiotic waste generation in EU | Volume of abiotic waste generated in the EU by manufacturing sectors and households - Generation of waste by waste category, hazardousness and NACE Rev. 2 activity | Eurostat (ENV_WASGE N) | Annual | Each EU MS + IS, LI, NO, UK, ME, MK, AL, RS, TR, BA, XK |

| | | | | | |
|----------------|--|---|--|---------------|---|
| | | Generation of waste excluding major mineral wastes per domestic material consumption (DMC) / Percentage | Eurostat (cei_pc033) | Every 2 years | Each EU MS + UK, Norway, Republic of North Macedonia, Serbia, Turkey, Bosnia and Herzegovina. |
| Socio-economic | Increase in investment expenditures for the design, production & after-sales services of non-food products | Value added and its components by activity, ISIC rev4 | OECD.Stat | Annual | 61 countries + Euro area (19) + European Union (27) + Non-OECD Economies + Former Economies |
| | Higher market share for more sustainable non-food products | Supply table at basic prices incl. transformation into purchasers' prices, filter by industries categories of final uses and imports and categories of products and gross value added components. | Eurostat (NAIO_10_CPI 5) | Annual | Each EU MS + Norway, the UK, North Macedonia, Serbia and Turkey. |
| | | Green public procurement - the share of public procurement procedures above the EU thresholds (in number and value) that include environmental elements | Eurostat Circular Economy Indicators - under development | | |
| | | Savings for consumers due to higher use-value which compensates the higher cost of products | To be gathered by product-specific review studies for each SPI measure | | EU |

| | | | | | |
|--|--|--|--|--------|--|
| | Increased economic value of the recycling and repair and reuse sectors | “Gross investment in tangible goods”, “Number of persons employed” and “Value added at factor costs” in the recycling sector and repair and reuse sector. | Eurostat (cei_cie010) | Annual | All EU MS except Czechia, Ireland, Luxembourg and Malta (confidential data), plus the United Kingdom, Norway, Iceland, Turkey, Serbia, Bosnia & Herzegovina. |
| | | N / evolution of enterprises involved in the repair of computers and personal and household goods" | Eurostat, Annual detailed enterprise statistics for services (NACE Rev. 2 H-N and S95) [SBS_NA_1A_SE_R2] | Annual | All EU MS |
| | Improvement in working conditions across the value chains of non-food products | "Share of the working time performed along the value chains of the non-food products sold on the EU Internal Market where: - At least one worker is elected as their representative; - At least one collective bargaining agreement is applicable" | ILO Statistics on collective bargaining / ILO Annual review under the follow-up to the 1998 Declaration | Annual | Global |

Table 96 Core indicators for the evaluation of attainment of the desired impacts

| Expected impact | Definition of the indicator | Source | Frequency of measurement | Geo coverage |
|---|---|---|--------------------------|---|
| Increase in environmental sustainability of products consumed in the EU | Reduced environmental impact associated with consumption sustainable products covered by Ecodesign Directive: - CO-emissions - Organic Gaseous Carbon (OGC)-emissions - Particulate Matter (PM)-emissions - Primary material content | Ecodesign Impact Accounting | Annual | |
| Increase in social sustainability of products consumed in the EU | Number of occupational fatal injuries and deaths in the Value Chains supplying the consumption of non-food products in the EU (Categories of Product to be weighted as per their share of the EU consumption budget; within each category of Products, each country to be weighed by its market share, expressed in volume, in the category of Products.) | ILO - Data on fatal injuries and deaths in the mining and the manufacturing sectors | Annual | 55 countries, including all EU 27 MS + NO + CH, the United States and Russia. |

Annex 14: Articulation with existing legislation and other initiatives

Given that the SPI will both broaden the product scope of the Ecodesign Directive as well as broaden its empowerments to new kinds of requirements, it is necessary to define in so far as possible the SPI's articulation with existing legislation applicable to the products covered as well as other initiatives linked to or relevant for the goals of SPI. The aim is to prevent duplication so as to minimise the administrative burden for economic operators and authorities.

As set out in Option 2, the approach should be that the SPI sets requirements where existing legislation does not or insufficiently addresses sustainability aspects. To further specify the approach, **two categories can be distinguished**: product-specific legislation and legislation addressing horizontal aspects.

Product specific legislation refers to legislation focussed on a specific product or well-defined product group, often regulating mainly safety aspects (e.g. on Construction Products, Batteries, Toys, Detergents, and Packaging).

It is not feasible to provide for an articulation with every existing piece of product-specific legislation at the general level of the SPI. However, prior to establishing concrete requirements at product-specific level through SPI measures, potential overlaps or conflicts with any relevant existing legislation will be assessed in detail with a view to avoid duplication of requirements and excessive burdens for economic operators. As matter of principle, the SPI will then only intervene when existing legislation does not or not sufficiently address sustainability of relevant products (see also under Option 2).

In addition, SPI product-specific requirements will be included in SPI measures and as such cannot supersede requirements set through legislative acts such as Directives or Regulations (although they can be more specific), pursuant to the hierarchy of norms. This legal principle prevents conflicts between SPI measures and legislative acts.

Legislation addressing horizontal aspects refers to legislation addressing or empowered to potentially address SPI-related horizontal aspects in relation to a broad range of products, such as the relevant REACH rules and empowerments in relation to chemical substances in products.

Where there is legislation already addressing or empowered to address specific SPI-related aspects in a more horizontal manner, there is the clear need and possibility to define the articulation with SPI at a more general level.

This Annex intends to set out the SPI's intended articulation with the most relevant instruments of product-specific legislation and horizontal legislation, focussing on:

- (ii) linked initiatives (i.e. on Green Claims, Empowering Consumers for the Green Transition and Sustainable Corporate Governance),
- (iii) other relevant emerging initiatives, and
- (iv) relevant existing instruments including potentials amendments or revisions.

1. RELATIONSHIP TO LINKED INITIATIVES: GCI, ECGT AND SCGI

Sustainable Corporate Governance Initiative (SCGI)

The SCGI aims to foster long-term, viable and responsible business models, which incorporate climate and environmental considerations and are in line with human rights. The proposal addresses two interrelated aspects of corporate governance: corporate due diligence and specific directors' duties.

As regards corporate due diligence, which is most relevant for the SPI, the SCGI intends to set a general due diligence duty, covering human rights and environmental aspects. Application of the different SCGI requirements would depend on the size of a company.

Coherence regarding due diligence

As set out in policy option 3b, the SPI intends to enable the setting of due diligence obligations related to specific social and human rights risks relevant to specific processes or materials, where the need for this is identified in relation to particular products' supply chains. As set out in more detail in the points below, this possibility would be used only if the identified risk would not be sufficiently addressed by other instruments.

1. SPI and SCGI due diligence share general aims but have distinct specific objectives and approaches:

The SCGI is a company law initiative fostering behavioural change. It aims at embedding sustainability firmly in corporate governance systems. One important component is a general due diligence obligation that applies primarily to large EU limited liability companies. It would apply throughout the companies' global operations, including all intermediary steps (i.e. not a specific product's value chain but a company's entire value chain, including all relevant product value chains).

The SPI, on the other hand, is a product policy initiative that aims to increase the sustainability of the products available on the EU market and will focus on specific products or groups of products. Its main component is the creation of a framework for setting, based on a dedicated preparatory study and impact assessment, concrete information and performance requirements for the placing on the market of specific products (i.e. minimum requirements) related to their most relevant impacts and sustainability aspects.

In that context, the SPI framework should have the possibility to set due diligence requirements in relation to specific social or human rights risks associated with specific materials, components or production processes relevant to the specific product at hand. This empowerment is intended to be used where the relevant preparatory study identifies such specific risks and finds that other instruments do not sufficiently address them. The aim is to progressively ensure that products available on the EU market are not linked to human rights violations - identified on a product-per-product basis as most relevant for products' individual supply chains.

2. Companies covered by both SPI and SCGI due diligence obligations are faced with coherent obligations and can integrate their compliance with both initiatives:

Notwithstanding these different approaches, there are likely to be companies covered by the SCG that, given their size or, possibly activities in a specific sector, are also covered by due diligence requirements under the SPI because they place on the EU market products covered by an SPI measure including such requirements. SPI will be in line with SCG due diligence steps (which are based on UN and OECD principles, see box below) and sectoral guidance to ensure coherence and to allow companies covered by both initiatives to integrate their SPI due diligence obligations into their due diligence system set up pursuant to SCG. Depending on the product and risks at hand, SPI due diligence would focus on specific steps and add more detailed instruction as appropriate.

Like other EU product-specific legal instruments containing a due diligence duty (see for example

Article 39 of the proposal for a Batteries Regulation⁵¹⁴ and the initiative on deforestation⁵¹⁵), SPI due diligence would in this case apply as a *lex specialis*, meaning that the SCGI due diligence would apply “in so far as there are no specific provisions with the same objective, nature and effect”. The SPI would provide more detailed or stringent provisions on specific due diligence steps in light of the risks at hand. As such, the SPI would allow for the simultaneous and coherent application of other horizontal SCGI provisions.

- | |
|---|
| <ul style="list-style-type: none"> (i) identification of actual or potential adverse human rights and environmental impacts in own operations, in subsidiaries and in the value chain (ii) prevention and mitigation of adverse impact in own operations, in subsidiaries and in the value chain (iii) tracking the effectiveness of measures (iv) establishment of a complaint mechanism (v) communicate how adverse impacts are addressed |
|---|

3. *SPI due diligence adds value to the SCGI by making due diligence in relation to specific social and human rights risks more product-focussed and effective:*

Apart from the coherence, the added value of due diligence requirements in relation to human rights risks set under SPI, compared to a situation where only the SCGI would apply, is that they can:

- **Make the due diligence obligation more concrete** in relation to the characteristics of the supply chain of the material or component or the process in question or introduce more stringent requirements.

On the basis of the information available at the time of writing this report, the SCGI will set a general obligation to put in place a process for due diligence in a company, map its value chains, identify the risks and mitigate them. A general due diligence obligation at company level may therefore not ensure that due diligence is performed in relation to all products of a specific kind placed on the EU market where those products are associated with a specific human rights risk.

The SPI, on the other hand, can target risks that are most important for a given product and ensure due diligence is performed for each product placed on the market. The SPI’s focus on specific risks occurring at a specific point in a product’s supply chain would allow it to provide a more detailed description of relevant risks and required actions (see examples below in *Example* section). Experience with due diligence under the EU Timber Regulation (EUTR) shows that a more precise description of due diligence can increase effectiveness by facilitating the understanding by relevant operators of the requirements that need to be met. An important finding of the ongoing Fitness Check is that improved information and guidance on due diligence for both operators and enforcement authorities is necessary to ensure compliance and a level playing field.

- Ensure that, for specific risks related to specific products, due diligence obligations apply to **all economic operators placing those products on the EU market**, whether they are covered by SCGI or not.

⁵¹⁴ COM/2020/798 final, see EUR-Lex - 52020PC0798 - EN - EUR-Lex (europa.eu).

⁵¹⁵ See *Deforestation and forest degradation – reducing the impact of products placed on the EU market* (europa.eu).

- Further **strengthen and facilitate compliance and enforcement** for the specific steps and risks covered by the SPI measure:
 - The SPI could require the involvement of independent third parties in the pre-market conformity assessment procedure, leading to third party verification of whether a company's due diligence system meets the SPI due diligence requirements (possibly involving audits and continued periodic surveillance). Relevant economic operators would be required to have available documentation demonstrating compliance with the due diligence obligations, including the results of the third-party verification.
 - In addition to the administrative enforcement regime envisaged by the SCGI, the SPI would also allow, in specific circumstances, for the prohibition or restriction of products placed on the market by economic operators not complying with their due diligence obligation set through SPI.
4. *SPI due diligence obligations will take account of the impacts on SMEs based on product-specific information and impact assessments*

An SPI measure, as it is common practice under the current Eco-design Directive, will be based on a detailed analysis of the structure of the relevant market and supply chain when formulating policy options. A dedicated impact assessment which, following the Better Regulation guidelines, includes an analysis of the impacts of the different options on SMEs, will also be performed. When deciding on whether to include due diligence requirements, the Commission thus takes account of the size of the companies they will apply to and the proportionality of the compliance costs they entail. Whether such requirements are feasible and whether the envisaged benefits (e.g. for the environment, but also for competitiveness including for SMEs) weigh up against the costs is decided on a case-by-case basis based on product-specific information and analysis. These decisions are made with input from industry (including SMEs and their representatives), NGOs and Member State experts and under the control of Parliament and Council.

The more targeted approach of the SPI also allows requirements to be adjusted to minimize administrative burden on SMEs. For example, SPI due diligence obligations could exclude specific steps, such as the establishment of a complaint mechanism, or adjust those steps to decrease the associated administrative burden, for example by simplifying the reporting step.

Where relevant, other possible mitigating measure could include:

- the delay of the date of application of specific requirements to allow more time to adapt;
- differentiation of requirements based on the number of relevant products placed on the market;
- issuing guidelines on the correct application of specific requirements;
- organizing workshops targeted at SMEs.

Example

As mentioned above, the empowerment to adopt targeted due diligence obligations under SPI would only be used where specific human rights risks are identified in relation to the supply chain of a product or group of products under consideration for the adoption of an SPI measure.

Product at times include materials that commonly stem from Conflict-Affected and High Risk Areas (CAHRAs) as defined under Regulation 2017/821 and are thus associated with a high risk of human rights violations including child labour. For example, a recent JRC study showed that 15% of the global production of fluorspar takes place in CAHRAs. This heightens the risk that refrigerators are associated with child labour.

The SCGI is expected to include the ILO Convention of the Elimination of the Worst Forms of Child

Labour as a reference for companies' overall due diligence systems, so companies should in principle take account of child labour risks. However, given the horizontal nature of SCGI due diligence requirements, the steps to be taken by companies in this regard will be identical across industry sectors.

An SPI measure, on the other hand, could add to the SCGI regime by requiring economic operators placing refrigerators on the EU market to take specific due diligence steps targeted at this particular risk.

The SPI measure could require economic operators, for example, to:

- (1) track and document the country of origin and quantities of fluorspar used and the name and address of the relevant suppliers;
- (2) take specific mitigating measures where risks of child labour involvement are identified, e.g. to immediately suspend transactions with the relevant supplier pending improvements;
- (3) Have their due diligence actions required under SPI verified by an EU notified body.

Comparison table

The table below lists and compares specific aspects of the different initiatives, showing their interaction, for reference.

Table 97 Comparison table

| Interaction SPI-SCGI | <i><u>SCGI due diligence</u></i> | <i><u>Added value of the SPI due diligence</u></i> |
|---|--|---|
| <i><u>Description of due diligence duty</u></i> | <p>Horizontal duty applicable to all sectors and to the entire value chain:</p> <ol style="list-style-type: none"> 1. Identify actual or potential adverse human rights and environmental impacts in own operations and in the value chain; 2. Prevent risk of and mitigate adverse impact in own operations and in the value chain; <p>Mitigating measures include, as appropriate:</p> <ul style="list-style-type: none"> - joint development of corrective actions with the supplier, - joining forces with other companies to exert influence on the supplier; | <p>SPI will be able to set additional or more specific due diligence obligations in relation to specific products and their supply chain. Where deemed appropriate based on analysis of the product and existing requirements, including the horizontal due diligence framework, an SPI measure would set out the due diligence steps required and the specific materials, processes, and impacts to which they apply. As such, it would allow addressing in more detail the specific risks linked to the product addressed through SPI.</p> <p>Such additional or more specific due diligence obligations could relate to specific parts of the supply chain (e.g. more stringent auditing requirements regarding the sourcing</p> |

| | | |
|------------------------|--|---|
| | <p>3. Track the effectiveness of measures;</p> <p>4. Establish internal complaint mechanism;</p> <p>5. Report on due diligence activities - covered by the Corporate Sustainability Reporting Directive.</p> | of a particular raw material). |
| <u>Impacts covered</u> | Human rights (including labour rights as set out in the ILO core conventions) and the environment | <p>SPI due diligence requirements would focus on impacts not covered by minimum requirements on the relevant products set in SPI measures. As major environmental impacts will be covered by minimum or information requirements, the requirement of due diligence will focus on social and human rights risks.</p> <p>In addition, the due diligence requirements in SPI could be linked to the supply chain of specific materials or processes.</p> |
| <u>Product groups</u> | All industry sectors are in principle covered, at least as regards the largest companies. | <p>SPI due diligence obligation would a priori apply to all economic operators placing on the market specific products in the scope of relevant SPI measures.</p> <p>SPI will be implemented by adopting SPI measures setting out relevant requirements for a specific products in the SPI scope, going from product to product based on priority criteria. Those measures will only include due diligence requirements where deemed appropriate based on a preparatory study. In the process of developing such requirements, care will be taken to ensure consistency/complementarity with potential SCG requirements on due diligence or requirements stemming</p> |

| | | |
|-------------------------------|---|--|
| | | from other instruments. |
| <u>Instrument</u> | New | Revamped Ecodesign (legal instrument to be decided) and the product-specific measures adopted under it. |
| <u>Scope</u> | Companies based in the EU and companies generating a significant turnover in the EU, precise company size to be determined. | All economic operators placing the relevant product on the EU market |
| <u>Third country coverage</u> | Companies generating a significant turnover in the EU | All third country economic operators placing products on the EU market |
| <u>Interlinkage</u> | The SCG due diligence is <i>lex generalis</i> and would apply “ <i>in so far as there are no specific provisions with the same objective, nature and effect</i> ” in the SPI instrument, see also Recital 70 of the Batteries Proposal. | Like other EU product-specific legal instruments containing a due diligence duty, the SPI due diligence regime would <i>be lex specialis</i> . SPI due diligence obligations will be in line, to the extent possible, with the rules and concepts included in other instruments. Consistency and complementarity should be ensured at product-specific level to allow companies to comply with different sets of rules and minimise administrative burden. When deciding about the need for specific product-focused due diligence requirements, the interest of not creating a proliferation of unnecessarily different regimes will be duly considered. |

Initiative on Empowering Consumers for the Green Transition Initiative (ECGT)⁵¹⁶

This legislative initiative will tackle problems identified with:

- consumer information aspects at the point of sale, in particular the fact that consumers lack reliable information for choosing more environmentally sustainable products; and
- protecting consumers against certain unfair commercial practices in relation to sustainable purchase, such as greenwashing, early obsolescence of consumer goods and non-transparent sustainability labels or digital tools.

The IA report assesses policy options building upon the existing EU horizontal consumer law framework⁹, including the improvements recently brought forward in relation to enforcement¹⁰. It will result in targeted amendments by “greening” existing consumer law (i.e. the Consumer Rights Directive and the Unfair Commercial Practices Directive).

Most important for SPI, the ECGT will include measures to (i) improve information on the durability and reparability of products at the point of sale and to (ii) provide better consumer protection against misleading practices in relation to sustainable purchases leading to early obsolescence. The ECGT was developed in close cooperation with SPI and is intended to work in full synergy with SPI’s preferred combination of options.

Coherence regarding durability and reparability information

To improve consumer access to durability and reparability information, the Empowering Consumers initiative intends to set horizontal information requirements through consumer law. In relation to reparability, it will lay down a general obligation on sellers to provide consumers, at the point of sale, with a reparability score when required by EU law, or otherwise other relevant repair information whenever this is made available by producers. This obligation will apply to an open range of goods. In relation to durability, the initiative will lay down a general obligation for sellers to inform consumers, at the point of sale, of the existence and length of a producer’s commercial guarantee of durability, whenever this is made available. This obligation will apply to an open range of goods. In addition, for energy-using goods, in cases where the producer does *not* offer a guarantee of durability of more than two years, this information should similarly be made available to consumers at point of sale. For all goods with digital elements and digital content/services, sellers will be obliged to inform consumers of the existence (or absence) of the minimum period of time during which the producer commits to providing free software updates if this period is longer than the period of the producer’s commercial guarantee or when no such guarantee exist, and unless the contract provides for the continuous supply of the digital content or digital service over a period of time.

SPI, by laying down more specific product requirements (preferred sub-options 3b and 4b), will be able to elaborate on and further complement the above general obligations, in particular in relation to the reparability and durability of products:

- For *durability*, the SPI may set requirements on what the minimum life duration of a specific product (or its components) should be or how long its spare parts should be kept available after purchase to facilitate its repair. In addition, the SPI could set information requirements on the

⁵¹⁶ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12467-Consumer-policy-strengthening-the-role-of-consumers-in-the-green-transition_en

expected durability of specific products. Therefore, the ECGT's horizontal information requirement on producer's commercial guarantee is fully complementary to SPI.

- For *reparability*, the SPI could set requirements to improve the reparability of specific products, e.g. on a product's ease of dis-assembly or the minimum availability of spare parts. In addition, the SPI could set information requirements on reparability, possibly including a reparability score. Future SPI measures may also specify how this information should be communicated in relation to the relevant product or product group, including to consumers. Where appropriate and feasible, reparability information could also be required to be included in the European Digital Product Passport. In so far as these communication rules are relevant to sellers as defined under the ECGT, the SPI would function as a *lex specialis* and could provide more demanding or precise instructions where needed in relation to specific products or product groups. If not, the ECGT provides default rules for the seller's obligations in relation to reparability information on products when made available by producers. Therefore, the ECGT's horizontal information requirement on reparability is fully complementary to SPI.

Coherence regarding misleading practices linked to early obsolescence

In relation to *misleading practices*, the initiative will provide better consumer protection against certain unfair commercial practices hindering the green transition, including early obsolescence of consumer goods. Practices defined as unfair by ECGT in this regard will include omitting to inform a consumer about the existence of a feature of a good introduced to limit its durability or the fact that a product does not allow repair in accordance with legal requirements. This is complementary to the SPI, which aims to introduce specific requirements (e.g. on durability and reparability) for products or groups of products. Non-compliance with SPI product-specific requirements is likely to be an important factor in establishing whether a company engages in unfair practices.

The ECGT will facilitate public enforcement in order to stop unfair practices and will allow the harmed consumers to claim individual remedies where such practices are deemed unfair under consumer law. Where SPI requirement play a role in establishing an unfair practice, this option will also indirectly benefit the enforcement of the SPI.

For example, under the empowering consumers for the green transition initiative, a manufacturer of a **coffee machines** would have to inform consumers about any feature of the coffee machine introduced to limit its durability. The SPI could complement this by establishing specific minimum requirements that would further postpone obsolescence, for instance, on the minimum durability or minimum availability of spare parts for **all coffee machines placed on the market**.

Green Claims Initiative (GCI)⁵¹⁷

The Green Claims initiative was announced by the European Green Deal, the Circular Economy Action Plan⁵¹⁸ and the New Consumer Agenda⁵¹⁹. It aims to ensure that environmental claims are substantiated based on reliable, comparable and verifiable information. , The initiative would apply

⁵¹⁷ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12511-Environmental-performance-of-products-&-businesses-substantiating-claims_en

⁵¹⁸ COM(2020)98 final.

⁵¹⁹ COM(2020)696 final.

horizontally to voluntary claims related to products (goods and services, including food and non-food), and organisations, in a business-to-consumer and business-to-business context. It does not cover social sustainability.

According to the outcome of the Impact Assessment, the preferred option would make it mandatory for companies to observe certain methodological requirements regarding the substantiation and the communication of their voluntary environmental claims. For claims related to specific environmental impacts, life cycle or overall environmental performance, they need to substantiate them via a PEF or OEF report (based on a PEFCRs or OEFSRs, where they exist, and based on the PEF or OEF method⁵²⁰, where no PEFCR/OEFSR is available) and respect requirements on minimum information content in their communication. The initiative will gradually introduce methodological requirements for a wider range of priority claims. Companies would remain free to decide if they make an environmental claim.

The Green Claims initiative, under the preferred option, would establish minimum information content for claims (for instance, claims will have to show only relevant impacts, provide proof of verification by accredited verifiers, and method used, so that the user of information has assurance that the information is reliable). At the same time, more and more PEFCRs/OEFSRs would be developed by industry, European standardisation organisations, Life Cycle Assessment scheme owners and the European Commission. Reliability of substantiation would be ensured by accredited verifiers, while correctness of claims would be checked by enforcement authorities in the Member States. The application of the EF methods require data and this will be ensured through an EU central database combined with a network of 3rd party databases. The Commission would also gradually formulate requirements for other priority voluntary environmental claims, developing substantiation methods, where necessary.

Coherence with SPI

The central difference between the SPI and GCI is that while the GCI seeks to ensure that voluntary environmental claims (related to goods, services or organisations) are substantiated based on reliable, comparable and verifiable information, using a standard methodology, the SPI will allow for the setting of mandatory information requirements (in relation to specific products and excluding services), including possibly on products' life-cycle environmental impacts. When SPI requirements relate to life cycle environmental impacts, the PEF approach is taken into account (see section 16 for details). Even though GCI's requirements will thus apply only to companies *voluntarily* choosing to make a green claim in relation to a product, the initiative was developed in close cooperation with SPI and is intended to work in full synergy with SPI's preferred combination of options.

Firstly, though SPI will not tackle misleading green claims directly, the information requirements it will set on products (preferred sub-option 4b) will indirectly serve to foster the GCI's aim of providing reliable information to consumers and supply chain operators on the sustainability and environmental performance of products.

Secondly, though the methodology to be employed by SPI will need to retain a certain flexibility (including to be capable of incorporating potential methodological developments over time – see

⁵²⁰ <https://ec.europa.eu/environment/eussd/smgp/>

Annex 16 for more details), the use of PEF in the context of certain SPI requirements is likely and expected to bring positive benefits. This means that a high level of methodological coherence between the two initiatives can be expected. This will notably serve to limit the costs for those companies subject to SPI requirements for which a PEF study may be required (such as those linked to classes of performances) and willing to make an environmental claim on the basis of the same PEF study. The development of other methodologies on which the claims will need to be substantiated would be developed in synergy with SPI methodology.

How will this work in practice?

Given that SPI will lay down its detailed rules via SPI measures (i.e. not in the main act), its full implementation is likely to take place gradually. The same would apply for the methodologies to be developed for other aspects than those covered currently by PEF. The requirements for companies wishing to make a green claim for a product will nevertheless apply in all of the following cases (the description below considers as a starting point the use of the PEF):

- A product within SPI scope and for which an SPI measure *has been laid down*: In this case the interplay between GCI and SPI will depend on the typology of requirements included in the SPI measure (performance and information requirements). If the SPI measure will include the provision to communicate the environmental footprint (i.e. impacts along the life-cycle) of the product according to the PEF method, then the company making a voluntary environmental claim will be able to use the same information (i.e. PEF study) to comply both with the GCI and SPI requirements. If the SPI measure will not include such a requirement, then the company making the green claim will have to substantiate it according to the rules laid down in the GCI (i.e. through a PEF study). In case a DPP is developed for this product group as part of the SPI measure, a specific “attribute” related to the availability of the PEF study results to substantiate the green claim could be included, facilitating the communication of such information by the company.
- A product within SPI scope but for which *no SPI measure has been laid down*. In this case, a company wanting to make a voluntary environmental claim will have to substantiate it according to the rules laid down in the GCI (i.e. through a PEF study).
- A product *not covered* by the SPI scope (e.g. food products). In this case the company wanting to make a voluntary environmental claim will have to substantiate it according to the rules laid down in the GCI (i.e. through a PEF study)

1. RELATIONSHIP TO OTHER EMERGING INITIATIVES

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| 1 | Proposal for a Batteries Regulation |
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| Legislative or non-legislative? | Legislative |
| Brief description | <p>The European Commission proposed a new Batteries Regulation on 10 December 2020. Article 7 and Annex II of this proposal lay down rules on the carbon footprint of electric vehicle batteries and rechargeable industrial batteries. Article 7 sets an information requirement in the form of a carbon footprint declaration, their classification into carbon footprint performance classes and ultimately, their compliance with maximum life cycle carbon footprint thresholds. The timeline for the three requirements is 1 July 2024 for the carbon footprint declaration, 1 January 2026 for the performance classes and 1 July 2027 for the maximum life cycle carbon footprint thresholds. Annex II provides essential elements on how to calculate the carbon footprint. It states that the carbon footprint calculation should be in compliance with the latest version of the European Commission Product Environmental Footprint (PEF) method and relevant Product Environmental Footprint Category Rules (PEFCRs) and reflect the international agreements and technical/scientific progress in the area of life cycle assessment. The calculation of the life cycle carbon footprint shall be based on the bill of material, the energy, and auxiliary materials used in a specific plant to produce a specific battery model. In particular, the electronic components (e.g. battery management units, safety units) and the cathode materials have to be accurately identified, as they may become the main contributor for the battery</p> <p>Based on the information collected through the carbon footprint declarations and the relative distribution of the carbon footprint performance classes of battery models placed on the market, and taking into account the scientific and technical progress in the field, the European Commission will identify maximum life cycle carbon footprint thresholds for rechargeable industrial and electric vehicle batteries.</p> |
| Interaction/synergies with SPI | <p>This is an example of product specific legislation. According to what was indicated at the beginning of this Annex above, in those cases SPI is complementary to the product specific legislation.</p> <p>Accordingly, and given the extent of the requirements foreseen in the proposed Regulation, batteries will certainly not be considered as a priority for SPI. The latter might possibly intervene at a certain point in time regulating batteries only in case there would be additional sustainability requirements that would emerge as necessary to be set as a complement of the ones already set by the Regulation.</p> |

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| 2 | Circular Electronics Initiative (CEI) |
| Legislative or | Non-legislative initiative (TBD) and legislative initiative (TBD). |

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| non-legislative? | |
| Brief description | <p>The objectives of the circular electronics initiative (CEI) are to extend the lifespan of electronic devices (starting with mobile phones, tablets and laptops) to reduce e-waste, retain rare/valuable materials, improve recycling and boost European aftermarkets. To achieve this, these devices must be designed to be durable and allow for disassembly, maintenance, repair, reuse and recycling, and consumers should have a right to repair them (including a right to software updates).</p> <p>To meet these commitments, a two-pronged approach is currently envisaged. Upstream requirements need to be in place in order to ensure these devices are repairable and durable by design. On the demand-side, the CEI aims to ensure devices cannot only technically be repaired but that consumers have easier/affordable access to repair. This will be addressed by the initiative on ‘Promoting sustainability in consumer after-sales and a new consumer right to repair’ which may apply to various product groups (initiative described below).</p> |
| Interaction with SPI | <p>The CEI, as currently envisaged, consists of a number of actions to increase the sustainability of consumer electronics. These actions include, among others, planned Ecodesign measures that will be adopted under the existing Ecodesign Framework Directive and any future revised framework instrument, namely the SPI. While the CEI focuses on a narrow set of goods, the initiatives are complementary and could produce synergies. For example, the SPI could set out new types of sustainability requirements that could be applied to electronics at a later stage, increasing their circularity.</p> <p>The actions of the CEI may be referred to in the Sustainable Product Initiative package.</p> <p>As a successor to the current Ecodesign Directive, the revised Ecodesign legislation should continue regulating electronics products, including requirements to ensure that devices are designed to be durable and allow for disassembly, maintenance, repair, reuse and recycling.</p> <p>The review of EU rules on restrictions of hazardous substances in electrical and electronic equipment and guidance to improve coherence with relevant legislation, including REACH and Ecodesign, should be prepared in full consistency with SPI envisaged provisions on possible restrictions of hazardous substances in products (see REACH and RoHS) and on the tracing of substances of concern in products (see above).</p> |
| 3 | Promoting sustainability in consumer after-sales and a new consumer right to repair |

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| Legislative | Legislative initiative (Q3 2022) |
| Brief description | <p>This initiative would encourage goods being used for a longer time, more defective goods being repaired and more second-hand goods being purchased. It would encourage consumers in an after-sales context to repair a product when it is defective. It would also encourage producers to design their goods in such a way that they last longer, would be easily repairable and to take better into consideration their use/reuse phase.</p> <p>The initiative could entail a package of targeted amendments of the Sale of Goods Directive and a new instrument on a right to repair.</p> <p>The Sale of Goods Directive could be amended for situations when consumers receive defective goods in sales transactions. Currently, according to the Directive, when sellers deliver defective goods, consumers have a choice between the repair of the defective product and the replacement with a new one during a liability period of at least two years. There are several options how to increase sustainability through targeted amendments of the SGD which will be examined in detail in the impact assessment. Among those options are the following:</p> <p>Consumers could be incentivised to opt for the more sustainable alternative of repair, for instance by restarting anew the liability period after repair.</p> <p>To further promote sustainable decisions, consumers could be stimulated to buy second-hand goods instead of new ones, for instance by aligning the liability period for second-hand goods with that of new ones.</p> <p>To encourage producers to produce goods which last longer, the liability period could be extended.</p> <p>A new instrument on a right to repair could create a consumer right to have a defective product repaired, probably by the producer, within a given period after purchase and for a reasonable cost. While the Sale of Goods Directive would continue to apply to defects which already existed at the time of delivery, the new instrument could apply to other defects, for example those due to the use of the goods or to a lack of conformity which becomes manifest after the liability period of the Directive.</p> |
| Interaction with SPI | <p>The SPI will, in relation to repair, mainly address the supply side by setting out substantial and information requirements for products placed on the market for defined product categories, for example on their reparability. This initiative could help to further address the demand side by providing incentives and tools for consumers to play their part in a more sustainable consumption by fighting the premature disposal of</p> |

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| | <p>goods before the end of their useful life. Both initiatives would be complementary and produce synergies. For example, the scope and content features of the right to repair could be linked with the Ecodesign or future SPI measures.</p> <p>As a result, more use would be made of the repair option created through supply side measures. Vice versa, the supply side measures are a prerequisite for a right to repair as only repairable goods can actually be repaired.</p> |
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| 4 | EU Strategy for Sustainable Textiles |
| Legislative or non-legislative? | Non-legislative initiative (Q3 2021). |
| Brief description | <p>The initiative aims to set in place a comprehensive framework to boost the competitiveness and resilience of the EU textile sector, addressing its environmental and social impacts. It will identify gaps and barriers for the sector and pull together upcoming initiatives that can shift the sector towards sustainability.</p> <p>To achieve this, the initiative will announce a comprehensive set of measures, which include applying the new sustainable products framework, both from the supply side (through SPI) and demand side (empowering businesses and consumers to choose, repair and reuse textiles). The initiative will provide incentives for new business models and for increased transparency in the value chains. As regards the end of life, the initiative will mobilise investment and finance to support the entry into force of the separate collection of textile waste and consider EPR schemes.</p> <p>The initiative will also launch the transformative pathway announced in the revised Industrial Strategy.</p> |
| Interaction with SPI | <p>In keeping with the preferred policy options set out in this impact assessment, the EU Strategy for Sustainable Textiles, which is due to be adopted before SPI, intends to confirm the inclusion of textiles as one of the product categories to be covered under the future SPI scope. In the context of SPI, therefore, the intention would be to develop eco-design measures to ensure that textile products are fit for circularity, free of hazardous chemicals, are repairable and include recycled materials.</p> <p>Also reflecting the preferred policy options set out in this impact assessment, the initiative intends to elaborate on the benefits of a digital product passport for textiles, which could facilitate the sharing of</p> |

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| | <p>information with consumers but most importantly ensure the traceability and transparency of textile global value chains.</p> <p>Finally, the initiative will identify incentives for circular business models to promote new consumption patterns.</p> |
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| 5 | Minimising the risk of deforestation and forest degradation associated with products placed on the EU market |
| Legislative or non-legislative? | Legislative – forthcoming (Q3 2021) |
| Brief description | <p>The objective of this initiative is to curb deforestation and forest degradation that is provoked by EU consumption and production. This, in turn, is expected to reduce EU-driven GHG emissions and global biodiversity loss. The initiative aims to minimise consumption of products coming from supply chains associated with deforestation or forest degradation – and increase EU demand for and trade in legal and ‘deforestation free’ commodities and products.</p> <p>The preferred policy option includes a mandatory due diligence system and a country benchmarking system that will categorise countries taking into account deforestation and forest degradation linked to the relevant commodities in the scope. There will be three categories of countries — low, standard and high risk. The obligations for operators and member states authorities will vary according to the level of risk of the country of production, with simplified due diligence duties for low risk and enhanced scrutiny for high risk countries.</p> <p>The intervention will also build on: 1) A deforestation-free definition, based on the FAO definition, which products need to comply with; and an additional requirement for products to be legal according to the laws of the country of production; 2) A progressive product scope, which is regularly reviewed and updated, focusing on commodities with the highest EU embodied deforestation (beef, palm oil, soy, wood, cocoa, and coffee) and related derived products.</p> |
| Interaction with SPI | <p>SPI requirements (both minimum and information requirements) which may be defined for products potentially associated with risks of deforestation or forest degradation (such as wood furniture) should be prepared in full alignment and synergy with this initiative – see also Timber Regulation below.</p> <p>Information requirements, including through the European Digital Product Passport, may lead to additional reporting requirements (for the industry) in complement to the due diligence system provided in this</p> |

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| | initiative. |
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| 6 | Simplification and digitalisation of labels on chemicals: CLP, Detergents, Fertilising Products (proposal(s) for a regulation(s)) |
| Legislative or non-legislative? | Legislative. Adoption by the Commission is foreseen for 2022 |
| Brief description | <p>This initiative concerns the labelling requirements under the Regulation on classification, labelling and packaging of substances and mixtures ('CLP Regulation'), the Detergents Regulation and the Fertilising Products Regulation.</p> <p>Given that labels are the primary means to communicate essential product information to users, including hazard and safety information and product use-instructions, clear communication is vital for the effectiveness of chemicals legislation in protecting human health and the environment. The Fitness Check of the most relevant chemicals legislation (excluding REACH) and the evaluation of the Detergents Regulation found that chemicals' labels are overloaded with information, making them difficult to read and understand, especially for consumers. This reduces the effectiveness of the communication, and could lead to an impairment of one of the legislation's aims, i.e. raising product user awareness through labelling. Following the findings of the Fitness Check and evaluation, means of simplifying and streamlining labels will be considered for the labelling requirements under the CLP and Detergents Regulation, with a particular focus on consumers.</p> <p>The evaluations also suggest that communication could be improved by using innovative digital tools for labelling (targeted) chemical product information. The current legal labelling requirements do not allow the use of digital labelling on its own, nor incentivise it as an addition to existing labelling information. At present, digital communication on product labels is done only on a voluntary basis. In order to secure effective communication for digital labelling, actions should be taken to avoid that a range of voluntary schemes lead to potential market fragmentation or systems that are incompatible with developments such as those under the Globally Harmonised System for the classification and labelling of Chemicals (GHS). Therefore, it is desirable to introduce the possibility of digital labelling based on a common framework at EU level. Means of digitalisation (alongside the physical label) will be analysed for the labelling requirements of all three afore mentioned pieces of legislation.</p> |
| Interaction with | This initiative may lead to requiring or enabling the digital provision of |

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| the SPI | <p>information on chemicals products. Similarly, the DPP would require the digital provision of information on the products to which it applies. Contrary to the SPI and DPP, the digital labelling initiative will not include sustainability criteria (i.e. it will be limited to the digital provision of information required under the relevant pieces of chemicals legislation).</p> <p>Where the DPP applies to a chemical product subject to digital labelling, synergies and interoperability will be sought to maximally profit from the communication benefits offered by digital solutions and to avoid duplication of information requirements for economic operators.</p> |
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| 7 | EU Toolbox against counterfeiting |
| Legislative or non-legislative? | To be determined |
| Brief description | <p>The EU Toolbox against counterfeiting would be to set out a coherent, effective and coordinated action against counterfeiting, both online and offline.</p> <p>The specific objectives of the initiative would be to:</p> <ul style="list-style-type: none"> – clarify roles, actions and measures to be undertaken by right holders and intermediaries, both online and offline, to fulfil their responsibilities in an approach of mutual cooperation and information sharing, – enhance cooperation between right holders, intermediaries, and national and EU public authorities, – facilitate effective and efficient information sharing between all key actors, and – promote innovation, development and use of adequate tools and new technologies to prevent and detect counterfeiting activities. |
| Interaction with the SPI | <p>Coherence between the SCGI and SPI initiatives, and in particular the European Digital Product Passport (DPP), and the EU Toolbox against counterfeiting initiative (and specific projects such as Blockathon project) should be ensured.</p> <p>The EU Toolbox against counterfeiting initiative could build on the SCGI and SPI as horizontal initiatives, and in particular the European Digital Product Passport (DPP), if they include the fight against counterfeiting in their scope.</p> <p>The EU Toolbox against counterfeiting could consist of guiding principles, good practices and tools to urge, in particular:</p> <ul style="list-style-type: none"> - right holders to conduct due diligence checks on their business partners to increase supply chain transparency; - right holders, intermediaries, and national and EU public authorities (in |

particular law enforcement authorities) to increase the **protection of supply chains from the infiltration of counterfeit goods or components**, e.g. through the use of **new technologies**, such as data mining, AI-powered image recognition and blockchain-based solutions.

For instance, the Anti-Counterfeiting Blockathon project is an **on-going pilot project** developed by the EU Intellectual Property Office (EUIPO) to design a blockchain-based infrastructure that will help **authenticate products** (use of a ‘digital twin’) and **exchange data between all actors involved in the supply chain** (involvements of law enforcement authorities and consumers are still foreseen as optional at this stage). This blockchain-based infrastructure would be integrated with (i) track and trace systems, (ii) the EUIPO IP Enforcement Portal and (iii) the EUIPO ‘IP Register on blockchain’ blockchain-based project.

1. Experience gained in the on-going pilot project Anti-Counterfeiting Blockathon project developed by the EUIPO could be useful for the elaboration of the European DPP.

2. Coherence between these projects should be ensured.

3. Interlink / interoperability between, or even inclusion of this IP enforcement –related project in the (horizontal) European DPP could also be explored (to avoid duplication of projects).

Background:

The fight against counterfeiting (and even broader the protection of intangible assets, such as intellectual property rights, reputation, and confidential information), could also be included in the scope of the SCGI as it is already part of some companies’ CSR schemes (e.g. codes of conduct, charters of ethics with suppliers, service providers, business partners, etc.).

Intellectual property crime is often complementary to other forms of criminal activity, such as money laundering, tax fraud and tax evasion, human trafficking and occasionally forced labour.

Production, transport, storage, use and destruction of counterfeit goods could be detrimental to the environment and could be included in the scope of these due diligence requirements.

See e.g. EUIPO, 2020 Status report on IPR infringement, 2020; EUIPO and Europol, IP crime and its link to other serious crimes - Focus on poly-criminality, 2020; EUIPO and Europol, IP Crime Threat Assessment 2019, 2019.

2. RELATIONSHIP TO EXISTING LEGISLATIVE INSTRUMENTS

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| 1 | Packaging and Packaging Waste Directive (PPWD) |
| Legislative or non-legislative? | Legislative, mandatory - European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste |
| Brief description | <p>The PPWD covers both packaging design and packaging waste management of all types of packaging placed on the EU market (all types of materials and all type of functions: primary, secondary and tertiary packaging). It aims to deal with the increasing impact of packaging and packaging waste on the environment and to remove barriers in the internal market caused by diverging national rules on packaging design.</p> <p>Among other things, the PPWD requires Member States to take measures aimed at the prevention of packaging waste and to meet recovery and recycling targets. It also requires them to set up packaging extended producer responsibility schemes by end of 2024 in line with the minimum requirements of Art. 8a of Directive 2008/98/EC on waste as amended in 2018.</p> <p>Most importantly for the SPI, the PPWD also includes essential requirements for the placing on the market of packaging related to the manufacturing, composition as well as reusable and recoverable nature of the packaging. It also contains measures on marking related to the main packaging materials.</p> |
| Planned revision or amendments | <p>Revision of the PPWD is currently foreseen for Q4 2021.</p> <p>The revision will have an emphasis on reinforcing the essential requirements for placing packaging on the market with a view to, among others, improving design for reuse and recycling, ensure uptake of recycled content, and making requirements clearer and more specific to strengthen enforcement. Labelling to communicate the recyclability, recycled content, reusable nature, and/or compostability/biodegradability of packaging are also being considered. Lastly, given its harmonisation objective, changing the legal instrument from a directive to a regulation will also be considered.</p> |
| Interaction with SPI | SPI will extend the scope of the Ecodesign Directive beyond energy-related products and enable the setting of appropriate minimum sustainability and/or information requirements for a wider range of products. |

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| | <p>In principle, SPI could address packaging as part of a product (e.g. include packaging requirements in an SPI measure for phones), as a product in its own right, or both. Given the existence of the sectoral packaging legislation, and its ongoing revision, it not envisaged to cover packaging as a (stand-alone) product under SPI.</p> <p>The proposed articulation is that:</p> <p>The SPI will allow for the setting, where appropriate, of requirements on the packaging of specific products covered by SPI measures (reinforcing the current Ecodesign Directive to enable this).</p> <p>The revised PPWD will set cross cutting (essential) requirements for all packaging and possibly requirements for specific packaging types.</p> <p>Coordination between SPI and PPWD drafting teams will ensure complementarity and alignment, to ensure at least the use the same wording to define the respective requirements and empowerments (e.g. using the same definition of ‘recycled content’) and making use of the same methodologies for their implementation (e.g. on measurement of recycled content).</p> <p>When drafting measures under the SPI, packaging should be considered in the design of products to ensure further sustainability gains beyond the reach of the sectoral packaging legislation. Packaging requirements under SPI could be particularly relevant where packaging is closely associated with functionalities of specific products and could lead to broader sustainability gains for the packed product as such.</p> <p>In so far as the revised PPWD will set information or labelling requirements for packaging, it needs to be ensured that any product-level information requirements set through SPI can be clearly distinguished from that information when included on a products’ packaging.</p> |
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| 2 | End-of-life vehicle Directive |
| Legislative or non-legislative? | Legislative, mandatory - Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles |
| Brief description | The ELV Directive aims to prevent and limit waste from end-of-life vehicles and their components and to improve the environmental performance of all economic operators involved in the life-cycle of vehicles. It sets clear targets for the reuse, recycling and recovery of vehicles. By an average weight per vehicle the reuse and recovery rate should be at least 95%, the re-use and recycling rate should be at least 85 |

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| | <p>%.</p> <p>The ELV Directive prohibits the use of hazardous substances when manufacturing new vehicles (especially lead, mercury, cadmium, and hexavalent chromium) except in defined exemptions when there are no adequate alternatives. The ELV Directive requires Member states to encourage design and production of new vehicles which take into full account and facilitate the dismantling, reuse and recovery, in particular the recycling, of end-of life vehicles, their components and materials and to encourage manufacturers to integrate an increasing quantity of recycled material in vehicles and other products, in order to develop the markets for recycled materials.</p> |
| <p>Planned revision or amendments</p> | <p>Revision of the ELV Directive is currently foreseen for Q4 2022. As mentioned in the inception impact assessment, the revision aims to address that the Directive is not fully adapted to the evolution of vehicle design (e.g. increased use of new materials such as plastics, electronics, critical raw materials) and to the objectives of the EU Green Deal and CEAP (e.g. facilitating re-use and recycling through eco-design, use of recycled content). In addition it addresses the situation of the large number of “missing vehicles”, which are not reported, and represent about 35% of estimated ELVs each year.</p> |
| <p>Interaction with the SPI</p> | <p>Explored options for the ELV revision that are relevant to SPI include, among others, measures on product information and design requirements on parts and materials in cars to facilitate e.g. dismantling, reuse, remanufacturing and recycling; an extension of the scope to motorcycles and trucks; and requirements on the use of recycled content.</p> <p>The proposed articulation with SPI is as follows:</p> <ul style="list-style-type: none"> ○ Given the existence of the sectoral ELV legislation, which is under revision, it not envisaged that the vehicles covered by that legislation will be a priority product group under SPI. ○ In principle, under SPI it remains possible to introduce product requirements for vehicles, if complementary to sectoral (end-of-life) vehicles legislation. Such requirements could be considered in case these are not proposed under the revision of the ELV Directive, or for vehicles not within its scope. <p>Coordination between SPI and ELV drafting teams will ensure complementarity and alignment, to ensure at least the use the same wording to define the respective requirements and empowerments (e.g. using the same definition of ‘recycled content’) and making use of the same methodologies for their implementation (e.g. on measurement of recycled content).</p> |

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| 3 | Construction Products Regulation (CPR) ⁵²¹ |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>There is a clear division of powers in the field of construction. Member States have exclusive competence for the rules on design and construction of constructions works, while the EU ensures free circulation of the construction products. Given this background, the CPR ensures free circulation by different means than most product legislation. Instead of setting harmonised substantial requirements, the focus is on creating a ‘common technical language’, i.e. to set harmonised assessment and communication methods for the performance of construction products in relation to the basic requirements for construction works.</p> <p>The common technical language ensures that reliable information is available to professionals, public authorities, and consumers, so they can compare the performance of products from different manufacturers in different countries. More specifically, it provides the basis for national public authorities to set their performance requirements on construction works.</p> <p>Free circulation of construction products is then achieved by requiring that CE-marked construction products undergo a performance assessment prescribed by the common technical language - wherever they are made available on the EU market. This does not, however, guarantee that a product bearing the CE marking can systematically be used (i.e. incorporated in construction works) in every Member State, which depends on the applicable building regulation.</p> <p>The common technical language consists of harmonised technical specifications (hTS) containing performance assessment and communication methods, currently mostly in the form of CEN (European Committee on Standardization) standards cited in the Official Journal. The use of these standards is, contrary to most product legislation, compulsory.</p> |
| Planned revision or amendments | <p>A CPR revision proposal is currently planned for Q4 2021.</p> <p>In addition to improving the implementation of the common technical language, primarily by making more efficient the standardization process, and modernizing the CPR, the revision will potentially aim to address the sustainability aspects of construction products. On two fronts:</p> |

⁵²¹ [Regulation \(EU\) No 305/2011](#) laying down harmonised conditions for the marketing of construction products.

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| | <ul style="list-style-type: none"> ○ By including the environmental performance of construction products in the common technical language; and ○ By ensuring that the CPR is able to set, where appropriate, minimum sustainability requirements for construction products. |
| <p>Interaction with SPI</p> | <p>In the case the relevant option is retained, the CPR would include empowerments to address the sustainability aspects of an important product group. Therefore, the articulation with SPI should identify which instrument is intended to set requirements to realise the aims of the SPI. These include both requirements of substance, e.g. to respect a certain limit value, and information requirements.</p> <p>1. Three fundamental principles</p> <p>Three fundamental principles guided the development of a solution on how the two instruments shall articulate:</p> <ul style="list-style-type: none"> - The situation that products are assessed under the SPI and the CPR should be avoided to the extent possible, not least to avoid double burden. But there might be situations where the two legal frameworks need to be complementary - The CPR system has the longstanding practice to balance intended requirements on construction products with construction work aspects. The SPI intends to set minimum sustainability requirements and information requirements for products, taking into account safety aspects where relevant. In so far as either instrument covers construction products, it should be noted that environmental and safety aspects of construction works are not directly regulated but should be taken into account where relevant when setting requirements on products. The CPR system is a priori better suited to do so for construction products, i.e. to identify and arbiter in a fine-tuned way the possible trade-offs between different safety and environmental aspects⁵²². - Construction products shall be subject to the same level of stringency as other products covered by the SPI. This principle will have many concrete practical consequences, see e.g. below for the empowerments needed so as to enable measures similar to and as stringent as those adopted under the SPI. The application of this principle should lead to an assessment of priority construction products for the integration of sustainability aspects, taking into |

⁵²² E.g. it can foresee, by relating to its load bearing performance classes, low minimum recycling quota for concrete intended to be used for high-rises and high minimum recycling quota for the big majority of concrete intended to be used for other purposes, thus avoiding that for safety reasons only a low minimum recycling quota can be established for all concrete.

account existing policy planning, with objectives and schedule that would serve as a basis for the benchmarking against SPI policy objectives.

2. The architecture envisaged

In view of these principles, the following architecture is envisaged:

- For construction products, the CEAP and SPI goals shall be mainly realised by means of the CPR.
- The CPR shall be able to mirror all obligations and requirements able to be set through the SPI, but for construction product. Hence, it must have extensive empowerments, both for setting environmental product requirements as foreseen in relevant policy option for the revision of the CPR and for information requirements on environmental performance. It must also be able to keep speed with the SPI in case the SPI sets up obligations for economic operators which go beyond product requirements.
- It shall aim at a high level of sustainability at product level without endangering safety or sustainability of the construction work.
- The CPR method for the assessment and communication of environmental performances shall to the extent possible follow the corresponding method used by the SPI, as many suppliers provide components or materials both to the construction products industry and to other industries.
- Where the CPR fails to deliver the same level of stringency, the SPI should be empowered to step in. This empowerment creates also an incentive for the CPR “to deliver”.

The architecture can be resumed as follows: the CPR formally operates independently, but applies the method and the regulatory features of the SPI. It is benchmarked against the SPI as the SPI can step in where the CPR does not deliver – see below for details.

3. Technical fine-tuning

A few elements of fine-tuning will be needed:

- It should be determined under which conditions the SPI should intervene where requirements established within the CPR system fall without justification below the level of stringency needed to realise the goals set for SPI, or where the objectives and schedule pursued by CPR on sustainability aspects are not met. A set of criteria and a process for joint assessment could be incorporated into the SPI or the CPR to determine under which conditions the CPR has realised in a

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| | <p>satisfactory way the goals set for the SPI.</p> <ul style="list-style-type: none"> ○ The SPI can cover intermediate products (steel, glass etc.) regardless of what happens under CPR. The only exception is cement which has no other use than construction. ○ For most of the products covered by the current Ecodesign Directive⁵²³, they would be primarily regulated by the SPI in continuation of the Ecodesign Directive, while respecting/taking into account safety aspects. The CPR would only regulate these products in a complementary way where there is a noteworthy need to do so, also taking account of other legislation on products such as on gas appliances, low voltage, and machinery. The rationale for this particular rule is that the current eco-design aspects are the dominant aspect to be regulated for these products whilst this will not change with the extension of the current Eco-Design Directive to the future SPI. <p>As the borderline between these products and ordinary construction products might not be always clear, both legal instruments shall obtain the empowerment to adopt European Commission acts determining whether a given product falls under one instrument or the other. The committees involved in the adoption of those acts under CPR and SPI shall deliberate jointly⁵²⁴.</p> <ul style="list-style-type: none"> ○ Potential loopholes or overlaps (e.g. products or components with different possible uses) will be addressed by coordination between the two systems. There are manifold situations that could in theory emerge and that cannot be anticipated other than by establishing comprehensive empowerments in both legal instruments. |
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⁵²³ This concerns in particular products and systems in the field of heating, ventilation, cooling and lighting. A detailed analysis between the involved services currently taking place might come to the result that in particular certain products formally falling under the current Eco-Design Directive, but for which no effective requirements have been set up, namely due to technical difficulties to integrate construction works' aspects, might better go into the basket of the CPR.

⁵²⁴ A merger of the two committees is unlikely to be legally possible. Conflicting decisions can, however, be avoided as the Commission has to adopt the acts, not the committees. The Committees would thus informally deliberate together, but give their opinion formally separately. The Commission will have to adopt the act(s) and arbitrate in case of diverging opinions.

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| 4 | Chemicals in products - Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) ⁵²⁵ |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>REACH, together with the Regulation on Classification, Labelling and Packaging of chemicals (CLP), is the key Union legal instrument for the assessment and management of chemical substances, as such or in mixtures and articles. REACH aims to ensure a high level of protection of human health and the environment from risks resulting from the intrinsic properties of chemical substances (mostly identified under CLP), as well as the free circulation of substances on the internal market, while enhancing competitiveness and innovation.</p> <p>REACH is organised around four processes, namely the registration, evaluation, authorisation and restriction of chemicals. Manufacturers and importers of substances are generally required to gather information on the properties of their chemical substances, which will allow their safe handling, and, for substances produced in quantities exceeding 1 tonne per year, to register this and other information in a central database. The European Chemicals Agency (ECHA) is empowered to assess the completeness and compliance of the registrations during the evaluation process. Most important for the SPI, the manufacturing, placing on the market or use of a substance (also when included in products) can be linked to information requirements in the supply chain (see section on ‘Tracking substances in products’), to an authorisation procedure, or to compliance with the conditions of a restriction.</p> <p>Authorisation applies to the placing on the market and use of substances of very high concern (e.g. carcinogenic or very-persistent-and-very-bio-accumulative substances), aiming at their progressive replacement by submitting their use to specific conditions.</p> <p>Restrictions included in REACH Annex XVII restrict the manufacturing, placing on the market and use of certain substances (varying from a complete ban to a restricted use under specific conditions), including as part of ‘articles’, the terminology used in REACH for products (e.g. ‘benzene shall not be used in toys or parts of toys where the concentration of benzene in the free state is greater than 5 mg/kg of the weight of the toy or part of toy’). Restrictions can be adopted in case of an unacceptable risk to human health or the environment (Art.68(1)), following a dedicated procedure involving the agency ECHA (Art. 69-73), or, in</p> |

⁵²⁵ https://ec.europa.eu/environment/chemicals/reach/reach_en.htm

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| | cases of specific categories of carcinogenicity, germ cell mutagenicity or reproductive toxicity (Art. 68(2)) |
| Planned revision or amendments | <p>The recently adopted Chemicals Strategy for Sustainability⁵²⁶ announces the targeted revision of the REACH Regulation (as well as the CLP and sectoral chemicals legislation), which will be limited to achieving the specific aims set out in the strategy (adoption of a proposal is currently planned for Q4 2022). Options include amongst other things:</p> <ul style="list-style-type: none"> ○ Extending the generic approach to risk management (currently in REACH Art 68(2), restrictions based on hazardousness) to other categories of substances; ○ Simplifying the authorisation procedure; ○ Strengthening enforcement. <p>It is important to note that the policy commitments in the strategy do not include any measures to broaden the scope of REACH beyond its current focus on chemical safety to include also other sustainability aspects. Therefore, the revision of REACH will not offer a basis to regulate the use of chemicals in products in order to improve their performance in relation to the aspects addressed by SPI such as durability, reparability or recyclability, if these are not (directly or indirectly) related to chemical safety.</p> |
| Interaction with the SPI | <p>REACH does not allow for the restriction of a substance for reasons other than chemical safety even if, in certain cases, restrictions can have an impact beyond safety. When assessing a particular product or product group under SPI, the restriction of a substance for which alternatives exist could lead to an improvement on sustainability aspects other than chemical safety (e.g. recyclability, high-quality recycling, upgradability, durability, reparability). That being said, REACH should remain the central instrument for restricting the manufacturing, placing on the market and use of substances.</p> <p>Therefore, the proposed articulation with REACH (as regards restrictions of chemicals in products) is that:</p> <ul style="list-style-type: none"> ○ SPI will only allow the restriction of the use of certain substances in its product-specific measures if the main reason is to improve a product's performance in relation the sustainability aspects addressed by SPI and not to improve chemical safety (although this could be a secondary effect of the restriction) and if such a |

⁵²⁶ <https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf>

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| | <p>restriction does not affect negatively human health or the environment in a significant way.</p> <ul style="list-style-type: none"> ○ Where the main reason for a restriction is to improve chemical safety, REACH (or another relevant chemical safety instrument) should be used. <p>As the current Ecodesign Directive already contains the empowerment to restrict the use of specific substances⁵²⁷, it needs to be ensured that the SPI lays down in more detail the delineation of such an empowerment with REACH (and with other relevant chemicals legislation) in order to reflect its complementary role outlined above.</p> <p>It will further be ensured that:</p> <ul style="list-style-type: none"> ○ When adopting a restrictions under SPI, its effect on chemical safety (including the chemical safety aspect of any alternative substance that will be used to replace the substance restricted under SPI) is considered with the same level of care as for a REACH restriction; ○ Where the use of a substance in a product is restricted under multiple instruments, the stricter restriction should, as a general rule, apply. |
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| 5 | Chemicals in products - Directive on the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | RoHS aims to prevent the risks posed to human health and the environment related to the management of electronic and electrical waste. It does this by restricting the use of specific hazardous substances in electronic and electrical equipment (EEE) if they can be substituted by safer alternatives. These restricted substances include certain heavy metals, flame retardants and plasticizers. It thus includes a set of restrictions for a specific sub-set of products. |

⁵²⁷ It currently lists – in its Annex I Part 3 - as a possible parameter for requirements the ‘use of substances classified as hazardous to health and/or the environment according to the CLP regulation’. This parameter can be regulated in order to improve performance in relation to the 5 environmental aspects listed in Annex I Part 1.2, which includes e.g. the use of materials, generation of waste, the possibilities for reuse, recycling and recovery of materials. Other ecodesign parameters that can have an indirect effect on the use of chemicals include the ‘avoidance of technical solutions detrimental to reuse and recycling’ and a product’s upgradability or reparability.

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| | <p>RoHS also promotes the recyclability of EEE, as EEE and its components that have become waste contain fewer hazardous substances due to its restrictions.</p> <p>RoHS empowers the European Commission to, by means of delegated acts, change or add restrictions with a view to achieving the objectives set out in Art. 1, i.e. to contribute “to the protection of human health and the environment, including the environmentally sound recovery and disposal of waste EEE.”</p> |
| Planned revision or amendments | Revision started in Q1 2021 and is planned to be finalised by Q4 2022 |
| Interaction with SPI | <p>For purposes of restrictions related primarily to chemical safety, the same articulation as between SPI and REACH should apply to RoHS.</p> <p>However, where the SPI process leads to the consideration of a potential restriction on the use of substances in EEE (i.e. whose main reason is to improve a product’s performance in relation the sustainability aspects addressed by SPI and not to improve chemical safety) and such a restriction can be defined as contributing to “the protection of human health and the environment, including the environmentally sound recovery and disposal of waste EEE”, there could be potential overlap with RoHS. This should be avoided, and therefore close coordination between the two instruments will take place to prevent overlaps.</p> |

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| 6 | Tracking chemicals in products - REACH (Art. 33) and the Waste Framework Directive (WFD, Art. 9) |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>REACH sets up a supply chain communication duty. Concretely, suppliers of articles (products and product components) containing substances in the Candidate List of Substances of Very High Concern (SVHCs) must communicate certain information to the recipients of those articles. This information must also be provided free of charge within 45 days to consumers, upon request. The Waste Framework Directive (WFD) provides for the obligation to provide that information to the European Chemicals Agency (ECA), which is tasked with the development and maintenance of a database containing this information (the SCIP database). The Agency manages the database and will have to provide access to the notified information to waste treatment operators and consumers.</p> <p>The current level of implementation of both provisions is limited and the situation is particularly worrying for imported goods and articles</p> |

placed on the market via e-commerce, where there is a general lack of information on the presence of SVHCs. In addition, the information to be provided/submitted to the Agency remains very limited and is not sufficient to ensure adequate information about the general chemical composition and safety of products. Also, products that can also be defined as substances or mixtures are not subject to this obligation, although they are subject to, e.g., labelling requirements set by CLP.

More specifically, the limitations are:

The limitations of the current provisions of **Article 33 of REACH** are described in the Commission's Staff Working Document [SWD\(2020\)247_final](#) ("Review of certain provisions of Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restrictions of Chemicals (REACH), as laid down in its Article 138"). Identified issues are a lack of awareness of duty holders, the absence of adequate information management systems in certain companies, technical difficulties derived from the complexity of articles and their chemical content, and scarcity of information on imported articles. It is noted that the situation varies depending on the nature of value chains, the company's size or the existence of stable relationships with suppliers. [SWD\(2020\)247](#) concludes:

"In view of the challenges with its implementation and the low level of compliance with Article 33, as it stands now, the benefits of any extension of its scope to cover other dangerous substances are questionable. The extension of obligation would rather result in additional challenges, adding burden on companies and not further contributing to the objectives of REACH." In other words, the simple expansion of the scope of substances covered currently under Article 33 of REACH does not seem a sufficient route to meet the commitments of the Chemicals Strategy for Sustainability and of the CEAP to address and/or provide information on a broader set of substances of concern.

One intention of the SCIP database recently introduced under **Article 9 of the Waste Framework Directive**, was to improve parts of the general implementation of REACH Article 33 to communicate information on substances of very high concern throughout the supply chain and to consumers. Another important intention was to extend the existing REACH obligation, to include now also and explicitly the waste managers. This should improve the safety of waste management practises and lead to higher quality secondary materials (less contaminated by substances of very high concern).

The SCIP database was introduced without an impact assessment and has been severely criticised by the duty holders (industry). The main concerns raised are:

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| | <ul style="list-style-type: none"> ○ the language issue (information only accepted if in English), ○ the diversity of implementation between member states (in terms of legal wording and of time required to transpose the Directive into national legislation), ○ the level of detail required because of the reference to REACH Article 33 (directly) and REACH Article 3 (indirectly, as it defines the term ‘article’), i.e. information is to be provided even at the level of the smallest component of an end-product, which is not necessarily useful for the waste managers ○ confidentiality of supply chain details. <p>Shortly after the publication of the revised Waste Framework Directive, a study on the ‘Information flows on Substances of Concern in Products from Supply Chains to Waste Operators’ was performed. The corresponding recommendations were the following:</p> <ul style="list-style-type: none"> ○ market actors should apply both generic and sectoral information flow approaches to achieve the decontamination of waste streams and the production of more secondary materials with low content of substances of concern; ○ No one-fits-all recommendation can be given on the nature of information that should be provided to the waste sector, as this depends to a large extent on the sorting processes to be supported and the specific sorting target, i.e. the degree of differentiation of output waste streams related to their content of substances of concern; ○ Authorities and stakeholders should pay more attention to the simpler information flow approaches alongside sophisticated IT-centred concepts. ○ The level of sophistication of any IT tool selected to support the flow of information on substances of concern should closely correspond to the type of information to be transferred and the level of detail necessary to support waste operators. <p>Based on these recommendations, a simple expansion of the scope of substances to be notified into the SCIP database, directly (by a change of the Waste Framework Directive) or indirectly (by a change of Article 33 of REACH), does not seem to be a sufficient, nor the most effective, tool to meet the commitments of the Chemicals Strategy for Sustainability and of the new Circular Economy Action Plan to provide information on a broader set of substances of concern.</p> |
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| <p>Interaction with SPI</p> | <p>As described in measures 4a.3 and 4b.2, the SPI will aim to overcome the limitations of the current system for specific products or product groups.</p> <p>In SPI, tracing requirements would be set at two levels by:</p> <p>Laying down substances to be tracked for groups of products (initially limited to substances for which information requirements exist already today (substances identified as SVHC under REACH), to be gradually increased if needed) - provided that measure 3b.1 enabling the adoption of SPI measures for groups of products is retained. Specifying other substances of concern, including those that are not necessarily hazardous, but affecting the broader sustainability of the product, namely recycling, reuse, remanufacturing, to be tracked in product-specific measures.</p> <p>Under measure 4b.2, this obligation would also lead to the inclusion of the relevant information in the European Digital Product Passport (EU DPP).</p> <p>The introduction of such information requirements for specific products under SPI could cover the substances for which obligations exist already in REACH and the WFD. For reasons of legislative efficiency and to remove administrative burden, it will be envisaged to progressively lift the REACH and WFD obligations for products that are SPI-compliant and accompanied by a digital product passport. This decision would be taken only when the implementation of the European digital product passport has shown to be equally or even more effective in meeting the current REACH Art 33 and WFD Art 9 objectives.</p> <p>The SCIP database under the responsibility of ECHA can also play a relevant role in reducing economic costs for operators, in particular SMEs. The means to integrate the information, currently managed under SCIP into the broader European digital product passport concept have to be further investigated and developed with the ultimate objective of avoiding duplications and additional burden to operators.</p> |
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| 7 | Chemicals as products - REACH, Chemicals Strategy for Sustainability⁵²⁸ |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>There are some products that could be addressed by the SPI that consist (mainly) of chemical substances. Examples include:</p> <ul style="list-style-type: none"> ○ Products that can be defined as ‘mixtures’ of substances under REACH and CLP, e.g. detergents; ○ Chemicals intended to be included in products (e.g. benzene); ○ Chemicals used in industrial or manufacturing processes (e.g. solvents). <p>In so far as they include hazardous substances, REACH and sectoral chemicals legislation (e.g. the Detergents Regulation⁵²⁹ and the Cosmetic Products Regulation⁵³⁰) include requirements to ensure safe use of those substances (as well as possible restrictions), which are applicable to various extents to different product categories. They are then also subject to CLP requirements, see next table.</p> |
| Planned revision or amendments | <p>The Chemicals Strategy for Sustainability announces the development and promotion of ‘safe and sustainable-by-design criteria’ (SSbD) for chemicals, materials and products. The scope and legal form of these criteria is still under consideration, but it is crucial that the sustainability criteria for the SSbD-approach are aligned, or at least compatible with, the corresponding sustainability criteria to be defined under SPI.</p> <p>In terms of information requirements, the Chemicals Strategy also announces that the Commission will assess how to best introduce information requirements under REACH on the overall environmental footprint of chemicals, including on emissions of greenhouse gases. Accordingly, the options for the targeted revision of REACH include revising the registration requirements for manufacturers and importers as regards environmental footprint information. Under REACH, substances need to be registered with ECHA, which then makes publicly available parts of the information, if they are not claimed and justified to be confidential. This requirement would thus function at the level of the substance. For a mixture, a manufacturer/importer of a substance needs to</p> |

⁵²⁸ <https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf>

⁵²⁹ Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents

⁵³⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A132025>

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| | register the individual substances of which a mixture is composed. |
| Interaction with SPI | <p>It will be ensured that any substantial requirement set through SPI for products equivalent to substances/mixtures are coherent with the future development and implementation of ‘safe and sustainable-by-design criteria’ (or even based on them), as well as the other way around.</p> <p><i>NB: a potential overlap would be the setting of restrictions on specific substances in chemical products (including mixtures). The same logic and articulation outlined above for the issue of restrictions of substances in products would apply.</i></p> <p>For information requirements set through SPI, in so far as appropriate and feasible for relevant products, the focus would be to allow for differentiation of products based on their environmental performance (as a basis for consumer choice, or for the setting of incentives). In this context, the information should therefore relate to a certain quantity of chemical product as placed on the market. In so far as REACH takes the same approach regarding the information on the environmental footprint of substances, which can be included in products consisting mainly of substances, it should be ensured it uses methodology and calculation rules coherent with the SPI.</p> <p>Lastly, the obligations for the tracking of chemical content in these products should be the same as those indicated in (see ‘Tracking chemicals in products’)</p> |

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| 8 | Chemicals as products - Regulation on Classification, Labelling and Packaging of chemicals (CLP) |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>As set out previously, there are products that could be addressed by the SPI that consist (mainly) of chemical substances.</p> <p>The CLP Regulation provides a general framework to identify the hazards of chemicals (both substances and mixtures), to inform users on the related hazards via labelling and to package those chemicals following certain requirements. The CLP hazard classification is also the basis for implementing most sectorial regulations in relation to chemicals (Cosmetics, Toys, etc.).</p> |

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| | <p>Sectoral chemicals legislation (e.g. the Detergents Regulation and the Cosmetic Products Regulation) can contain additional requirements on labelling or the provision of information.</p> |
| <p>Planned revision or amendments</p> | <p>The Chemicals Strategy for Sustainability⁵³¹ announces the introduction of new hazard classes under CLP and additional interventions to improve the current regulatory framework.</p> <p>In addition, the Labelling of mandatory information as required under the CLP legislation is currently being looked at in light of the ‘Simplification and Digitalisation’⁵³² initiative of labels on chemicals. The main objective of this initiative is to increase the effectiveness of communicating essential information on chemicals, including safety and product use-instructions, in order to further reduce the impact of harmful chemicals on health and the environment. The means of simplifying and streamlining information and introducing the use of digital tools for parts of the labels will be explored to fulfil this objective. An impact assessment will be prepared to support the preparation of this initiative and to inform the Commission's decision(s). The evidence base and impacts of a range of options will be supported by two comprehensive external studies.</p> |
| <p>Interaction with SPI</p> | <p>The proposed articulation with CLP, as regards classification and information requirements, is that SPI will only address the classification of and information requirements on products that can be defined as substances and mixtures under CLP if the main reason is to communicate a product’s performance in relation to the sustainability aspects addressed by SPI and not its chemical safety.</p> <p>Moreover, if and when SPI measures would include requirements on the packaging of the products in their scope, coherence and alignment will be sought with any relevant CLP requirements.</p> <p>Lastly, synergies could be established between the work related to the European digital products passport (EU DPP) and the developments on work related to simplifying the labelling requirements and/or providing labelling as required under the CLP regulation digitally.</p> |

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| <p>9</p> | <p>Chemicals as products -</p> |
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⁵³¹ <https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf>

⁵³² https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12992-Chemicals-simplification-and-digitalisation-of-labelling-requirements_en

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| | Sectoral chemicals legislation (Detergents, Fertilisers, Cosmetics) |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>In addition to REACH and CLP, there is a range of legislation setting requirements for the placing on the market of products that consist of chemicals. This legislation aims at ensuring the free movement of the relevant products, as well as ensuring a high level of protection of human health and the environment. They include, among other things:</p> <ul style="list-style-type: none"> ○ restrictions on substances included in the relevant products, ○ information and labelling requirements related the make-up of the relevant products and/or their safe use. |
| Planned revision or amendments | See the initiative below on “Simplification and digitalisation of labels on chemicals: CLP, Detergents, Fertilising Products”. |
| Interaction with SPI | <p>In so far as SPI measures would apply to products within the scope of the sectoral chemicals legislation, the proposed articulation is:</p> <p>In relation to restrictions, the same articulation as with REACH applies, i.e. that SPI only allows the restriction of the use of certain substances in its product-specific measures if the main reason is to improve a product’s performance in relation the relevant sustainability aspects addressed by SPI and not to improve chemical safety (although this could be a secondary effect of the restriction) and if such a restriction does not affect negatively human health or the environment in a significant way.</p> <p>In relation to information and labelling requirements, the same articulation as with CLP applies, i.e. that SPI will only address information requirements on products that can be defined as substances and mixtures under CLP (which is the case for cosmetics, detergents and fertilisers) if the main reason is to communicate a product’s performance in relation to the sustainability aspects addressed by SPI and not its chemical safety.</p> |

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| 10 | EU Taxonomy regulation and technical screening criteria⁵³³ |
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⁵³³ https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

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| Legislative or non-legislative? | Legislative, voluntary |
| Brief description | <p>Regulation (EU) 2020/852, or Taxonomy Regulation (TR), establishes unified and harmonised criteria for determining whether an economic activity qualifies as substantially contributing to environmental objectives in the EU. This is primarily to enable financial market participants to make and report on sustainable investment decisions.</p> <p>The TR is centered on six environmental objectives: climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems. Technical screening criteria are developed for each environmental objective.</p> <p>In order to qualify for inclusion in the EU Taxonomy, economic activities will need to: (a) substantially contribute to at least one of the six environmental objectives, by complying with robust and science-based technical screening criteria; (b) do no significant harm to the remaining environmental objectives; and (c) respect minimum social safeguards, and (d) comply with robust and science-based technical screening criteria that determine what substantial contribution and do no significant harm means for a given economic activity and environmental objective.</p> <p>The technical screening criteria will be developed and adopted successively: a delegated act on the two climate-related objectives has been adopted on 4th June 2021, whereas a delegated act on the remaining four environmental objectives is scheduled for end 2021.</p> |
| Interaction with the SPI | <p>The two initiatives follow different approaches. Whereas the SPI focusses on setting requirements for the placing on the market of all products in a category, the taxonomy sets criteria for the qualification of the related economic activity as environmentally sustainable. The latter is therefore a “top runner” approach, aimed at rewarding the best performers.</p> <p>However, both initiatives set out to establish agreed, unified and harmonised criteria related to sustainability. For example, in defining criteria for qualification as a substantial contribution to transition to circular economy, the taxonomy includes an “increase the durability, reparability, upgradability and reusability of products, or [...] reduce the use of resources through the design and choice of materials”, and “developing ‘product-as-a-service’ business models and circular value chains, with the aim of keeping products, components and materials at their highest utility and value for as long as possible”. Both also rely on scientific evidence and input from experts and relevant stakeholders, and reach a relatively high level of technical detail and granularity. It would</p> |

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| | <p>therefore be logical, where possible, to use common methods and metrics.</p> <p>The Taxonomy “do no significant harm” criteria would be of particular relevance, with the Regulation stating that “The technical screening criteria should identify the minimum requirements necessary to avoid significant harm to other objectives, including by building on any minimum requirements laid down pursuant to Union law. When establishing and updating the technical screening criteria, the Commission should ensure that those criteria are based on available scientific evidence, are developed by taking into account life-cycle considerations, including existing life-cycle assessments, and are updated regularly”.</p> <p>In so far as the SPI would set information requirements on products’ composition or environmental performance, coherence in the background method would not only be logical, it would also reduce the administrative burden on companies reporting towards investors under the Taxonomy Regulation, and at the same time complying with any SPI measures. The EU Digital Product Passport should facilitate access to information relating to the taxonomy.</p> <p>Article 19 of the Taxonomy Regulation on requirements for technical screening criteria lists “where appropriate, build upon Union labelling and certification schemes, Union methodologies for assessing environmental footprint, and Union statistical classification systems, and take into account any relevant existing Union legislation”. Accordingly, the proposed criteria on climate mitigation reference the Environmental Footprint methods, where relevant (e.g. where an activity is not covered by the EU Emissions Trading System (ETS) and a quantification of GHG emissions is required). Work is ongoing on the remaining four (non climate) environmental objectives, where the use of the Environmental Footprint methods is being explored. This could be a liaison point where product specific acts in SPI would reference the Environmental Footprint method as a tool.</p> <p>The first climate-related taxonomy delegated acts have been adopted, and the “Taxo4” non-climate related delegated acts will be adopted in 2022. They are likely to be complemented and updated periodically. Development of requirements for product groups under SPI implementing measures should take into account relevant existing and future technical screening criteria under the taxonomy delegated acts, including the significant harm criteria.</p> <p>In addition, technical screening criteria could where feasible be based on physical and data requirements included in SPI measures. Where such requirements distinguish the best from the worst performers (e.g. by means of performance classes), they could be potentially be used to define taxonomy criteria for the sectors involved in the manufacturing of that</p> |
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| | product or product group. |
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| 11 | Industrial Emissions Directive⁵³⁴ – E-PRTR⁵³⁵ |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | <p>The Directive 2010/75/EU on industrial emissions (IED) is the main EU instrument regulating pollutant emissions from industrial installations. IED is based on an integrated approach, use of best available techniques, inspections and public participations.</p> <p>IED obliges around 52,000 installations to operate in accordance with a permit. This permit takes into account the environmental performance of the plant covering e.g. emissions to air, water and soil, generation of waste, use of raw materials, energy and water efficiency, noise, prevention of accidents and restoration of the site upon closure and includes emission limit values.</p> <p>In addition, through the EU pollutant release and transfer register (E-PRTR) emission data reported by operators are made publicly accessible via a web-based portal, which is intended to provide this environmental information the environmental performance of on major industrial activities.</p> |
| Interaction with SPI | <p>As for the EU pollutant release and transfer register (E-PRTR): the SPI has no impact on the information provided in that context. Emission data reported by Member States are publically available through the E-PRTR at facility level. In SPI, this type of information might serve as raw data for emissions for organisations calculating environmental performance information to comply with possible requirements set through SPI. In this case, the availability of primary data will be enhanced.</p> <p>In case of specific acts that would look at the life cycle of products from industrial sectors in scope of the IED (e.g. textile; chemicals; cement; tanneries; non-ferrous and ferrous metals...), the SPI should ensure to coordinate requirements with the BAT requirements under the IED, including on pollutant emissions.</p> |

⁵³⁴ <https://ec.europa.eu/environment/industry/stationary/ied/legislation.htm>

⁵³⁵ <https://prtr.eea.europa.eu/#/home>

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| 12 | EU Ecolabel⁵³⁶ and Green Public Procurement⁵³⁷ |
| Legislative or non-legislative? | Legislative, voluntary |
| Brief description | <p>The EU Ecolabel is the European Union voluntary label for environmental excellence. Criteria for getting the EU Ecolabel are defined by product group, and aim to limit access to the label to those products (goods or services) that are best-in-class in the given product group. Criteria development usually starts from existing life cycle assessment studies to help identify the environmental aspects that need to be covered by criteria. Currently, the EU Ecolabel covers 24 product groups and 75,796 products⁵³⁸.</p> <p>Green Public Procurement (GPP) is a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured. EU GPP is currently a voluntary instrument, and Member States and public authorities can determine the extent to which they implement it. Since 2008, the Commission has developed more than 20 common GPP criteria. Please note that this existing tool is separate from the one described under measure 5a.2 on mandatory procurement requirements.</p> |
| Interaction with SPI | <p>Whereas the Ecolabel and GPP are voluntary schemes, information requirements set through SPI would be mandatory for all relevant products when placed on the market. Nevertheless, it is important to ensure coherence between SPI and the EU Ecolabel and EU GPP criteria in order to send consistent signals to the market.</p> <p>It should be ensured that the methodology linked to information requirements set through SPI, especially possible classes of performance, and the methodology used in relation to the Ecolabel and GPP criteria are coherent. In addition, EU Ecolabel and GPP criteria and SPI requirements should be prepared in close cooperation, potentially following the same background assessment method and where feasible using a common support study for both processes.</p> <p>An envisaged synergy is to where feasible provide, in the Ecolabel criteria for a product also covered by an SPI measure setting classes of performance, that the Ecolabel should be granted to products that fall within the highest performance classes (or the highest performance classes</p> |

⁵³⁶ <https://ec.europa.eu/environment/ecolabel/>

⁵³⁷ https://ec.europa.eu/environment/gpp/index_en.htm, in particular Communication (COM (2008) 400) "Public procurement for a better environment"

⁵³⁸ <https://ec.europa.eu/environment/ecolabel/facts-and-figures.html>, retrieved on 22/01/2021

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| | <p>at the time of setting EU Ecolabel criteria) and in addition fulfil the Ecolabel criteria not covered by the SPI measure and its classes of performance.</p> <p>For GPP, procurement criteria can be straightforwardly related to make reference to SPI criteria, especially if the SPI includes performance classes.</p> <p>In so far as product specific acts in SPI reference the PEF method as a tool to calculate the life-cycle impacts, three aspects would need special consideration:</p> <ul style="list-style-type: none"> ○ firstly, the EU Ecolabel does currently not use PEF as a background assessment method, although this is being tested for the on-going revision of Absorbent Hygiene Products. The CEAP also provides that “the Commission will test the integration of these [PEF and OEF] methods in the EU Ecolabel and include more systematically durability, recyclability and recycled content in the EU Ecolabel criteria”; ○ secondly, sometimes the EU Ecolabel criteria address issues (e.g. recyclability, recycled content, durability) that, whilst included in the how impacts are calculated, are not explicitly reported as impacts in PEF. In addition, they sometimes include very strict restrictions of hazardous substances able to possibly affect a products’ environmental performance as assessed under SPI; ○ thirdly, the EU Ecolabel also addresses some social issues, where relevant for the specific product group, and includes fitness for use criteria. Management system related requirements are also included in a few cases. |
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| 13 | EU Energy label² |
| Legislative or non-legislative? | Legislative, mandatory |

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| Brief description | <p>The EU Energy label is a mandatory labelling scheme for energy-using and energy-related products in the EU. It establishes a consistent and easy to understand EU wide labelling system with information on the energy efficiency of energy-related products (most prominent feature of the label with A-G scale), its energy use as well other as environmental (e.g. water use, noise) and functional parameters (e.g. washing efficiency) where relevant. The information included on the label focuses on energy efficiency and on consumption of other resources during use. The label also provides information on other functional and environmental performance of the products as long as it is based on data relating to physical product characteristics that are measurable and verifiable by market surveillance authorities. All products in scope have to be registered in a specific registry/database (EPREL) before being placed on the EU market (for improving user awareness and efficient compliance control).</p> |
| Interaction with SPI | <p>The EU Energy Label focusses on a product's energy and other resource consumption during its use, and it is limited to energy-related products. It may also provide information on other functional and environmental performance of products, relating to physical product characteristics that are measurable and verifiable by market surveillance authorities.</p> <p>In so far as the SPI sets environmental performance classes, they would not be limited to energy-related products and would relate to products' overall life-cycle environmental impacts, rather than focusing on use. There is therefore no conceptual overlap and they could be seen as complementary approaches.</p> <p>A clear articulation and differentiation of the two types of classifications will be essential in order to avoid confusion for consumers. As is currently the case between ecodesign and energy labelling, SPI and energy labelling requirements for products will need to be closely coordinated and rely on compatible methodologies.</p> |

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| 14 | Regulation (EU) No 1007/2011 on textile fibre names and related labelling and marking of the fibre composition of textile products |
| Legislative or non-legislative? | Legislative, mandatory |

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| Brief description | The textile Regulation sets mandatory information requirements concerning the composition of fibers and minimum requirements for applications for a new fiber name. Market surveillance measures are also included. |
| Interaction with SPI | Possible SPI measures for textile, in addition to minimum requirements, would also likely include product information requirements that go beyond the requirements of the Textile Regulation (e.g. presence of chemicals that would hamper recycling). Therefore the Textile Regulation would not necessarily be impacted as such by SPI measures. It could be considered, for the sake of concentrating requirements in a single legal text, to merge or combine existing information requirements with the more far reaching ones that would be set by SPI. |

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| 15 | Timber Regulation |
| Legislative or non-legislative? | Legislative, mandatory |
| Brief description | The Timber Regulation sets the obligations of operators who place timber and timber products on the market. To counter the trade in illegally harvested timber and timber products through three key obligations: 1) It prohibits the placing on the EU market for the first time of illegally harvested timber and products derived from such timber; 2) It requires EU traders (economic operators in this part of the supply chain) who place timber products on the EU market for the first time to exercise due diligence and 3) to keep records of their suppliers and customers to facilitate the traceability of timber products because, once on the market, the timber and timber products may be sold and/or transformed before they reach the final consumer. |
| Interaction with SPI | SPI would likely set minimum and information requirements concerning timber products (furniture at least). Those could probably coexist with the Timber Regulation with no need for further work in principle, although at the level of product-specific SPI measures it should be investigated if there would be room for synergies. |

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| 16 | EU Emissions Trading Scheme – main texts: Directive (EU) 2018/410; Directive 2003/87/EC; Decision (EU) 2015/1814 |
| Legislative or non-legislative? | Legislative, mandatory |

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| <p>Brief description</p> | <p>The EU ETS sets a cap on the total amount of certain greenhouse gasses that can be emitted by installations. This cap reduces over time, so that the total emissions fall. Within this cap, companies receive or buy emission allowances which they can trade with one another as needed. They can also buy a limited amount of international credits.</p> <p>The EU ETS covers the following sectors and gases:</p> <ul style="list-style-type: none"> ○ carbon dioxide from: ○ electricity and heat generation ○ energy-intensive industry sectors including oil refineries, steel works, and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals ○ commercial aviation within the European Economic Area; ○ nitrous oxide (N₂O) from production of nitric, adipic and glyoxylic acids and glyoxal; ○ perfluorocarbons (PFCs) from production of aluminium. |
| <p>Interaction with SPI</p> | <p>In order to surrender the right amount of allowances, companies have to collect and report information on their emission of the relevant substances. In SPI, this type of information might serve as raw data for emissions for organisations calculating environmental performance information to comply with possible requirements set through SPI. In this case, the availability of primary data will be enhanced.</p> <p>In case of specific acts that would look at the life cycle of products from chemicals or construction industry, the SPI should ensure to coordinate requirements on emissions with what exists in the EU ETS.</p> |

Annex 15: Evaluations of the Ecodesign/energy labelling legislation including the report of the European Court of Auditors

THE 2012 REVIEW OF THE ECODESIGN DIRECTIVE

The European Commission had to review the effectiveness of the Ecodesign Directive and its implementing measures by 2012. That review identified eight challenges for which the European Commission announced a number of non-legislative actions to improve the application of the Directive and its implementing measures⁵³⁹. The extent to which the actions announced in that review have already addressed the challenges varies as follows:

- 'Complex and lengthy preparatory procedure': the European Commission's report did not identify a specific action to address this although in fact the time to adopt measures has reduced by 7 months.
- 'Limited data to inform policy decisions': in 2013 a three-year contract was signed to develop a database on energy efficiency and other environmental aspects of energy-related products placed on the market⁵⁴⁰. However, the collection of data under the project was limited to six product categories⁵⁴¹ to keep the scope of the study manageable.
- 'Insufficient coordination of ecodesign measures with other pieces of EU legislation': a pilot project was initiated in which the European Commission's Joint Research Centre (JRC) provides technical support to the policy DGs for a number of products⁵⁴² and investigates the possibilities for a more integrated process of developing product specific policy measures. The project is on-going and should be finalised in 2015.
- 'Insufficient resources to deal with the increasing amount of regulatory, communication and standardisation work': a significant part of non-regulatory work was delegated to external bodies and experts⁵⁴³. As a result, the yearly number of ecodesign and energy labelling measures published increased to nine in 2013, against eight in 2012, two in 2011 and seven in 2010 (see *Annex 2: Stakeholder consultation*). In 2014 the number dropped to seven, but only because adoption and publication of several regulations encountered a short delay into 2015 due to the change of the European Commission.
- 'Question on the level of ambition of some requirements': the European Commission indicated it would continue reinforcing the use of the expertise of stakeholders. For the ecodesign regulations adopted in 2013 the evaluation study gives a mixed picture: the regulation for space heaters is viewed as having the correct ambition level, whereas the one for computers is seen as clearly too low while others are considered in-between⁵⁴⁴.
- 'Remaining potential to further address non-energy-related issues of energy-related products': the European Commission indicated it would continue reinforcing the use of the expertise of stakeholders. In 2013, durability and dust re-emission requirements were included in the ecodesign regulation for vacuum cleaners and nitrogen oxide emission requirements were included in ecodesign regulations for space heaters and water heaters. Noise was also

⁵³⁹ COM(2012) 765 final

⁵⁴⁰ <http://ted.europa.eu/udl?uri=TED:NOTICE:52785-2013:TEXT:EN:HTML&tabId=1>

⁵⁴¹ Tyres, vacuum cleaners, lighting, air conditioners, computers and electric motors

⁵⁴² Showers and taps, commercial refrigeration, professional refrigeration, space heaters and water heaters

⁵⁴³ EuropeDirect, EASME and New Approach consultants

⁵⁴⁴ Ecofys final technical report p.21-22

addressed for these products. Design requirements for recycling were included in the voluntary ecodesign agreement for imaging equipment. Requirements for information provision relevant for disassembly, recycling and disposal at end-of-life were included in the regulations for space heaters, water heaters and vacuum cleaners.

- 'Delays in the elaboration of suitable harmonised standards': external experts were contracted and NGOs were provided with support to allow for their active involvement. This is likely to result in standards that are better fit for purpose, but the problem of delay remains.
- 'Insufficient and ineffective market surveillance': funding opportunities for joint action on market surveillance between national authorities were provided⁵⁴⁵ and the European Commission collected data from Member States on their enforcement activities. While the data show an overall increase in market surveillance activities over the years, the level of market surveillance is still relatively low.

THE 2015 REVIEW OF THE ENERGY LABELLING DIRECTIVE (2010/30/EU) AND THE ECODESIGN DIRECTIVE

The Energy Labelling Directive requires the European Commission to review the effectiveness of the Directive and its delegated acts by 2014.

The Ecodesign Directive required the European Commission to review the effectiveness of the Directive and its implementing measures by 2012. That review concluded that no immediate revision was necessary, but that the Directive could be reviewed again along with the review of the Energy Labelling Directive, since the effects of ecodesign implementing regulations and energy labelling delegated regulations applicable to the same energy-related products are often linked and complementary. The focus was on the framework Directives and not on the individual implementing measures, which are subject to their own impact assessment process. Recognising that there are potentially other policy measures that could increase the efficiency of energy-related products, such as fiscal measures, incentive schemes, etc., the review addressed the specific problems that have arisen in the implementation of the two Directives.

The problems that are common to ecodesign and energy labelling were identified as follows. Firstly, non-compliance with ecodesign and labelling requirements, in part related to weak enforcement by national market surveillance authorities. Secondly, a number of product regulations have a low level of ambition and, thirdly, a long rulemaking process, leading to outdated technical and preparatory work at the time of policy decisions. A final problem related predominantly to ecodesign was that environmental impacts other than use-phase energy consumption could receive more attention.

The following policy options to improve the energy labelling and ecodesign framework were considered to address the problems:

1. New non-legislative action
- 1+. New non-legislative action plus legislative improvements for energy labelling
2. Significant legislative reform of both ecodesign and energy labelling
3. Comprehensive reform of ecodesign and energy labelling extending the scope to non-energy-related products and centralising market surveillance at EU level.

The three problems common to ecodesign and energy labelling were addressed by a mandatory product registration database (in option 1+ only for labelling, in options 2 and 3 for both labelling and ecodesign), providing the information needed to improve enforcement and the rule making process,

⁵⁴⁵ Under the Intelligent Energy Europe (IEE) Work Programme 2013 and Horizon 2020 call for 2014 and 2015

and to some extent addressing the problem of low levels of ambition. The alternative measure of a study collecting data (option 1; and in option 1+ for products covered by ecodesign but not by labelling) addressed the same problems although to lesser extent and not for enforcement.

Additional measures to address the problem of low levels of ambition were i) using learning curves to determine the least life cycle cost at which requirements are set (options 1, 1+ and 2) and ii) changing the least life cycle cost requirement to a significantly more ambitious 'break-even point' requirement (option 3).

Additional measures to address non-compliance and weak enforcement were supporting joint surveillance actions through EU-funded projects (options 1, 1+ and 2), legal alignment with the European Commission's proposal for a new market surveillance regulation (options 1+ and 2), streamlining legal provisions of the Energy Labelling Directive (options 1+, 2 and 3), requiring third party certification for all product groups (options 2 and 3) and centralising market surveillance at EU level (option 3).

The problem concerning other environmental impacts was addressed by extending the scope to non-energy-related products for which such impacts dominate over energy use (option 3) or, alternatively, by reviewing and updating the ecodesign analysis methodology ('MEErP') to better address material efficiency impacts of energy-related products (options 1, 1+ and 2).

The options of significant (option 2) and of comprehensive (option 3) legislative reform of both ecodesign and energy labelling would have achieved the highest energy savings. However, these options could have created disproportionate obstacles with regard to international trade, because they include third party certification for all products. Furthermore, for the extension of the scope beyond energy-related products in option 3 it was not obvious that the principle of proportionality was respected: ecodesign and energy labelling may not have been the right instruments for such products and for a number of product groups this measure would have overlapped with other environmental policies. It thus appeared to go beyond what is necessary to achieve the identified objectives.

The option of non-legislative action plus legislative improvements for energy labelling (option 1+) appears to be the optimal one from the perspective of all impacts combined.

EUROPEAN COURT OF AUDITORS SPECIAL REPORT; EU ACTION ON ECODESIGN AND ENERGY LABELLING

In this audit, the European Court of Auditors assessed whether the EU's actions on Ecodesign and Energy Labelling contributed effectively to reaching its energy efficiency and environmental objectives. They examined whether the European Commission managed the regulatory process well and adequately monitored and reported the results achieved. They also examined whether the European Commission had overseen and supported market surveillance activities effectively and whether EU-funded projects had led to sustainable improvements in market surveillance.

They concluded that EU actions contributed effectively to reaching the objectives of the Ecodesign and Energy Labelling policy, but that effectiveness was reduced by significant delays in the regulatory process and non-compliance by manufacturers and retailers.

The policy covers most of the products with the highest energy-saving potential. The European Commission used sound and transparent methodologies to decide which products to regulate, so that the policy would have maximum impact.

However, they found that the process to establish product-specific regulations is lengthy, and the European Commission could have avoided some delays. In addition, the European Commission's decision to adopt measures as a package meant that product groups that are ready to be regulated are delayed even longer. This reduced the impact of the policy, as the product design requirements do not

always reflect technological progress. Moreover, energy labels no longer always help consumers to differentiate between products.

The way the European Commission integrated circular economy concepts such as reparability and recyclability in the Ecodesign and Energy Labelling policy has been ad hoc. However, they noted that recently adopted product regulations showed that the European Commission had paid more attention to these aspects.

Every year, the European Commission reports on the results of Ecodesign and Energy Labelling policy, providing stakeholders and policy-makers with useful information. They found that the current methodology applied for the impact accounting is incomplete, as it does not take into account the impact of non-compliance with the regulations, implementation delays and the difference between real-life energy consumption and theoretical consumption.

Effective market surveillance should play a critical role in ensuring that products sold in the EU comply with Ecodesign requirements and that consumers benefit from accurate energy labels. It is the role of the Member States to check that products sold comply with the legislation. The data available shows, however, that non-compliance by manufacturers and retailers remains a significant issue.

The European Commission facilitates cooperation between Market Surveillance Authorities. The Information and Communication System on Market Surveillance, operated by the European Commission, should enable cooperation by allowing authorities to share inspection results. They found that some functional limitations in the database reduced its effectiveness. The European Commission is setting up a product database, which will, among other things, facilitate market surveillance, but this is behind schedule.

The EU-funded projects aimed at improving market surveillance have delivered results, but they have only provided a temporary solution for a recurring need.

The Court's report makes recommendations to the European Commission aimed at improving the impact of the Ecodesign and Energy Labelling policy. Their recommendations cover:

- improvements to the regulatory process to deliver more timely and impactful product-specific regulations;
- improvements in the way the impact of the policy is measured and reported;
- actions to facilitate exchange of information between Market Surveillance Authorities and improve compliance with the policy.

Improvements to the regulatory process

To improve the regulatory process, the European Commission should:

- a) define and apply a standard approach for review studies to avoid the need for additional studies;
- b) develop a standard methodological framework for including the circular economy requirements to be applied during preparatory and review studies so that their findings can be presented early in the consultation process;
- c) adopt implementing measures when they are ready, rather than when a package is complete;
- d) in particular for products based on fast-moving technologies such as ICT, more regularly assess market data so as to ensure that energy efficiency requirements and labels that are no longer relevant are swiftly updated.

Improvements on the impact accounting

The European Commission should:

- a) improve the impact accounting assumptions, notably by accounting for non-compliance, implementation delays and deviations between energy consumption based on harmonised standards and real-life usage;
- b) assess the scope for evaluating the results of the policy using sample-based methodology to measure actual energy consumption by end users with a view to improving the accuracy of the impact accounting model;
- c) quantify the policy's contribution to the 2020 energy efficiency target in the assessment report on the progress made by Member States.

Improvements to market surveillance activities and to facilitating MSAs cooperation

To improve market surveillance activities and facilitate exchange of information among MSAs, the European Commission should:

- a) deliver improvements to the ICSMS to facilitate cooperation between Market Surveillance Authorities, for example by enabling the quick identification of equivalent model numbers by cross-linking it with EPREL;
- b) upon request, provide online training to MSAs to promote the use of ICSMS to support their activities;
- c) assess the MSAs' uptake of best practice on market surveillance activities identified by EU-funded projects, including carrying-out cost-effective inspections.

Annex 16: Methodology for SPI

The objective of the methodology for the Sustainable Product Initiative (SPI) is to enable the European Commission to implement SPI, in particular to prepare and adopt measures contributing to the main objective of SPI, i.e. reduce the negative life-cycle environmental and social impacts of products and improve the functioning of the internal market. This annex presents the main steps and requirements on the methodological framework.

Four main steps are being considered:

- Prioritisation of the products
- Assessment of the products
- Definition of requirements
- Monitoring of results

The Methodology for Ecodesign for Energy-related Products (MEErP) is the methodology used so far for Ecodesign for the assessment of energy-related products and the definition of requirements. Please see Annex 6 for a more complete description of the methodology.

For SPI, there is a need to set up a new methodology that complements and integrates MEErP and its ongoing revision, in particular, to ensure that impacts along the products life cycle and other related aspects (circularity, social impacts, etc.) are correctly assessed, while keeping the flexibility needed to address a large variety of products. The methodology should include a decision tree on the prioritisation and assessment methods to be applied, distinguishing in particular energy-related products already covered by an Ecodesign measure or included in the Ecodesign and Energy Labelling Working Plans⁵⁴⁶, or other energy-related products for which energy consumption in the use stage is dominant. For these products, a simplified life cycle assessment may be used in accordance with the MEErP and its revision. By default, following Commission Recommendation 179/2013/EU on the assessment of environmental impacts along the life cycle of products, the Product Environmental Footprint method (PEF)⁵⁴⁷ shall be the recommended method. The different assessment methods should continue to evolve and converge progressively.

This annex gives the main elements on the methodology to be implemented but this is still work in progress in parallel to the work on the legal drafting and to interinstitutional discussions. The methodology and the incorporated methods will have to be ready when the revised legislation enters into force.

Given the above, the SPI legislative framework/legal text should ensure consistency, robustness and flexibility at the same time, so that future methodological developments may be incorporated and used in SPI measures where deemed appropriate.

⁵⁴⁶ 2016-2019 Ecodesign and Energy Labelling Working Plan, and 2022-2024 Ecodesign and Energy Labelling Working Plan.

⁵⁴⁷ Product Environmental Footprint (PEF) is a method developed by the European Commission and adopted in the Commission Recommendation (2013/179/EU) of 9 April 2013 on the use of common methods to measure and communicate the life cycle environmental performance of products. The Recommendation is expected to be updated in December 2021.

INTRODUCTION

The SPI methodology will have to provide:

- a way to **prioritise products** for the development of specific requirements in SPI measures;
- a way to **assess the products** and collect all the information and data needed to decide on possible requirements;
- a way to **define requirements** and any test standard, measurement method or certification needed to enable effective implementation and enforcement;
- a way to **monitor results** of SPI measures and of the legislative framework as a whole, with a view to enable the evaluation of its effectiveness, cost-efficiency and relevance.

The SPI methodology will provide a decision tree and criteria guiding the prioritisation and assessment steps, differentiating between:

- energy-related products already covered by an Ecodesign measure or included in the Ecodesign and Energy Labelling Working Plans⁵⁴⁸ or other energy-related products for which energy consumption in the use stage is dominant; the MEErP and its revision may be used; possible exceptions concerning products for which the energy consumption in the use phase is not dominant, will be evaluated when drafting the working plan;
- Other energy-related products, for which criteria should be developed to choose the appropriate assessment method;
- Other products in SPI scope, for which an environmental LCA based on PEF, should be used.

Under the current Ecodesign Directive framework, which addresses the environmental impacts of energy-related products, the overall workflow is similar:

- Working Plan
- Preparatory Studies (based on the Methodology for Ecodesign for Energy-related Products, MEErP)
- Impact Assessments / Draft Regulation
- Ecodesign Impact Accounting

It should be noted that MEErP is currently under revision in order to better integrate non-energy environmental impacts and circularity aspects (following also the work related to the revision of the Energy Labelling Directive and Ecodesign Directive in 2015). The ongoing work is considering to incorporate some parts from the PEF method to enhance its Life Cycle Assessment (LCA), in particular:

- the life cycle inventory (LCI) datasets (i.e. datasets representing average inputs and outputs, including emissions, of processes run with a specific technology in a specific geographical location);
- the Circular Footprint Formula;
- where relevant, 16 impact categories, complemented by energy consumption, CRM indicators and biodiversity.

⁵⁴⁸ 2016-2019 Ecodesign and Energy Labelling Working Plan, and 2022-2024 Ecodesign and Energy Labelling Working Plan

The SPI framework will cover:

- **product scope:** all physical goods except food and feedstuff (incl. also intermediate products)⁵⁴⁹;
- **scope of impacts:** mostly environmental sustainability, some social sustainability aspects as a safety net, and taking into account economic considerations;
- **width of the impacts:** the full life cycle along the entire value chain, from extraction of raw materials to recycling/final disposal.

The possible approach for each of the steps of the SPI methodology is:

PRIORITISATION OF PRODUCTS (STEP 1)

A prioritisation exercise will need to be conducted to identify the order in which the products under its scope should be regulated by SPI measures. The process could be based on the one carried out for the elaboration of the Ecodesign Working Plan:

- Prioritisation of energy-related products already covered by an Ecodesign measure for which a review is legally required;
- Screening and identification of a first list of products and horizontal initiatives;
- Analyses of selected products and horizontal initiatives;
- Proposal for a Working Plan.

Stakeholders would be involved at each step of the process.

The following aspects should be considered in particular when prioritising:

- contribution to meeting existing environmental, climate and energy targets, including the thematic priority objectives of the 8th Environmental Action Programme, EU international commitments and to closing gaps in EU environmental and climate policy and law;
- the economic weight of the product (the product shall represent a significant volume of sales and trade);
- the total of the environmental impacts of the products versus planetary boundaries (considering the quantities placed on the market and/or put into service, and therefore the total environmental impacts at consumption level) based on relevant MEER studies, PEFCRs or PEF studies;
- energy consumption; energy cannot be limited to its environmental impacts: security of supply and cost (for end-users) are other aspects that need to be taken into account;
- circularity aspects like durability, reusability, reparability, recyclability (if/where they are not fully reflected in the environmental impacts);
- the potential for improvement in terms of its environmental impacts, energy efficiency and circularity aspects (if/where they are not fully reflected in the environmental impacts) without entailing excessive costs (notion of affordability);
- significant social impacts along its value chain (mainly related to specific raw materials or specific processes)⁵⁵⁰;

⁵⁴⁹ Sub-option 2a 'Extension to a limited number of priority products' proposes to extend the scope of the current Ecodesign Directive to enable the adoption of SPI measures for the following range of products: Energy-related products (including electronics and ICT, means of transport); Textiles; Furniture, High impact intermediary products; Chemicals. Under sub-option 2b 'Extension to all physical goods', all products placed on the market can, in principle, be eventually subject to SPI measures.

⁵⁵⁰ See sectorial guidance documents in preparation for the Sustainable Corporate Governance initiative

- appropriate scale or grouping of products for which requirements may be defined (considering for example the possibility of horizontal requirements, of public procurement, of requirements on intermediate or final products);
- political priority in terms of strategical relevance for the EU (e.g. policy documents such as CEAP, SOTEU, Green Deal Communication, various other strategies);
- economic benefits expected from the product improvement;
- EU added value, by producing results beyond what would have been achieved by Member States acting alone.

As the detailed product assessment will be done in Step 2 (see below), some of the aforementioned aspects will be assessed qualitatively.

The final result is a work programme or an equivalent guidance document that includes an identification of which branch of Step 2 will be followed for each product group identified therein.

ASSESSMENT OF PRODUCTS (STEP 2)

The objective of this step is to provide all the information necessary on the product to define appropriate requirements.

For the assessment of energy-related products already covered by an Ecodesign measure or included in the Ecodesign and Energy Labelling Working Plans⁵⁵¹ or other energy-related products for which energy consumption in the use stage is dominant the MEErP and its revision will be used.

⁵⁵¹ 2016-2019 Ecodesign and Energy Labelling Working Plan, and 2022-2024 Ecodesign and Energy Labelling Working Plan

The below figure provides an indicative overview of the approach for this step for other products, based on the steps of the MEErP.⁵⁵²

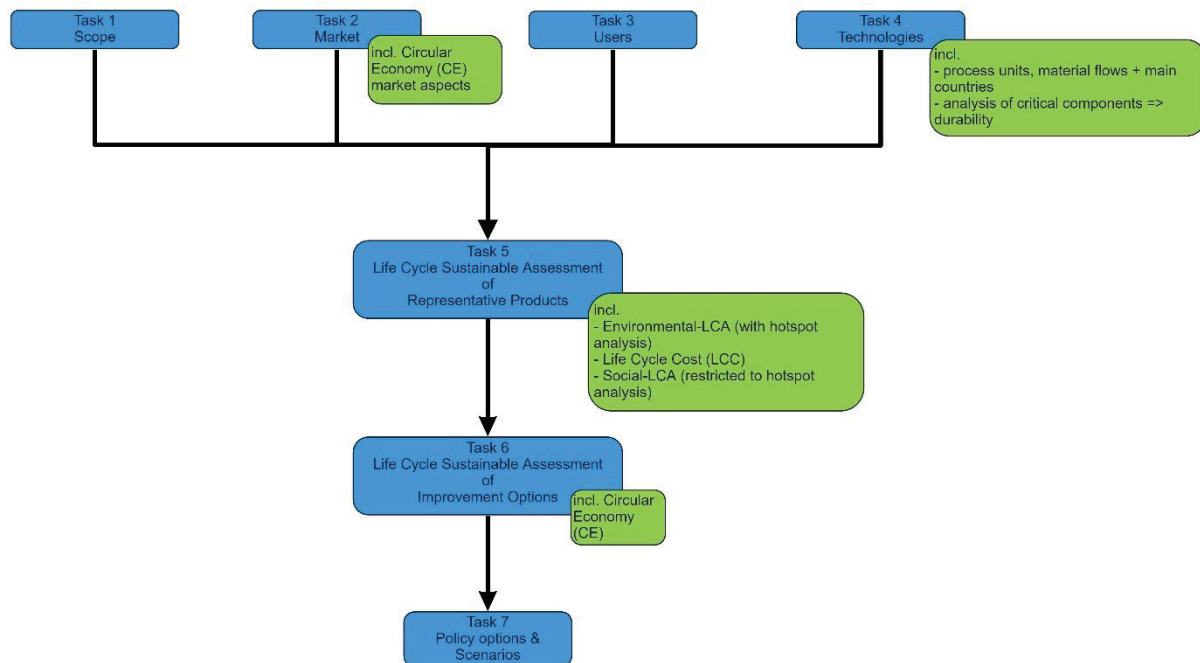


Figure 1 (Indicative) overview of the SPI methodology for the "Assessment of products" showing the main differences to the existing MEErP⁵⁵³

As the SPI methodology is based on the well-proven MEErP, it consists of the same 7 tasks (see blue boxes). However, the SPI methodology will include changes, the major changes are (see green boxes):

- Task 2 (Market) will cover Circular Economy market aspects;
- Task 4 (Technologies) will include 1) a description of the process units and material flows with information regarding the countries and 2) an analysis of critical components to assess the durability of the product;
- the environmental LCA (E-LCA) and Life Cycle Costing (LCC) analyses of the representative products will be enhanced by a social LCA (S-LCA)⁵⁵⁴, so that an assessment of the Life Cycle Sustainability impacts would be carried out in Task 5 and Task 6. The E-LCA would be in line with the PEF method.
- Task 6 will take better and more systematically into account the Circular economy aspects.

⁵⁵² MEErP includes following tasks: Task 1: Scope, Task 2: Market, Task 3: Users, Task 4: Technology, Task 5 LCA and LCC of Bases Case, Task 6: Design Options and Task 7: Scenarios.

⁵⁵³ For example the MEErP revision plans to include a more systematic inclusion of material efficiency aspects and of environmental footprint/ecological profile aspects in the design options and in the LLCC curve.

⁵⁵⁴ Even if the S-LCA would be restricted to a hotspot analysis, due to the lack of data in this field

The key modules for the product assessment are the one dedicated to the **Life Cycle Sustainability Impact** and the one dedicated to the **ranking** of the improvement options.

For assessment of environmental aspects, it is crucial to:

- **assess the impact of the representative products** (Base Cases)
The “representative product” may or may not be a real product that one can buy on the EU market. Especially when the market is made up of different technologies, the “representative product” can be a virtual (non-existing) product built, for example, from the average EU sales-weighted characteristics of all technologies around. Step 2 may include more than one representative product if appropriate.
- **identify the hotspots**
The major environmental impacts and stages of the life cycle as well as the processes where these impacts occur should be analysed, based on the PEF as far as possible. If, for example, a Product Environmental Footprint Category Rule is available and conforms to all aspects defined in the goal and scope definition phases, or if it can be developed for this purpose, this should be used for this analysis and provide consistency with other policies using PEF as assessment method (for instance, the Green Claims Initiative).
For the aspects that PEF would not be able to cover, other complementary approaches would be necessary, e.g. to identify circularity or social hotspots.
This step may also be referred to as “hotspot” analysis. Contributing elements may be specific life-cycle stages, processes, or individual material/energy inputs/outputs associated with a given stage or process in the product supply chain.
- **identify and assess the impacts of improvement options**
Based on the hotspot analysis and on the distribution of performance of products on the market, possible improvement options are identified, including BATs and BNATs where appropriate.
- **do a ranking of the improvement options** in order to assess later the appropriate level of requirements.

In the MEErP, the improvement potential is analysed according to the Life Cycle Costs (LCC)⁵⁵⁵ and the Environmental Impact of products (incl. Design Options).

When the use phase is not dominant in the product environmental impacts, improvement options might not lead to a LCC reduction (e.g. through energy costs savings); the LCC should then be assessed from the end-user but also the societal perspective, meaning that external environmental costs would be taken into account.⁵⁵⁶

Carrying out 1) the LCA with the PEF method, 2) complementary assessments on environmental and circularity aspects not covered by PEF, on social aspects and 3) the economic assessment including with a Life Cycle Cost method⁵⁵⁷ would deliver the main information for the analysis. This work should be carried out for Base Cases and then for the Base Cases in combination with identified improvement options. The LCC analysis should be carried out from both perspective: the end-user one and the societal perspective, which includes the costs related to environmental impacts (externalities). The improvement options would include a broad range of possibilities aiming at covering all major aspects identified in the assessment.

⁵⁵⁵ The LCC is a tool to guarantee affordability for the end-user.

⁵⁵⁶ The manufacturer perspective would be also required to assess the impact on them.

⁵⁵⁷ including purchase price and in operation / in use cost, and disposal costs (when applicable)

Furthermore, it should be noted that when the environmental analysis follows a PEF Category Rules (PEFCR), when available, then PEF studies performed in compliance with a PEFCR provide comparable results for products of the same category.

Social aspects

There are several research and international projects on social indicators on the life cycle of products and due diligence on supply chains.

Given that SPI will not need to be in a position to fully address the *social* dimensions of product sustainability, but only to take human rights risks into account in a ‘safety net’ approach, an appropriate methodological approach in the overall product assessment and in the ranking of the Improvement Options – as well as for identifying and addressing the required underlying information and data – will need to be set in place.

In relation to methodological considerations underpinning potential SPI *due diligence* requirements on the supply chain of products (see sub-option 3b): it is important to note that, given the *lex specialis* role that SPI is intended to fulfil in this area in relation to the initiative on **Sustainable Corporate Governance** (see Annex 14), the future methodological approach here will need to be closely aligned with that of the latter initiative.

Taking this into account, such an approach is likely to include the following features:

- **Establishment of *specific conditions* to be met in order to allow SPI action to be taken:** the *lex specialis* role of SPI means that it will only be able to act in cases where the initiative on Sustainable Corporate Governance cannot do so, for example, to address social impacts relating to *specific product groups* (e.g. linked to the materials or components used in them, or to their production processes). Clear conditions allowing for SPI action will be needed.

These may include:

- o The existence of real or potential adverse human rights impacts associated with *pre-defined categories of risk*, e.g. forced labour, child labour and occupational health and safety risks;
 - o Sufficiently *reliable and publicly available information* – such as independent reports – about those adverse impacts and their significance;
 - o The *absence of other EU law, international instruments or voluntary agreements* capable of sufficiently and effectively addressing these risks.
- **Alignment of rules with internationally recognised principles:** Where relevant conditions are met, SPI should be able to set supply chain due diligence requirements on products. To ensure alignment with the initiative on Sustainable Corporate Governance, as well as enforceability, it will be important to align these rules with a core set of internationally recognised principles. These may include: the Ten Principles of the United Nations Global Compact⁵⁵⁸, the ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy⁵⁵⁹, and the OECD Due Diligence Guidance for Responsible Business Conduct (RBC)⁵⁶⁰.

⁵⁵⁸ The Ten Principles of the UN Global Compact, available at <https://www.unglobalcompact.org/what-is-gc/mission/principles>

⁵⁵⁹ Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy, available at https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---multi/documents/publication/wcms_094386.pdf

⁵⁶⁰ OECD (2018), OECD Due Diligence Guidance for Responsible Business Conduct, available at <http://mneguidelines.oecd.org/OECD-Due-Diligence-Guidance-for-Responsible-Business-Conduct.pdf>

- (Where conditions for SPI action have been met) **Setting supply chain due diligence rules:** These rules will again need to be closely aligned with those of the initiative on Sustainable Corporate Governance, and will likely require products placed on the market to be accompanied by documentation showing that steps have been taken to address the risks previously identified. Such steps could include: in-depth risk assessment processes (e.g. linked to raw material extraction, and taking into account supplier activities); adopting and implementing risk mitigation measures; monitoring and tracking measures etc.

Regarding potential SPI *information* requirements on a set of social indicators (see sub-option 4a): these could be based on social life-cycle assessment (S-LCA) frameworks (including impact categories such as "child labour"), which have been elaborated and could be used as a starting point, with a view to identifying hotspots (i.e. points along the value-chain that may have significant positive or negative social impacts). The specific set of social indicators would be established within the product specific SPI measures, in close coordination with relevant existing legislation (see Annex 14).

DEFINITION OF REQUIREMENTS (STEP 3)

Step 3 corresponds to the part of methodology aimed at preparing SPI measures. Based on the analysis carried out previously, the following types of requirements, which can be combined, could be set as appropriate, and supplemented by others, where necessary (this list is not exhaustive):

- **Performance requirements on:**
 - durability or reliability of the product or its components
 - reparability and upgradability
 - reusability
 - re-manufacturability
 - establishing a threshold for the presence of substances hindering circularity
 - recycled content of the product or its components
 - the reduction of carbon footprint and other environmental impacts set for a given life cycle stage or for the whole life cycle
 - recyclability of the product, to produce high-quality secondary materials
 - due diligence on the supply chain of products
 - energy consumption and energy efficiency
- **Information requirements:**

Information requirements on the environmental impacts along the life-cycle of the product, for example in the form of an Ecological profile⁵⁶¹. Social performance of the product could be also provided taking for example the form of a set of social indicators⁵⁶². Other information requirements, including those currently provided in the Ecodesign directive, could be considered as appropriate, and supplemented by others, where necessary:

 - on the durability or reliability of the product or its components
 - on reparability and upgradability, including a reparability scoring

⁵⁶¹ or Environmental Footprint profile, when the PEF method is used. If the information requirements are based on PEF impact categories, this would require manufacturers to perform a PEF study (following an adopted PEFCR) for each model of product put on the market. Dedicated IT- software would be made available by the Commission to allow SMEs and any other company to perform the required calculations minimising costs and resources.

⁵⁶² For example, rate of injuries and illnesses per working hour, Ratio of annual cost of health and safety measures vs turnover, percentage of workers paid a minimum wage, etc.

- on the presence of substances of concern and tracing them, linking with the SCIP Database where relevant
- on the recycled content or recyclability of the product or its components

Information requirements could be provided in the form of environmental performance classes, possibly taking the form of a label

For all information requirements the questions to answer are: How to define the exact content, calculation methods, prepare implementation/enforcement? Which information should be provided by the EU DPP and how this should be implemented?

- **Other possible measures requiring methodological developments:**
 - horizontal requirements covering a large number of products sharing common characteristics⁵⁶³
 - provision of guidelines for Member States to introduce reputational and economic incentives
 - requirements to Member States to use classes of performance for reputational and economic incentives
 - mandatory Green Public Procurement requirements
 - ban on the destruction of unsold consumer products

The requirements resulting from this process should be technology neutral for the manufacturers (i.e. not technology-prescriptive). By setting the requirements, the dominant environmental impacts should be considered as well as additional strategic indicators/metrics reflecting the political priorities (e.g. energy efficiency or critical raw materials). The requirements should be set in such a way, that the dominant environmental impacts of the product will decrease without impacting negatively other impacts and the strategic indicators.⁵⁶⁴ To achieve this, the methodology will assess the impacts of single improvement options as well as of their combinations. Furthermore, in order to properly assess the impact of CE aspects, the impact of the product should be assessed per unit appropriate to the part or product concerned (e.g. number of years or number of uses). The durability of the product will take into account the possible extension of the original durability of the product according to the CE measure applied. When trade-offs are identified (options improving some aspects at the detriment of others, or incompatible options dealing each with different aspects), they should be presented transparently, with all consequences of options and possible ways to mitigate their negative consequences.

The definition of such requirements should make use of different methodologies, standards and methods, depending on the products or the requirements concerned. In particular, for:

- **energy efficiency:** The MEErP and its ongoing revision include a method for setting out requirements on energy efficiency.
- **durability:** While there are already some requirements for energy-related products⁵⁶⁵, the review of the MEErP is looking into the systematic inclusion of durability in the methodology. For certain products, approaches for determining durability are available, e.g. through ISO or EN standards. In particular, the approach provided by EN 45552:2020 "General method for the assessment of the durability of energy-related products" may be used as a basis. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. An approach to the durability of apparel is also being developed in the framework of the PEFCR on apparel and footwear, to enable the PEFCR to take durability into account. A similar exercise was done for decorative paints during the EF pilot phase. Further standards or

⁵⁶³ this would have the possibility to tackle large improvements potentials in terms of environmental and social impacts

⁵⁶⁴ justification should be provided, if this approach is not possible for a possible product and a trade-off has to be done regarding the indicators.

⁵⁶⁵ For example, operational motor lifetime and hose durability for vacuum cleaners

technical specifications may be needed for specific products or groups of products – to be decided when developing requirements for specific products.

- **Reparability:** While there are already some requirements for energy-related products⁵⁶⁶ (dismantling of spare parts with the use of commonly available tools without damage to the product, minimum spare parts and repair information to be made available, minimum time of availability and minimum time of delivery), the review of the MEERp is looking into the systematic inclusion of reparability in the methodology. The approach provided by EN 45554:2020 "General methods for the assessment of the ability to repair, reuse and upgrade energy-related products" may be used as a basis. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. In particular, it defines parameters and methods relevant for assessing the ability to repair products; the ability to access or remove certain components, consumables or assemblies from products to facilitate repair. In addition, the JRC report on reparability scoring (which takes account of this standard) can be used for such requirements.
- **Reusability:** The approach provided by EN 45554:2020 "General methods for the assessment of the ability to repair, reuse and upgrade energy-related products" may be used as a basis. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. In particular, it defines parameters and methods relevant for assessing the ability to reuse products; the ability to access or remove certain components, consumables or assemblies from products to facilitate reuse.
- **Upgradability:** The approach provided by EN 45554:2020 "General methods for the assessment of the ability to repair, reuse and upgrade energy-related products" may be used as a basis. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. Among others, this standard defines parameters and methods relevant for assessing the ability to upgrade products; the ability to access or remove certain components, consumables or assemblies from products to facilitate upgrade.
- **Ability to remanufacture:** The approach provided by EN 45553:2020 "General methods for the assessment of the ability to remanufacture energy-related products" may be used. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. This standard elaborates the assessment and process of re-manufacturability in a horizontal, cross-product way. However, a fully appropriate assessment can only be done in a product-specific way, taking into account specific parameters of a specific product.
- **Recyclability, including high quality recycling:** While there are already some requirements for energy-related products (design for dismantling, recycling and recovery, marking of components, availability of dismantling information), the review of the MEERp is looking into the systematic inclusion of recyclability in the methodology. The approach provided by EN 45555:2019 "General methods for assessing the recyclability and recoverability of energy-related products" may be used. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. This standard provides a general methodology for

⁵⁶⁶ https://ec.europa.eu/commission/presscorner/detail/en/qanda_19_5889

assessing the recyclability of energy-related products, their recoverability, the ability to access or remove certain components or assemblies to facilitate their potential for recycling or other recovery operations, the recyclability of critical raw materials. Requirements on chemicals – restriction on chemicals hindering recyclability or other sustainability aspects not directly connected to chemical safety, tracking of substances of concern, including those hindering recyclability is considered. Checks have to be performed to determine whether materials contain chemical substances that affect recycling as part of a more general requirement to track substances of concern in products. ISO22628:2002 for automotive products is also relevant.

- **Recycled content:** The approach provided by EN 45557:2020 "General method for assessing the proportion of recycled material content in energy-related products" may be used. The standard has been developed for energy-related products, however as energy consumption is not part of the method, the principles of the standard seem to be applicable to all types of products. Standards and guidance also exist on the traceability of specific material streams, e.g. EN 15343:2007 Plastics – Recycled Plastics – Plastics recycling traceability and assessment of conformity and recycled content.
- **Resource efficiency:** While there are already some requirements for energy-related products (e.g. water efficiency), the review of the MEErP is looking into the systematic inclusion of resource efficiency in the methodology.
- **Carbon/Environmental footprint:** For products where life cycle environmental performance is an important determinant of environmental performance, requirements may take the form of thresholds of carbon or environmental footprint (e.g. products with a life cycle carbon footprint higher than x kg CO₂ equivalents would not be able to enter the market for a given product category). The EU tool available for covering this aspect is the EU PEF method. The EU PEF method defines how to calculate the life cycle environmental performance of a product along 16 impact categories: climate change, ozone depletion, human toxicity – cancer, human toxicity – non-cancer, particulate matter, ionising radiation – human health, photochemical ozone formation – human health, acidification, eutrophication – terrestrial, eutrophication – freshwater, eutrophication – marine, ecotoxicity – freshwater, land use, water use, resource use – minerals and metals, resource use – fossils. The PEF method covers all emissions from cradle-to-grave (whole life cycle, i.e. from the extraction of raw materials until the end of life of the product). The PEF method relies on existing approaches whenever possible (e.g. it relies on related ISO standards), but where several methodological choices are available, it chooses a common approach wherever feasible. The method was revised based on these experiences and an updated version of the Recommendation on the use of Environmental Footprint methods was published in December 2021⁵⁶⁷. Several ISO standards have been under consideration while developing the PEF method: ISO 14044:2006 specifies requirements and provides guidelines for life cycle assessment (LCA); ISO 14025:2006 establishes the principles and specifies the procedures for developing Type III environmental declaration programmes and Type III environmental declarations. Additionally, PEFCRs define benchmarks, which correspond to the average performance of a product on the EU market. This allows to set classes of performance, which could be a further input for defining SPI requirements (thresholds or information requirements).

⁵⁶⁷ https://ec.europa.eu/environment/publications/recommendation-use-environmental-footprint-methods_en

Furthermore, it should be noted that the PEF method allows for a comparison of intermediary products and therefore for the setting of requirements on environmental footprint of intermediary products, .

MONITORING THE RESULTS OF SPI (STEP 4)

The monitoring of SPI should cover a broad scope of environmental and social impacts as well as resource aspects (incl. Critical Raw Material).

Two levels of monitoring would be possible:

- on the **micro level**: based on the reporting obligations of manufacturers (technical documentation) possibly provided through the EU digital product passport where this is implemented within SPI, it will be possible to monitor the trends for a specific product category. The IA considers also a measure enabling the Commission to request market data from economic operators. This will facilitate the review process of product regulations under the SPI framework.
- on the **macro level**: the impact of all products regulated by SPI should be monitored. Monitoring indicators are considered in this IA (see Annex 13)⁵⁶⁸. The methodology should provide the approach for collecting the information, calculating the indicators and making the link between micro and macro levels indicators – how are progresses at product level reflected or not at higher level?

IMPORTANT REMARKS

The draft SPI methodology needs to be further developed. The objective is to introduce a highly coherent and consistent approach, maximising synergies with other existing legislation and tools. However, it will also include the required flexibility to fully take into account specific issues, when relevant.

Regarding the **environmental dimension**, the main open points are:

- Link to the Life Cycle Costs: if the externalities were taken into account, which parameters should be considered? Are there alternative methods to rank improvement options and take account of the costs for the end user and/or for society as a whole?
- Identify suitable approaches to address specific environmental issues that are not yet sufficiently covered in international standards and methods (e.g. marine litter, microplastics, etc.);
- Energy should be included in the methodology not only in relation to whether it is renewable or fossil, and not only in the supply chain. Energy at the use stage and energy efficiency should be considered too.
- Circularity aspects may require to consider not only the life cycle of the product in assessment, but also of other products using the same material (assessment of recyclability and recycled content) or even some components (in relation to remanufacturing).
- Methods for the definition of Green Public Procurement requirements in SPI product-specific rules, requirements on reputational and economic incentives and on the modulation of EPR fees, and requirements banning the destruction of unsold consumer products may require specific developments.

⁵⁶⁸ Annex 13 distinguishes two sets of indicators: 1) Core indicators for the monitoring and evaluation of progress towards desired results (impact areas considered: environmental and socio-economic) and 2) Core indicators for the evaluation of attainment of the desired impacts (expected impacts considered: increase in environmental sustainability of products consumed in the EU, increase in social sustainability of products consumed in the EU)

Regarding the **economic dimension**, the following points will be investigated:

- Some costs, as labour costs associated with repair operations, can vary significantly across the EU. How can this be taken into account?
- The use of third-party verification/certification may require specific methodological developments: when to require it? How to define exactly what should be certified and how? What is the cost for third-party verification/certification (i.e. calculation of the 3rd party costs in order to feed the economic analysis or the LCC curve)?
- The economic dimension of circular business models should be better taken into account, for example to compare purchase and leasing costs;

Further points will have to be clarified in the elaboration of the methodology:

- Trade-off between increased durability and improvement of product performance with time due to technological progress;
- Possible trade-offs between durability and reparability/recyclability;
- other trade-offs: see above (options improving some aspects at the detriment of others, or incompatible options dealing each with different aspects)
- The likely number of repairs or upgrades per product group should be investigated
- Resources required to apply the methodology by different actors (time and cost)?
- Flexibility for approach to differ between different product groups
- International aspects (i.e. need for analysis or validation for impacts outside the EU, and analysis of trade aspects, or non-EU legal aspects, impacting on the definition or implementation of requirements)?
- Governance rules and the role of the European Commission when requirements development features an active role for external stakeholders (e.g. drafting of PEFCR lead by industry); assessment of risks and possible mitigation measures of these risks.

Annex 17: Environmental impact variation within product groups

ASSUMPTIONS ON ENVIRONMENTAL IMPACTS

This annex looks at the variation in environmental impacts for some selected product groups.

PURCHASE DECISIONS WITHIN SAME PRODUCT CATEGORY

This includes purchase decisions by consumers, businesses⁵⁶⁹ and the public sector.

The **baseline** for this element is derived from the JRC-developed normalisation data for the EU27 of 2010⁵⁷⁰, modified to consider developments until 2030 in view of the anticipated reduction of climate change impacts under the EU Green Deal and other commitments. The following considerations and limitations apply:

- The EU is a net importer of environmental impacts, a trend that is increasing⁵⁷¹. The overall EU-wide consumption-based environmental impact is likely to be at least 10% higher than impacts generated on the EU territory (the figure is a few percent for climate change, above 10% for acidification, eutrophication, photochemical ozone formation and particulate matter; unknown but likely more for several toxicity impacts, land use, resource depletion). As the EF methods take into account the whole value chain and the uptake of EF analysis is expected to trigger impact reductions in global supply chains, this would lead to a higher potential for impact reduction. However, due to challenges in identifying changes in the “import” of impacts, this effect is not taken into consideration.
- EU policy efforts are expected to reduce the EU’s environmental footprint by 2030, therefore the amount of emissions is expected to be reduced. For example, due to improvements by 2030 a decision to purchase a greener product in 2030 will correspond to less reduction of kg CO₂ equivalents than now (i.e. 50% reduction in 2024 correspond to more kg CO₂ equivalents than 50% reduction in 2030). The analysis starts from the EU aim of reducing the EU (territorial) GHG emissions by at least 55% until 2030 compared to 1990⁵⁷². In 2019, this figure is 24% below the 1990 values. It uses the forecasted figure for 2027 for the EU27 to scale the savings for EF-supported decisions until 2030. EU27 territorial greenhouse gas emissions (without LULUCF⁵⁷³) were 3,744 Million tonnes per year in 2019 and were forecasted for 2030 to go down to 3,415 Million tonnes CO₂-equivalents per year⁵⁷⁴. The value for 2027 is 3,504 million tonnes CO₂-equivalents per year.
- A relevant share of the annual emissions is related to the operation of durable products such as vehicles and buildings, i.e. those will continue to emit despite changes in purchasing

⁵⁶⁹ To avoid double counting/ overlaps, we did not include purchases of intermediate products – taking into consideration that products are in each other’s life cycle. By completely disregarding these purchases, we underestimate the benefits of the possible green claims policy.

⁵⁷⁰ These data are territorial, i.e. do not consider import and export of products and the associated environmental impacts.

⁵⁷¹ European Commission (2012): Life cycle indicators for resources: development of life cycle based macro-level monitoring indicators for resources, products and waste for the EU-27. European Commission, Joint Research Centre, Institute for Environment and Sustainability. EUR 25517 EN. ISBN 978-92-79-26423-8. doi:10.2788/49877

⁵⁷² “The effective implementation of national energy and climate plans as submitted to the Commission in 2019/2020 could lead to EU-27 greenhouse gas reductions of 41% in 2030 compared to 1990. Projections indicate that, if current EU and national policies are fully implemented, EU-27 greenhouse gas emissions reductions by 2030 would be around 45% lower compared to 1990 levels when excluding land use emissions and absorptions, and around 47% lower when including land use. The existing legislation will now be updated with a view to implementing the new proposed target of reducing net greenhouse gas emissions by at least 55% by 2030. The Commission will come forward with proposals by June 2021.” (https://ec.europa.eu/clima/policies/strategies/progress_en)

⁵⁷³ LULUCF corresponds to greenhouse gas emissions and removals from land use, land use change and forestry

⁵⁷⁴ EEA: <https://www.eea.europa.eu/data-and-maps/data/greenhouse-gas-emission-projections-for-7> EU27, i.e. excl. UK.

choices. Even though for buildings renovation measures are used to reduce their environmental impact for the remainder their lifespan, these changes are done typically at the end of the technical life time of e.g. heating systems, or when other major renovations are undertaken. Decisions in the course of renovations/ new built could be influenced by EF-based claims, while they cannot influence the performance other buildings in use. For vehicles, we assume that EF-based green claims would act only on new vehicles. It is challenging to quantify this effect: for products with long lifetimes, overall purchasing decisions act only on a part of overall emissions, as not all products are replaced, repaired and/or improved each year. To mitigate these limitations and uncertainties in the modelling, we assume a conservative reduction figure of 50% for all products (thus, also for space heating and cars). The figure is conservative, as GHG reductions of purchase decisions for these products were found to be more in the range of 67% (vehicles) to >90%. For these products, we don't take into account consumption-based additional reduction potential.

- The environmental impact figures are mostly provided for climate change impacts, while the benefit of EF-driven purchasing decisions is per definition always reducing the overall aggregated environmental impact. We argue that on average, all other 15 impact categories would be reduced to the same extent. The broad coverage of products means that specific differences (e.g. agricultural products have much higher contribution to land use and water use than most other products) are levelling each other out. Also for these impacts, the attributed reduction under the green claims policy is proportionate to the climate change reductions. At the same time it is crucial to explicitly consider all the other impacts in calculating benchmarks per product category and impacts of individual products, to avoid the shifting of burdens among impacts.
- The relative contribution to the EU wide impact per broader product group / consumption cluster is mainly taken from the Environmental Impact of Products (EIPRO) study⁵⁷⁵, noting the limitation of data age and the sector-based method that does not always match the product based differentiation in this report. The categories have been combined and renamed to some degree.

⁵⁷⁵ Tukker, A.; Huppes, G.; Guinée, J.B.; Heijungs, R.; Koning, A. de; Oers, L. van; Suh, S.; Geerken, T.; Holderbeke, van M.; Jansen, B.; Nielsen, P (2006): Environmental Impact of Products (EIPRO) Analysis of the life cycle environmental impacts related to the final consumption of the EU-25. European Commission, JRC-IPTS. Technical Report Series, EUR 22284 EN.

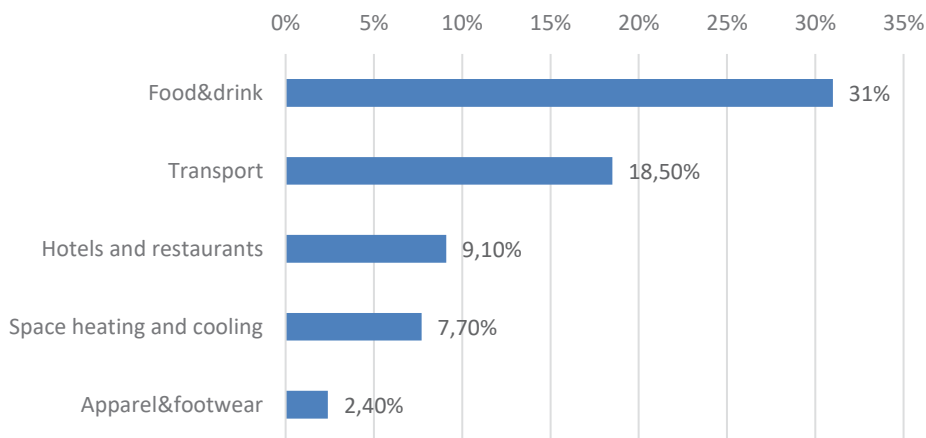


Figure 1 Relative contribution to the EU wide impact per broader product group / consumption cluster

- In terms of the number of products per category that might carry PEF-based information, we assume that 600 products per PEFCR would do so on average. If we divide the approximately 120 million products (by stock keeping unit - SKU) on the EU market (assumed to be about half of the 240 million products globally that carry a European Article Number, i.e. EAN code) by the roughly 5,000 representative products in the 1,000 PEFCRs that could cover (most of) the entire market, we would have on average up to 24,000 products under each representative product. Considering the considerable variation of the number of products per PEFCR⁵⁷⁶ and that some of the prominent product categories will have a very low number of distinct product that require a distinct PEF study, we assume a smaller average number of products per PEFCR, namely half of the 120,000. **We estimate that a typical PEFCR could cover some 60,000 distinct products.**

The net impact reduction potential of any individual purchase decision per broader product groups / consumption cluster. The potential is the relative difference between the average product on the market and the one with among the best performance. These percentage values are compiled for specific product examples, averaged and used as potential reduction factor for the respective broader product groups of relevance for the green claims initiative.

For clarity and due to data availability, we use reduction in climate change impacts as stand-in for the whole range of impact covered by the EF. While 50% is frequently found as reduction potential for a purchase decision (see more below), for some of the most relevant product categories, substantially higher savings were found: 80% for cars and 95-98% for electricity and space heating (see more below).

As to the reduction potential across the various impact categories, we consider the numbers in the tables below to be less differentiated than they would be under the more rigorous PEF/OEF methods and using EF background data: many existing studies have a reliable carbon footprint, but other impacts are often stemming from energy conversion processes mainly, i.e. fossil power plants and process heat. Hence, impacts tend to closely correlate with climate change, while in truth there is substantially more variation.

⁵⁷⁶ There are e.g. less than 250 distinct car models on the market. Also the number of distinct space heating and electricity products on the EU market is assumed to be well less than the average 120,000 products per PEFCR. For other products such as e.g. dairy products, or toys, the number is argued to be very big; it was not possible to get robust numbers per product category, however. We note in this context that the exact number has little effect on the benefit of impact savings the PEF can have, therefore this lack of quantitative data is not an issue.

However, also the baseline foresees that some of these potentials are realised by autonomous developments and due to other policies. So, the reduction potential needs to be reduced in a second step, considering only the net extra reduction that is attainable due to the policy. This refers to policies that act on the final product, but also on relevant upstream impacts, e.g. for battery driven vehicles also policies that act on electricity production resulting in an increasing share of e.g. renewable energy, as this improvement is part of the life cycle-wide impact reduction. The commonly used factor for this is also 0.5.

*Vehicles and mobility, person transport services, goods transport*⁵⁷⁷

For three specific car example pairs of battery electric vehicles (BEV) vs. internal combustion engine (ICE) cars of the same car class, a recent study⁵⁷⁸ found differences and hence reduction potential for climate change of between -54 and -82%, with an average value of - 67%, using the grid mix for electricity production. The conventional vehicles of those pairs does not represent a worst case, but a typical case, so we consider this to be the average case from which to derive the potential reduction.

The authors note the substantial reduction in climate change impacts that have been achieved for battery production in recent years, what reduces the net contribution of the battery to the future BEV car production impacts and hence increases the net benefit over the entire life cycle. Further improvement that can be expected for the next years is not considered, hence make the reduction estimate even more conservative.

As to the reduction that is achieved by other policy instruments, the upcoming batteries regulation⁵⁷⁹ includes the carbon footprint (based on the rechargeable batteries PEFCE), but does not cover comparisons of battery applications, e.g. vehicles with different drivetrains against each other.

Over the period 2021-2030, the analyst Fitch solutions expect nominal sales growth of electric vehicles of 383.1%, with units sold reaching almost 6.2 million in 2030 in Europe⁵⁸⁰, These projections do not considering the green claims initiative and other policies under development until then.

Beyond the change from of diesel/gasoline to electricity driven vehicles, there is an additional reduction potential from shifting from the grid mix to renewable/green electricity. If the use of green electricity is considered to charge the batteries, the extra reduction potential of the electricity change itself weighs in, at -98% for climate change. Factoring this in, the combined reduction potential from conventional diesel/gasoline ICE to a green electricity powered BEV is approximately - 80%.

Space heating and cooling systems

Changing the EU28 space heating mix with an efficient heat pump operated with EU grid mix electricity reduces the climate change impact by 52%, while very variable for other impacts. If, in addition, the heat pump is operated by a green electricity mix, the impact reduction is much higher: the electricity environmental footprint is by far the main contributor (with the equipment production life cycle-wide impact contributing only to a limited extent). The reduction potential – similar to electricity itself – is close to 98%, possibly about - 95% compared to the current space heating mix.

⁵⁷⁷ Note: airplane transport is not considered to be highly relevant for PEF, because a) ongoing and cost-driven efforts to reduce fuel consumption are expected to realise most of the attainable reduction, and b) very long development cycles for new aircraft technologies, what limits the possibility of breakthrough changes within the next decade. Still, the change to renewable feedstock based kerosene is an avenue that could be better informed with the help of the PEF, next to e.g. the Renewable energy Directive and Fuel quality Directive. Input considered: IATA (2019): Aircraft Technology Roadmap to 2050

⁵⁷⁸ Auke Hoekstra & Maarten Steinbuch (2020): Comparing the lifetime greenhouse gas emissions of electric cars with the emissions of cars using gasoline or diesel. Eindhoven University of Technology.

⁵⁷⁹ <https://ec.europa.eu/environment/waste/batteries/>

⁵⁸⁰ Estimate of Fitch Solutions, 2021

Electricity

The change of electricity used has a particularly big environmental benefit. To estimate reduction potential, we use the EF 3.0 datasets of the electricity grid mix (example Germany) against wind power mix as one of the best performing options. The reductions are - 98% for climate change, - 99.9% for land use and - 94% for water use. We use the -98% figure for the general impact reduction potential, which reflects the reduction potential from switching from the grid mix to a green mix (e.g. wind power or certified green electricity mix). This is one of the product categories where the reduction potential is very high.

Equal competition based on environmental performance between electricity sources, as assessed against the grid mix would require taking into account a broad range of impact categories.

Based on the data referenced above, if studies consider climate change only, electricity from solid biomass has about 1/5 of the impact of electricity from biogas, and 1/9 of the impact of the grid mix. The weighted single score impacts would show impacts from biogas and biomass-based electricity to be almost the same and both would still have about 2/3 of the grid mix impact: this is due to relevantly higher impacts in land use (around 100 times higher), water use and some other impacts, even though climate change has a high relative weight among the impacts. When also considering wind power, electricity from both solid biomass and wind power would be among top performers based on climate change only. When using the single score, only wind power would be a top performer: wind power has a much lower (1/15) single score impact respectively to electricity from solid biomass. In other words: climate change alone may lead to false decision support.

Apparel and footwear

A study identified the following range of lowest and highest environmental impacts⁵⁸¹:

Table 98 Range of lowest and highest environmental impacts

| | Climate change (kg CO ₂ equivalents) compared to... | | Freshwater eutrophication, compared to... | | Water depletion, compared to... | | Land use, compared to... | |
|--------------------------------------|--|--------------|---|--------------|---------------------------------|--------------|--------------------------|--------------|
| | Mean values | Worst values | Mean values | Worst values | Mean values | Worst values | Mean values | Worst values |
| Cotton t-shirt ⁵⁸² | -42% | -81% | -40% | -80% | -47% | -80% | -25% | -56% |
| Wool knitwear | -58% | -77% | -60% | -84% | -51% | -70% | -51% | -70% |

⁵⁸¹ 2nd Edition of the Environmental Impact Valuation as base for a Sustainable Fashion Strategy. White paper Hugo Boss. Heinz Zeller, Rainer Zah, Michela Gioacchini and Mireille Faist

⁵⁸² Per piece of the same size. Note that this table does not yet consider the purchase change between natural and synthetic fibre, which are expected to yield a higher reduction potential, than within the cotton T-shirt variants.

By averaging all values, the reduction from mean to best is -46%. We assume **a reduction of 50%**, which reflects the environmental impact reduction due to purchasing a product that has a top class of performance as opposed to buying a product of unknown impact.

Raw materials from agriculture

For cotton growing per kilogram a -50% reduction respectively to mean values and 78% respectively to worst values were found.

Annex 18: the European Digital Product Passport (EU DPP)

A. VISION, CONCEPT, SCOPE AND STRATEGY

Why a European Digital Product Passport?

Transition to sustainability and circular economy requires smarter management of product-related data across the product life-cycle, from manufacturing to use, re-use and recycling. Most of this information exists somewhere, but is not available to all actors along the value chain today (see figure below). This is lost potential for the entire economy, and increases EU dependency on primary materials. Circular economy is primarily about value retention in the economy, and increasingly the value of products is bound up in the data they hold or generate. The loss of this data therefore implies lost value for companies and the wider economy, less informed consumers and authorities, less efficient processes along the life-cycle of the product (production, maintenance, repair, recycling), lost functionality for consumers, and negative environmental impacts of premature replacement.

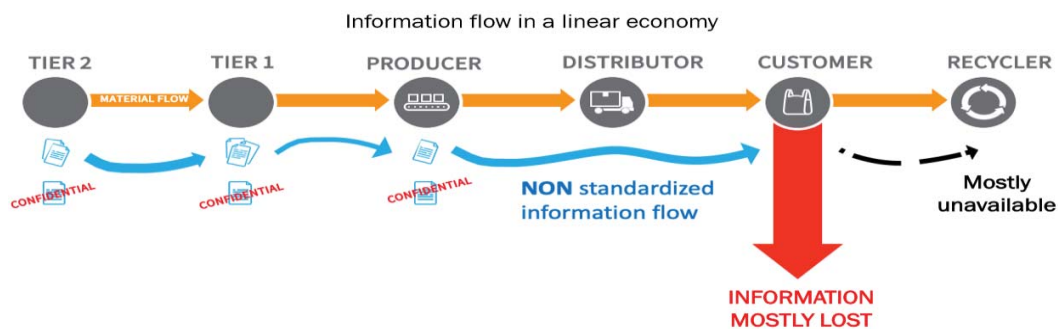


Figure 1 Information flow in a linear economy

Digital technologies already provide the possibility to localise and share product-related data, down to the level of the individual components and materials. The emergence of tracking and tracing technologies has revolutionised many aspects of value chains in recent decades, enabling companies to manage their logistics, just-in-time systems, customer services, marketing, inventories, reporting and accounting. As industry has applied these technologies, their costs have diminished, and the power to manage associated data has expanded strongly.

Consumers, governments, and civil society organizations are increasingly demanding that businesses behave responsibly and recognise and resolve current and potential harmful effects on human rights, the environment, and human health. Enterprises more and more aim for displaying credibly their sustainability efforts, while there is also growing cynicism at “green washing” and false claims, which undermine the efforts of those companies providing bona fide information. This has led more recently many industry sectors applying technologies to improving product traceability and transparency. However these various initiatives lack a common and consistent language and protocol for exchange and access data across the product lifecycle.

The EU DPP can play an important role as a means for digital transformation of the internal market. It may facilitate customs and market surveillance authorities to better carry out their duties on the basis of standardised information, in some cases already verified through independent third-parties. For example, this could be a useful feature to implement policies like the upcoming Carbon Border Adjustment Mechanism, by including the carbon footprint of the imported intermediate products (e.g. steel). The EU DPP can also be expected to help public authorities at various levels by facilitating the monitoring of material flows and waste generation and enabling the estimation of scope 3 emissions⁵⁸³ related to products.

The proposed European Digital Product Passport (EU DPP) will harness the technological possibilities for product identification, tracking and tracing, to ensure that data essential for other businesses, consumers and public authorities to promote sustainability and circularity is made accessible. Such accessibility implies agreement on standards, ontology and interoperability.

What would the European Digital Product Passport do?

The EU DPP will enable citizens and economic actors to quickly and easily find answers to their inquiries regarding the product in front of them: Where did this originate? What materials is it made of? Which spare parts are available? How am I to best utilise it? What effect does it have on the environment? What is the best way to recycle it? How can I safely dispose of it?

Moreover, it will enable a number of potential benefits for different actors along the value chain, as explained in Table 99.

⁵⁸³ Indirect Emissions from activities of the organisation, occurring from sources that they do not own or control. These are usually the greatest share of the environmental footprint, covering emissions associated with raw materials, components, chemicals, logistics, etc.

Table 99 Potential benefits of the EU DPP for different stakeholders

| INPUT SUPPLIER | PRODUCER/ Intellectual Property (IP) right holder | RETAILER/ RESELLER | CONSUMER | MAINTAINER/REPAIRER/UPGRADER | RECYCLER | PUBLIC AUTHORITY |
|---|---|--|---|---|---|--|
| <p>Transparency and traceability enhance trust in sourcing. Clear chain of custody simplifies due diligence and ensures level playing field where compliant suppliers are authenticated and not undercut by unscrupulous suppliers.</p> | <p>Potential repeat revenue from products through maintenance, resale or other circular business models. Customer engagement – cross-selling, service etc</p> | <p>Instant digital identification of products</p> | <p>Easy access to transparency and life-cycle sustainability information on product (eg water, land and pesticide use in cotton production, pre-washing of synthetics to remove microplastic particles). Enabling choice between comparable products.</p> | <p>Trusted source of information on the spare parts. Certification of origin or of conformity with the requirements of the Original Equipment Manufacturer (OEM).</p> | <p>Identification of products and materials</p> | <p>Progress towards decoupling of growth from resource depletion and its impacts on climate, biodiversity and pollution.</p> |
| <p>Digitally enabled information exchange across end-to-end value chains, enables customer feedback (including recall if necessary)</p> | <p>Post sale data, intelligence and insights from products and customers</p> | <p>Access to essential product and material data for scale and optimising resale value</p> | <p>Access to tailored services (apps) to process extensive and complex sustainability data and provide guidance on sustainable choices</p> <p>Potentially provided by retailers, consumer organisations, NGOs, companies etc</p> <p>The transparency and credibility of such services when marketed towards consumers will be ensured by minimum fairness requirements to be introduced in the initiative on Empowering</p> | <p>Instant access to information necessary for maintenance, repair or upgrade:</p> <ul style="list-style-type: none"> • Process of dis-assembly / re-assembly; • Test & diagnostic procedure; • List of spare parts and of means to access them; • Instructions for maintenance / repair; • Specifications of modules and components. <p>Potential for industrialising maintenance & repair operations, and hence to</p> | <p>Automated sorting and separation of materials at levels of detail sufficient to ensure high purity, and hence high quality of recyclates (comparable to virgin raw materials – no “downcycling”) , and at speeds and costs compatible with competition with virgin materials</p> | <p>Improved strategic autonomy due to increased stocks and flows of recyclates</p> |

| | | | | | | |
|---|--|---|---|---|--|--|
| | | | Consumers for the Green Transition. | improve competitive position on cost and quality of maintenance or repair vs. purchase of new product. | | |
| Closed loop systems enabled, so that dependable and uncontaminated secondary raw materials are recaptured. | Operational capacity to meet transparency requirements and provide due diligence information regarding supply chains (including the fight against counterfeiting), based on inclusion of data regarding sourcing and on consolidation of data received from suppliers. | Facilitate measurement for non-financial and CSR reporting with view on full lifecycle impact of products | Care instructions | Safe operations in maintenance, repair and upgrade operations by clear location of parts with hazardous substances. | Increased quantity of fibre-to-fibre recycling (which is today at about 1% in Europe), and increased quality (and therefore increased value and revenue) of secondary materials due to reduced contamination and mixing. | More accurate analysis of investment gaps in industrial ecology for textile recycling infrastructure |
| Recovery for remanufacturing facilitated. | Inclusion of data to enable automated ecomodulation of fees in potential extended producer responsibility schemes | Data exchange with brand, recyclers etc. | On-going services from brand, repair etc. | Capacity to engage in preventive and predictive maintenance, based on data accumulated over the full lifecycle of the product and of each part. | Operationalisation of reverse logistics | Better direction of research funding to develop substitute chemicals, chemical recycling processes and sorting technologies. |
| Re-manufacture of spare parts of product models no longer supported by their OEM is facilitated, because the technical file is digitally available. | Data exchange with retailers, consumers, recyclers to enable sustainable commerce. Reduced cost of due diligence by sharing information with several other IP right holders regarding safety, the fight against counterfeiting or other environmental or social sustainability inspection of production facilities, instead of each carrying out their own inspections. | Ensure authenticity of product | Information to enable resale recycling. Trust in authenticity for resale | Capacity to maintain or repair product models no longer supported by their original OEM. | Identify and exclude problematic dyes and adhesives that can ruin a recycling batch (eg: PVC screen prints on polyester) | Easier reporting on collection, sorting and recycling rates of textiles (in view of incoming legal obligation for separate collection) |

| | | | | | | |
|---|--|---|--|---|---|---|
| Provision of proof of recycled content in materials, so comply with future requirements on this feature | Authentication and identification of products | Supply customers with trusted information | Visibility into product certifications | Enable the provision of guarantees following maintenance, repair or upgrade at a level equivalent to that of new product. | Facilitate measurement and reporting of recycling (including in view of legal obligation for separate collection of textiles in municipal waste from 1/1/24) | More accurate data on textile resource flows and their environmental impacts (climate, pollution, resource depletion etc). |
| | Combatting counterfeits through identification/authentication | Consumer confidence in green claims | Access to brand content – styling resources, etc. | | Enable programming of investment to meet demand | Potential jobs in circular value retention activities. |
| | Evidence of taxonomy alignment to facilitate access to green funding. | | Access to leasing, peer-to-peer lending and other services, for example sharing of expensive and seldom used garments (ski-wear, ball gowns, wedding attire etc) reducing purchasing costs for consumers and increasing the optimisation and added value of the product. | | Recuperation of certain vat and reactive dyes (eg: Indanthren Blue, Red and Brilliant Green, Levafix Blue, Remazol Brilliant Blue, Remazol Black B) for re-use. | Facilitation of green public procurement (eg: uniforms for emergency, military and health workers, textiles for hospitals etc) based on dependable life-cycle data. |
| | Provide access to Life-cycle data as validation for “green claims” (in line with future requirements). Providing access to EU Ecolabel data. Rewarding those putting bona fide green products on the market. | | Potential to verify “green claims” on the product | | Identification of more valuable fibres (eg: cashmere) for re-use. | |

With a harmonised EU DPP:

- Companies will be better able to address financial, operational, and reputational risks through increasing transparency in value chains. Traceability in value chains also enables businesses to react more quickly to unexpected disruptions, comply with relevant rules and regulations, guarantee product quality and safety, fight

counterfeiting, provide follow-up services and adapt product designs according to real-world and even real-time performance. Companies providing services further down the value chain also benefit, for example repair and maintenance services benefit from technical information and spares, remanufacturers have access to important information regarding components, and recyclers benefit from information on hazardous or valuable materials.

- Consumers benefit from increased transparency and access to relevant data since they have more, and more accurate, information about the sustainability, life cycle and circularity claims made regarding goods and processes. As a consequence, traceability and transparency have a lot of potential for fostering trust among all stakeholders in the value chain.
- Administrations can exploit synergies between different information systems already existing, optimising resources and focusing on areas of major concerns from a regulatory viewpoint.

How would the European Digital Product Passport work

The EU DPP objectives, its governance, principles on access rights (need-to-know basis), importance of global standards, typology of information that could be requested, could be put in place through the main SPI horizontal legislation, and apply to all intermediate and final products in scope of SPI.

The starting point for the development of specific EU DPP are product groups covered by the SPI. However, the operationalisation of specific EU DPP will need to be rolled out progressively, focusing on product groups where the potential for and benefits of sustainability and circularity are strongest, and where evidence is available. For those products or product groups, detailed requirements for example concerning minimal data or technical aspects, the detailed access rights management, data verification, etc., will be developed through secondary legislation to the horizontal act. The detailed requirements will be based on product specific impact assessments. Steps to operationalise product (group) specific passport will be carried out in close collaboration with stakeholders and standardisation organisations, also building on the results of the research projects like those funded by Digital Europe Programme starting from 2022. Further piloting and supporting studies may be fostered as considered necessary.

Although SPI will widen the scope of application of Ecodesign to a very wide range of product groups, it may be that its passport requirements could be reflected in other sectoral legislations (e.g. as already happened in the case of the new Battery Regulation).

The EU DPP specific information could be composed of two main “families” of data:

- **“Track & trace”** information, composed of categories of information that are common to all product groups;
- **“Attributes”**, including categories of information that are specific to a product group.

Both families of data could become accessible to the users through a unique identifier, meaning a multi-functional data carrier (e.g. a QR code) to be attached to the product.

An alternative option could have been to develop the EU DPP as a separate self-standing legislation. While this approach could allow a wider number of product groups to be in scope

of the EU DPP, it might also require longer development time. Other legislative initiatives that would like to use it for conveying information⁵⁸⁴ would have to put a placeholder for allowing this instead of copying first the few requirements that could be introduced in the framework, and copying later on the detailed requirements that will be laid down in a horizontal SPI measure. This approach would guarantee a truly coherent way of implementing various passports, eliminating the risk of loss of interoperability by copy pasting requirements from one legislative instrument to another.

However, as the EU DPP follows the same structure and process as Ecodesign rules, it seems more logical that it becomes a key element of the Sustainable Product Initiative, based on application of the Ecodesign Directive across the Single Market. It can play an important part in achieving the objectives of the SPI due to its potential to make available in a systemic, coherent and interoperable way, information considered essential to empower businesses to adopt circular and sustainable models and activities.

The EU DPP could be implemented via a system that relies on data collected along the value chain, including a unique product identifier. These data should be structured, with a clear, standard ontology of meta-data, so that it be susceptible to automated search and processing.

The EU DPP system aims to integrate existing information but this may need some adaptations in how the database hosting this information are structured. and may require technical changes to the systems The extent of these changes, and the assessment of costs and benefits, will be analysed in depth in the context of the detailed design of the EU DPP data architecture, with the objective of achieving the highest degree of interoperability with the minimum degree of changes to existing systems and related adaptation costs.

The EU DPP is not meant to accumulate exhaustive data, but rather to make available to different stakeholders targeted information on a “need-to-know” basis⁵⁸⁵. Identification of the most relevant and valuable data will take place in consultation between the Commission, stakeholders and authorities, driven by the SPI sustainability and circularity objectives. It would be based on underlying principles set out in the European Strategy for Data and the Data Governance Act and would make use of the relevant Common European data spaces⁵⁸⁶. Federated cloud services supporting the Common European data space infrastructure could implement the acquired levels of data sovereignty and provide the necessary guarantees to public and private data providers that reuse conditions and access limitations are being enforced on their data. It would be important to develop the EU DPP concept and design also looking at what is happening at international level, for example in the context of the ongoing work in UNEP, UNECE, OECD and the World Business Council for Sustainable Development. If designed and developed through an open dialogue with international partners (for example on technical standards, classifications and agreements on data sharing), it may help removing trade barriers, lowering investment costs, compliance costs and marketing costs.

⁵⁸⁴ Green Claims initiative, the revised of the Construction Product Regulation, Farm to Fork, Carbon Border Adjustment Mechanism, etc.

⁵⁸⁵ Digital inclusion is an EU-wide effort to ensure that everybody can contribute to and benefit from the digital world. The EU is fostering digital inclusion through several policy areas, including digital skills and social inclusion. <https://digital-strategy.ec.europa.eu/en/policies/digital-inclusion>

⁵⁸⁶ A Dataspace for Smart Circular Applications is foreseen in the European Data Strategy as part of the European Green Deal Dataspace, and linked to the Manufacturing Dataspace.

The legal entity putting the product on the EU market would be responsible for the provision, accessibility and accuracy of the required data in relation to that product. That entity should ensure that its suppliers make available and accessible required upstream data either directly (e.g. via an identifier on a component), or to the final producer, who can then provide a link to the source data via the unique identifier on the final product.

Ideally, the EU DPP should be based on a cascading / recursive process, whereby the EU DPP of the final product contains the link to the Unique Identifiers of each of the parts, and hence to their respective EU DPPs, which can then provide access to the EU DPPs of their own parts and materials. However, the feasibility of this comprehensive approach, or the need to implement a more simplified one, will be assessed on a case-by-case when developing SPI measures.

In principle, the EU DPP should be able to host both static data (unchanging, persistent and not for modification) and dynamic data (periodically updated as new information becomes available). Dynamic data might include performance data where relevant and possible⁵⁸⁷ (for example for electronic equipment), recording periodically the functionality and efficiency of the product or its components. The use of dynamic data would automatically require a full serialisation of the EU DPP, meaning that the specific passport would need to be available for each item placed on the market. The relevance and feasibility of including dynamic data in the EU DPP of a specific product group will be assessed when developing SPI measures at product-group level.

Subsequent to placing on the market, event or transactional data may be added (for example to indicate a new owner, replacement of a part, servicing or second use) if this is identified as important when SPI measures are developed. Provision of this data may not be mandatory, as compliance would be difficult to enforce in most cases; however, the experience of voluntary schemes has demonstrated that stakeholders do often find benefit in providing such data, for example to verify the identity and authenticity of a product or better estimate its residual market value. Such voluntary initiatives are still not available in many sectors or open to all actors; therefore there would be potential benefit in providing access to certain data of this type via the EU DPP. The entity initially putting the product on the market would not be responsible for any data introduced afterwards by third parties. In the case of a remanufactured product being put on the market again with a warranty, provision of this data would normally be mandatory and the responsibility of the remanufacturer.

Contacts with a number of privately established and voluntary product passports indicate that the parallel existence of the EU DPP, with requirements for a unique identifier and with data protocols and standards, will help them by ensuring wider data compatibility, interoperability of systems and roll-out. It would also be likely to lead to further voluntary sectoral initiatives. Nevertheless, data provided in the context of such initiatives is not considered as forming a part of the EU DPP and would not be accessed via the EU DPP. The EU DPP will on the one hand be able within its scope to require access to data that would otherwise not be made available via such sector initiatives, and on the other hand, outside of its scope, facilitate the interoperability and wider roll-out and application of these sector initiatives. The distinction between the EU DPP and data derived from other initiatives would be clear to users.

⁵⁸⁷ And in compliance with existing rules on the protection of personal data

The Policy Context and Mandate

With the European Green Deal (EGD), the European Commission has committed to taking ambitious action on climate and environment-related challenges. The EGD is a concerted growth strategy for a climate-neutral, more resource-efficient and competitive European economy.

The digital and green transitions are closely linked and interdependent. They will require new products and services, markets and business models, which must be grounded in European values and our social market economy. Digital technology and solutions (e.g. low energy computing, smart energy-, traffic- and resource management systems, efficient communications equipment and infrastructure) can reduce emissions and improve efficiency and circularity across all sectors. But digital technologies can just as easily be used to accelerate linear, unsustainable production and consumption systems. Therefore a clear policy framework is needed to ensure that their potential is harnessed towards public good and environmental sustainability across all sectors.

To restart Europe and to build long-term resilience, the European Union has decided to invest EUR 750 billion in recovery and resilience of the Member States under NextGenerationEU. Each Member State has committed to spending at least 20% of their recovery and resilience funds to foster digital transition and 37% to speeding up the green transition.

European Policy on Data

Transforming the internal market, underpinned by the free movement of goods, into a data-driven internal market, calls for the use of a common language to exchange information on products. The value of data lies in its use and re-use. Improving data use requires discourse between the data holder and the (potential) data user, but also depends on the nature of data involved. That value can lead to data hoarding, but availability of data is often essential for the public good, for health, fighting crime and of course environmental protection.

The EU DPP will, on the one hand, reflect the identified need to better exploit the increasing amount of data related to products. As President Von der Leyen stated in her State of the Union speech of 2020: *“The amount of industrial data in the world will quadruple in the next five years - and so will the opportunities that come with it. Though up to date 80% of industrial data is collected and never used”*. On the other hand, it will ensure that it is exploited for the public interest. The European Strategy for Data⁵⁸⁸ sets out the principles for a European approach to data, where *the data collection and use must place the interests of the individual first, in accordance with European values, fundamental rights and rules. Further the increasing volume of non-personal industrial data and public data in Europe, will constitute a potential source of growth and innovation that should be tapped.”*

Moreover, the forthcoming Data Act⁵⁸⁹ (Q4/2021) will “clarify the rights and obligations of parties in data transactions and ensure fairness in the allocation of data value among the actors

⁵⁸⁸ Brussels, 19.2.2020 COM(2020) 66 final

⁵⁸⁹ Inception Impact Assessment https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13045-Data-Act-&-amended-rules-on-the-legal-protection-of-databases_en

of the data economy”⁵⁹⁰. It has explicit objectives to incentivise sharing and using of B2B data and preventing unfair terms and conditions that may prevent other businesses from developing and flourishing.

European Policy on Circular Economy

The Circular Economy Action Plan defines a circular economy as "where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised". This has been explained as making the European economy less like a river, with materials flowing in at one end and emissions and waste out at the other, and more like a lake, where resources are exploited continually and optimally. Many of those resources are embodied in products, and therefore prolonging product life and optimising product use are essential to value retention. For that reason the new Circular Economy Action Plan (CEAP)⁵⁹¹ establishes the sustainable product policy and Sustainable Product Initiatives. And as the physical and digital worlds come closer, the value of products is increasingly bound up in the data linked to them.

Both the European Green Deal⁵⁹² and the new CEAP identify the European Digital Product Passport as a way to contribute to an effective product policy. The European Council identified this potential and urged the European Commission to bring forward a proposal and launch pilots for a European digital product passport in value chains identified in CEAP⁵⁹³. Funding opportunities to test the EU DPP concept in three key value chains will be available as part of the Digital Europe Programme in November 2021.

A concept similar to the EU DPP has already been proposed in EU legislation. The proposal for a Regulation on Batteries⁵⁹⁴, published Q4/2020, introduces a “battery passport” for introduction in 2026 as a means to provide information about the basic characteristics of types and models of electric vehicle and industrial batteries placed on the market. It will allow accredited economic operators to gather and reuse data on individual batteries placed on the market, to increase efficiency, create more value and to make better informed choices in their planning activities. It also establishes categories of data that must be more openly accessible and protected data relating to compliance.

Potential stakeholders’ benefits

⁵⁹⁰ Margrethe Vestager, Executive Vice-President for a Europe fit for the Digital Age

⁵⁹¹ COM(2020) 98 final

⁵⁹² COM(2019) 640 final

The European Green Deal notes that “*Digitalisation can also help improve the availability of information on the characteristics of products sold in the EU. For instance, an electronic product passport could provide information on a product’s origin, composition, repair and dismantling possibilities, and end of life handling*”.

⁵⁹³ *Eco-innovation: enabling the transition towards a circular economy*, Council Conclusions 15811/17, 18 December 2017; Council Conclusion on *Digitalisation for the benefit of the environment*, December 2020.

⁵⁹⁴ COM/2020/798 final: Proposal for a Regulation of the European Parliament and of the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020

The Business Case

The EU DPP comes with a strong business case associated to it; there are already several examples of similar voluntary initiatives (e.g., Global Battery Alliance⁵⁹⁵, WBCSD pathfinder⁵⁹⁶, Circularise⁵⁹⁷, Product Circularity Datasheet developed by the Luxembourg Ministry of economy⁵⁹⁸), however these lack the underlying public interest objective or the convening, arbitration and regulation power of the EU DPP initiative. Industries in all sectors would benefit from the EU DPP's existence as it would support value retention of materials and products, creating the conditions for the flourishing of new business models and new companies creating value from the information made available through the passport (as it is happening with many start-up companies active in the area of food and health). Key benefits for businesses stemming from the Digital Product Passport being led by EU public authorities lie in providing a clear business case for investment in the underlying infrastructure: (1) the interoperability of the system's components ensures a consistent use of IT infrastructure and investment through all value chains; (2) the synchronisation of the deployment of the DPP under a public and shared calendar enables the timely allocation of resources to investment, ensuring that the surrounding and supporting infrastructure will be implemented coherently by all business partners at the same time; (3) the mandatory nature in the EU Internal Market of the underlying technical standards ensures that the investment in the IT infrastructure will be useful, and avoids the risk of it remaining as a stranded asset and (4) a level playing field in respect of minimum data requirements, based on a consultative process and with legislative force.

The European digital product passport may bring multiple benefits to all actors of the value chain. Several private sector voluntary product passport initiatives already demonstrate a clear business case for product identification and data access, without the additional capacity of regulatory approaches to ensure scale, interoperability, inclusivity, public interest objectives and common open standards and a level playing field. These voluntary initiatives already provide a clear proof of concept, demonstrating that an EU DPP could:

- Allow tracking of **raw materials extraction**, supporting due diligence efforts by mining companies located around the world, recognising the efforts of the best and opening up market rewards. The advantages of a secured tracking system could equally benefit activities related to use of agricultural products or raw materials⁵⁹⁹ used by the apparel industry⁶⁰⁰(e.g. cotton).
- Benefit **manufacturers** allowing the creation of digital twins⁶⁰¹ of products⁶⁰², embedding all the information required either by legislation (e.g. chemical composition) or by customers in B2B transactions, and enabling predictive

⁵⁹⁵ <https://www.globalbattery.org/battery-passport/>

⁵⁹⁶ <https://www.wbcd.org>

⁵⁹⁷ <https://www.circularise.com/>

⁵⁹⁸ <https://pcds.lu/>

⁵⁹⁹ [Transforming the mineral supply chain with blockchain technology | Minespider](#)

⁶⁰⁰ [TrusTrace – Traceability as a Service, EON | CircularID Protocol | Connected Products \(eongroup.co\)](#)

⁶⁰¹ A digital twin is a virtual representation of an object or system that spans its lifecycle, is updated from real-time data, and uses simulation, machine learning and reasoning to help decision-making

⁶⁰² For example, The solution of the 'digital twin' is the solution foreseen in the Anti-Counterfeiting Blockathon project developed by the EU Intellectual Property Office (EUIPO). This on-going pilot project aims to design a blockchain-based infrastructure that will help authenticate products (use of a 'digital twin') and exchange data between all actors involved in the supply chain (involvements of law enforcement authorities and consumers are still foreseen as optional at this stage). This blockchain-based infrastructure would be integrated with (i) track and trace systems, (ii) the EUIPO IP Enforcement Portal and (iii) the EUIPO 'IP Register on blockchain' blockchain-based project.

maintenance. Where appropriate and useful the DPP could also include dynamic (and product-generated and geo-specific) data, as well as static data. Implementing traceability of components and products at the scale of the batch or of the individual item throughout the supply chain enables transparency, from basic material processing and refinement, to the on-the-shelf product, then to recycling. Traceability has facilitated warranty claims and recalls⁶⁰³, and allows OEMs to zero in on the suppliers, component batch, and the specific process step that has led to a particular defect. This traceability is also a key enabler of a circular economy and supports the anticounterfeiting measures of OEMs⁶⁰⁴. In addition, traceability helps to control the production process by establishing the link between any potential product flaws and the precise set of parameters used in the manufacturing process⁶⁰⁵.

- Generate **new business opportunities** and models by facilitating transactions along value chains, reducing friction costs and enabling effective operation of markets for products during their lifetime. For example it is expected that once the efficiency of electric vehicle batteries is too low for mobility purposes, they will more optimally be used for energy storage. Identifying the point at which this stage is reached, and the market price based on existing and predicted performance will rely on access to static and dynamic data⁶⁰⁶.
- Track the life story of a product, enabling services related to its **remanufacturing, reparability, second-life, recyclability**, new business models, and better management of its final disposal when needed.
- Facilitate **collaborative business models** such as “products as a service”, peer-to-peer sharing and leasing, by enabling relevant technical data on use and performance to be attached to the product.
- Facilitate **compliance with non-financial reporting** for the 60-70,000 largest companies in the EU, that will be obliged to demonstrate alignment with the EU taxonomy regulation⁶⁰⁷, including in relation to circular economy.
- Benefit **market surveillance and customs authorities**, by making available the information they need to carry out their tasks efficiently and effectively.
- Support **financial services** – better product information implies lower risk and higher potential for value retention, benefiting producers and their buyers by impacting insurance calculation, valuation, financing etc. The EU DPP should facilitate proof of alignment with the taxonomy, thereby enabling access to green financing funds.

The Consumer Case

The EU DPP concept does not intend to replace the information provided to consumers on printed labels. This is particularly important for the digitally excluded. It will rather

⁶⁰³ [European Rapid Alert system for dangerous products \(RAPEX\) | Joinup \(europa.eu\)](#)

⁶⁰⁴ [TrueTwins](#)

⁶⁰⁵ “Industry 4.0 - Capturing value at scale in discrete manufacturing”, McKinsey July 2019

⁶⁰⁶ [Establishing a sustainable and responsible battery value chain - Global Battery Alliance](#)

⁶⁰⁷ [Regulation \(EU\) 2020/852 on the establishment of a framework to facilitate sustainable investment](#)

complement this information and be more permanently available than tags or packaging that are removed after purchase.

The EU DPP will allow consumers to have access to relevant and verified information related to the characteristics of the products they own or are considering purchasing/using and therefore to make more informed and sustainable decisions.

However, it is already challenging for consumers to process and analyse the existing levels of information they receive. The EU DPP framework will also facilitate the provision of services to consumers (e.g.: product comparison apps), based on verifiable sustainability data. These could be provided by consumer associations, retailers, NGOs or private actors. Such services would of course need to be in full compliance with EU data protection rules, and the fairness of such services when marketed towards consumers would be ensured via the requirements to be introduced under the initiative on Empowering Consumers for the Green Transition.

The EU DPP will enable enhanced possibilities to resell products, based on accurate product data (e.g. on the maintenance and repair operations, and their compliance with the quality requirements set by the OEM), increased buyer confidence and reduced market friction. It will also open up enhanced possibilities to buy pre-owned products with confidence.

It will also open up access to “products as a service” such as renting and peer-to-peer lending, enabling use of products without the upfront purchase costs and subsequent servicing.

The information made available through the EU DPP could enable consumers and other economic actors to make better-informed and more sustainable decisions on the basis of clear, actionable data accessible via the passport. Although consumers would have direct access to an increased amount of data, this could not automatically translate into more informed decisions as there would be the risk of an excessive amount of information dumped on the user. To address this risk, the EU DPP is designed in a way to foster innovation also by enabling third parties (consumer associations, NGOs, retailers, other companies) to develop applications to help consumers navigate and compare available products, and by providing tailored advice before purchase on the best economic and environmental choices. In conjunction with the measures to be taken under the initiative on Empowering Consumers for the Green Transition to ensure such services comply with certain fairness requirements when marketed towards consumers, this could boost the visibility and credibility of sustainable businesses and products.

The Government Case

The EU DPP should assist public authorities and policy makers at different levels in several ways, including:

- making available reliable information of key importance for monitoring of systemic sustainability-related impacts and **better policy design**;
- enabling the possibility of **rewarding sustainability** (e.g. taxation of use of primary raw materials as opposed to recyclates, preferential VAT rates on repair services) and inform work on future Ecodesign requirements;
- Providing a more comprehensive and evolving picture of resource stocks and flows, permitting **evaluation of strategic autonomy and risks** of supply shocks, and analysis of environmental and other impacts;

- Allowing a more accurate view of investment gaps and **planning of investments** to develop circular activities and jobs;
- Facilitate **Green Public Procurement (GPP)** - including by private purchasers that wish to follow the GPP criteria - by providing public purchasers with the information they need to integrate sustainability and circularity in their procurement criteria and strategies.
- Enable efficient monitoring and **enforcement** operations, the Commission, national competent authorities, and any designated external auditor through full access to the data contained in the European digital product passport.

Stakeholder Feedback and Recommendations

Based on the outcomes of the Open Consultation, a targeted stakeholder workshop organised in June 2021 and a number of bilateral interviews carried out with stakeholders involved in major initiatives involving digitalisation of information along value chains, the following general recommendations were identified:

1. A **decentralised/distributed system** would be more appropriate to the EU DPP developed under the SPI than a centralised one, given the broad scope of product groups and geographical coverage across the value chains. It would be very difficult to manage a centralised database with such a wide scope;
2. Bringing together and **building upon existing initiatives** when developing the EU DPP under the SPI. All existing relevant initiatives expressed a high level of willingness to cooperate and collaborate, both with each other and the Commission;
3. Companies expressed a **willingness to make data accessible** via a DPP, even where there is no direct benefit to them, if the public interest objectives and utility are clear.
4. The EU DPP needs an **international perspective and approach**, both in terms of development and application. This is because the value chain of the SPI will most likely cover partners outside the EU (e.g., in sourcing of raw materials and products). Therefore, a common understandable perspective and approach needs to be adopted, and sensitisation of extra-EU operators to comply with data requirements needs to be considered;
5. The EU DPP should be **based on open source systems, and ensure interoperability and access for everybody**;
6. Clarify and **harmonise the terminology used and standardisation applied**.
7. **Include social and environmental impacts**, both in the use phase and along the value chain.
 - Social aspects are considered as important, but they are often not included yet due to unclear agreements on which are the most relevant and how they need to be reported (according to which standard). This results in the potential to collaborate with Global Reporting Initiative (GRI) related to transparency at corporate level;

- It would be ideal to link the EU DPP with the Product Environmental Footprint (PEF) methodology in order to capture the environmental impact in a harmonised way.
- 8. Resolve potential resistance beforehand.** In order to resolve reluctance of European countries and companies, a special communication and training could help to sensitise and mitigate.
- 9. Confidentiality needs to be considered in the design phase** of the EU DPP already in order to develop a system that is compliant with data protection rules and enforces the data reuse and access conditions.
- The information must be purpose-driven: the purpose of the product passport should determine the information to be included in the passport. Therefore, mandatory information should be limited to what is relevant and necessary for the purpose. The product passport should include the minimum amount of data needed to fulfil the purpose in accordance with the data minimization principle. It is therefore important to identify the right and reasonable amount of detail so that information management is not overly complicated, energetically unsustainable and administratively burdensome.
 - To guarantee the authenticity of transferred data, third party/independent verification and the appropriate supporting technology of immutable data storage systems are needed. One solution to this issue could be to build on the work of the EU's European Block-chain Services Infrastructure (EBSI) project which has done a lot of work on the notarization of documents based on block-chain technology (basically registering electronic "fingerprints" of documents in the form of hashes);
 - Companies need to keep control of their data and be accountable for its accuracy. In fact, liabilities should be defined in the design phase of the product passport system providing clear responsibility and penalties in case of non-authenticity of transferred data. It is also important to control how data is shared and accessed in order to have a data sharing of personal and non-personal data, including sensitive business data that is secure and allows all stakeholders to have easy access to high-quality industrial data.
- 10. For the development, it is crucial to have IT developers and database experts on board.**
- The designers of the EU DPP data structure should be business analysts and IT developers. They should be able to develop a structure that can standardise data to avoid duplication, to maintain its reliability and limit the information storage space. Compliance with international data models (e.g.

EU customs Data Model⁶⁰⁸, WCO data model⁶⁰⁹) should be sought as much as possible.

- When drafting the wording in the legislation a database expert should review the wording, since non-rigorous technical wording could lead to ambiguities in the technical specification and to significant implementation difficulties later.

11. For the long-term implementation, consider to include independent parties to ensure trustworthiness.

- This could apply to the whole initiative, running it through an NGO, for instance;
- And to the gathering and ranking of information that would be done through an independent interface or intermediate in order to make it digestible for consumers.

12. For a user-friendly use in practice, an application that would recognise each link to the product (e.g. scan the data carrier and automatically lead consumer to the description of the product) would be the desirable option.

13. Facilitate an inclusive development of the application.

- The IT framework of the SPI should be inclusive for SMEs as well as importers;
- The EU DPP validation process should include the option to choose between different stages of (self-) auditing that includes a light version for SMEs;
- IP right owners might be an important party to include as they all increasingly aim to keep a closer relationship to their customers;
- The system developed should be geared to include and facilitate all verification that the EU decides to authorise.

14. The EU DPP should be correctly anchored in legislation in order to facilitate its operation and purpose.

- This would especially include to formally make it mandatory to disclose certain kinds of data relevant to ensure a clear, consistent and comparable EU DPP;
- There is also a need to make sharing of information mandatory this way to ensure transparency;
- In order to properly execute financial and environmental calculations on the product's impacts, more environmental aspects have to be made available. The same applies for schemes, formats and kinds of data related to (building and construction) products, which should be aligned across countries or the EU DPP should support all formats (which however, will require more capacity).

⁶⁰⁸ https://ec.europa.eu/taxation_customs/customs-4/union-customs-code/eu-customs-data-model-eucdm_en

⁶⁰⁹ <http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/data-model.aspx>

- For that information that should not be accessed by all publics for a good justification, legislation should define the conditions under which this information should be accessible in the DPP – who should have access, how to define and verify rights, possible fees or commercial conditions of access if justified, etc.

15. Examine in great detail if digital twins are necessary as such a system requires to have many companies across the value chain in different parts in the world to participate before you begin, which could sacrifice the chain of custody and breaks the whole system.

Coherence with ongoing initiatives

There are a number of policy activities and developments within the timeframe of SPI which are closely related to the EU DPP, others will inform the further development of the EU DPP and specific DPP.

The **proposal for the Battery Regulation**⁶¹⁰ introduced the concept of a **battery passport** (and database). By January 2026, manufacturers, importers and distributors of industrial and electric vehicles (EV) batteries would be required to have a unique digital passport for each individual battery (identified through its serial number) placed on the market. It would consist of a combination of static information (fixed at the moment of placing the battery on the market) and dynamic data generated throughout its use to facilitate reuse and refurbishment⁶¹¹. By that date the European Commission shall also set up a battery information database consisting of a public part (B2C) accessible after purchase, a restricted part (B2B), a compliance part (B2G) and an online portal giving access to those three parts.

In a similar way, the European Commission is working towards the establishment of a **digital building logbook**. A study⁶¹² identified business models, key points for good practice with respect to usage, data management and digitalisation of building logbooks. The digital logbook will probably host both static and dynamic information. In addition work is ongoing towards the revision of the **Construction Products Regulation (CPR)**. It could possibly address the issue of the digitalisation of the CE marking system for the products in scope.

In order to gather insights, test practicability and inform future legislation, a call for “**a digitised, resource-efficient and resilient industry 2022**“ as part of **HORIZON Research and Innovation Actions** was published. The proposal should cover critical raw materials in at least five complex supply chains, including batteries value chain.

And a call for an eighteen month’ **Coordination and Support Action** under the Digital Europe Programme (2021) will be launched in November 2021 **piloting three European digital product passports** in the areas of batteries, electronics and one other key value chain of the CEAP. This pilot will be carried out in close cooperation with industry and businesses.

⁶¹⁰ COM(2020) 798/3

⁶¹¹ Full requirements are contained in Annex XIII of the Regulation

⁶¹² [Study on the development of an EU framework for Digital Building Logbooks | Internal Market, Industry, Entrepreneurship and SMEs \(europa.eu\)](https://ec.europa.eu/study-on-the-development-of-an-eu-framework-for-digital-building-logbooks/)

The upcoming initiative on **Empowering Consumers for the Green Transition** will introduce certain fairness requirements for sustainability information tools (e.g. apps). These requirements will ensure the transparency of such tools when marketed towards consumers by traders. This will be an important safeguard to ensure that the expected proliferation of such services as a result of the increase in product sustainability information provided by the EU DPP will not lead to consumers being provided with misleading or unreliable information.

B. THE EU DPP FRAMEWORK

Examples of possible design principles

All the design requirements presented below are illustrative examples and should not be understood as a final decision on any of the technical details. Such decisions will be taken based on the outcomes of existing and future pilot experiences, consultation with stakeholders, and dedicated impact assessments.

Functional requirements of the European Digital Product Passport

The European Digital Product Passport should comply with the following general requirements:

- A unique identifier (data carrier) links the product with the data contained in the European digital product passport;
- The data present on the EU DPP remains available even after the bankruptcy, the liquidation or the cessation of activity in the EU of its originator;
- Its content is written in an open, standard, inter-operable format;
- This standard is usable under open licences or under Fair, Reasonable And Non-Discriminatory (FRAND) legal and economic conditions;
- This standard is usable over very long periods of time;
- The EU DPP (and its content) is machine-readable;
- The content of the EU DPP is searchable;
- The rights to access and modify information are controllable;
- The access to information is on a “need-to-know” basis;
- The author of the information is authenticated;
- The reliability of the information is assured;
- The integrity of the information is assured.

The **Unique Identifier** of the product, which connects it to the content of its European Digital Product Passport, is physically linked to the product. The type of data carrier and its placement is defined at the level of SPI measures as it depends on the characteristics of the product group.

The data contained on the EU DPP remains **accessible** as long as the product that it refers to, and the materials that this product is made of, are present in significant numbers on the territory of the European Union. This data is indeed needed for maintainers of the products,

for repairers and ultimately for recyclers. This period of time when data on the product is necessary for third parties may last years, or even decades, after the product was manufactured, and an even longer period of time after the product was placed on the market. This holds specifically for long-lived products and materials such as those in the construction sector, but is valid for all products, particularly in circumstances where the SPI will be implemented and will have delivered on its policy goal of increasing product lifetime.

It is possible that the company having manufactured or imported the product in the EU Internal Market disappears (because of bankruptcy or in case of liquidation), or has ceased operating the EU, before the end of the period in which the data should remain available to third parties.

It is thus necessary to ensure the availability of this product-related data on the European digital product passport infrastructure to the third parties needing it, over the time period when it is needed even in the cases mentioned above (bankruptcy or liquidation of the data originator, cessation of its activities in the EU).

The European digital product passport contains information on a product that supports:

- Operators along the supply chain to consolidate (a) the data received from their suppliers on the environmental and social impacts of their input and (b) the environmental and social impacts of their own operations into a figure (for each category of impacts) ready to be transmitted to and used by their own customers, and (c) the data received from their suppliers on the environmental and social impacts of their input (if relevant and appropriate);
- operators along the supply chain to perform their work efficiently in terms of natural resources and energy and of economic value, specifically as regards value-retaining operations (maintenance, repair) or value-restoring operations (refurbishment, upgrade, retrofit, recycling);
- final consumers in their purchasing decisions towards higher environmental and social sustainability of products;
- market surveillance and customs authorities.

There is a significant risk that each of these players use a different, incompatible technical system to store product data, so that the policy objective of having the information transmitted along the value chain be missed. As a consequence, the issue of **standardisation**, at the detailed level of **inter-operability** of the storage and transmission of data, is an essential feature of the European digital product passport.

This inter-operability should exist on all levels:

- Technical on the addressing space, the item (or batch) identifier, the data format and the metrology measurement units, the communication protocol;
- Semantic on the meaning of each element of data, to guarantee common understanding through the value chain, exchangeable formats, unique identifiers for product categories, materials, services, common API's, common federation services (authorisation, authentication, accounting, transformation, etc.), shared data models.

If a private company or a public body external to the European Union were to hold a monopolistic grip on the Intellectual Property underlying the standards defining a product passport, so that this standard be proprietary, it would extract a potentially considerable

economic rent from the fact that this product passport would be of universal and mandatory use across the whole European Union. It would in addition be in a position of exerting pressure on all economic players in the EU non-food manufacturing sector. Because of the nature and the magnitude of this risk of having the standard for the European digital product passport being proprietary, we consider that the standards for a Product passport should be available under **open licences** such as those produced by the Internet Engineering Task Force (IETF)⁶¹³ or under **Fair, Reasonable and Non-Discriminatory (FRAND)** economic and legal conditions.

In view of the need for data to be available for a long period of time, the standard used to write the information on the European digital product passport and the system to retrieve the information must be **stable** over a long enough period to enable it to be retrieved and interpreted at the end of life of the product (see the section on “permanency of URL” for further considerations on this issue).

In addition, the standard should be able to **evolve** over a long period of time, while maintaining backward compatibility with all previous versions since the start of the implementation of the EU DPP.

Similarly, **access** to the relevant **information** along the value chain should be fast and accurate, exploiting the potential of new technologies and building on the numerous apps already existing on the market able to read unique identifiers, so as to enable **automated** treatment, e.g. in the following usage scenarios:

- Verification of the sustainability claims and of their authenticity;
- Testing, dis-assembly, diagnostic, maintenance, repair, refurbishment;
- Detection of the presence and of the location of substances of concern;
- Consumers’ and procurers’ access to sustainability and circularity related information, including prior to purchasing the product in question;
- Market surveillance and customs’ operations;
- Sorting of materials upon recycling.

This would call for the information to be **machine-readable**.

The information present on the EU DPP is susceptible to grow to large proportions, specifically if information is collected and tracked along complex value chains with a large number of modules and components involved. In order for this information to be usable in practice, the EU DPP needs to be **searchable**.

The information contained in an EU DPP could be potentially very comprehensive for the sake of maintenance, repair or re-manufacturing – but also therefore **confidential**, at least during the period of time when the company is actively supporting the product. For this reason, the European digital product passport should enable access to information on a “need-to-know” basis, with the exception of market surveillance, customs authorities and the Commission who should have access to any information, at their discretion, and without

⁶¹³ <https://www.ietf.org/about/mission/>

needing the consent of the originator of the data. This is without prejudice to EU data protection rules regarding the processing of personal data.

The author or authors (legal or physical person) of an information written on a European digital product passport bears **responsibility** for this information. This is true for information related to the sustainability features of the product, which, in the framework of the implementation of the Sustainable Product Initiative, will acquire economic value: products that are more sustainable are likely to be sold with a price premium⁶¹⁴. It is also true for information related to maintenance or recycling, for which false information creates harm to the user of that information (e.g. because it reduces the purity, and hence the quality, of the recycled material).

Thus, the European digital product passport should contain means to **authenticate** the author of each information item written, so that this author be clearly identified, cannot repudiate having written the information, and thus bear full responsibility for this information. As regards the fairness of voluntary environmental claims made towards consumers, any misleading claims will be subject to enforcement measures foreseen under both the initiative on the Empowering Consumers for the Green Transition and the Green Claims Initiative.

Information only has a value and can be used appropriately if it is true. The technical features and the institutional arrangements governing the generation of information to be stored on the European digital product passport should ensure that this information is true.

Information on the European digital product passport is susceptible to have economic value (e.g. when bearing on sustainability features of the product) or to cause harm if false, as seen above. It should not be modified illegitimately.

The European digital product passport should thus contain technical features that ensure the **integrity** and the **immutability** of the information that it contains, i.e. that make sure that the information, once written, cannot be modified without this change being duly recorded.

Building on existing practices, tools and standards

The design of the EU DPP has a deep impact on how it may contribute to achieve the SPI objectives of making available relevant information to different stakeholders groups. There are already existing EU databases (e.g. EPREL, SCIP, and many more) that include relevant information that shall be embedded and made available through the DPP.

The amount of information already existing and the objective of minimising any unnecessary burden for industries and governments suggest designing the EU DPP not as a centralised repository of information but rather as an interface allowing smart access to the information needed. This situation calls for building on what industry sectors have already been doing for many years when it comes to exchange of product-related information/data. During the preparatory phase and deployment stages, a close collaboration with the relevant stakeholders and feedback from existing similar private initiatives will be necessary to complement and fine tune the design framework.

⁶¹⁴ As it currently already is the case for organic cotton, which is sold at a 18% price premium compared to conventional cotton. See Textile Exchange – Organic Cotton Market Report 2020. https://textileexchange.org/wp-content/uploads/2020/08/Textile-Exchange_Organic-Cotton-Market-Report_2020-20200810.pdf

Any company who is producing, transferring, and/or selling products or components is already identifying products digitally with Stock Keeping Units (SKUs) and using digital solutions that carry some relevant information related to that product/component. The most used and known ones are the barcodes⁶¹⁵, the QR codes, data matrix, watermarks, RFIDs. These are some among the many existing “unique identifiers” (UI) used to digitally transfer information along the supply / value chain.

For example, in France half of manufacturers and 100% of fast moving consumer goods (FMCG) retailers automate the exchange of data by using Electronic Data Interchange (EDI). They electronically send and receive the documents forming the basis of their transactions in a predefined format. This automation has resulted, among other things, in the elimination of the costs related to paper, data that are more reliable and in the reduction of manual inputting.

The use of these unique identifiers relies on a number of standards for business communication that have been developed by multiple market actors, often building on, or evolving into, ISO/IEC standards. Company-specific (non-standard) additions should be avoided, as they add complexity and cost to the supply chain, as well as reducing interoperability.

The relevance of full value chain traceability

Materials (here referred to as traceable assets in this context) are utilized as inputs to processes that convert them into new and distinct traceable assets on a recurring basis. These outputs must also be tracked and connected to their inputs, so that when the client gets a finished product, all the inputs can be recognized — by tracing the chain's connections back to the start. Each step of the value chain requires the definition of traceable assets, as well as the definition and recording of the connection between traceable assets that are inputs and traceable assets that are outputs.

In order to work and be effective, an end-to-end track and tracing system require all components of the supply chain to be part of the system, without any derogation based on size or geographical location. To ensure the integrity of identifiers for traceable assets across the value chain and to validate additional traceability information, connections between identifiers for traceable assets, company identifiers, and physical location identifiers must be created.

While this encompassing approach (covering the full value chain), should be the default architecture for the EU DPP, it is also clear, that for specific products a case by case appraisal, including relevant stakeholders, is a necessary first step. This needs-based (modular) design will help a gradual deployment of the EU DPP concept.

In figure 2 an example of this concept for the textile and leather industry is shown.

⁶¹⁵ The Uniform Product Code Council, established in 1973 for the US market, created the first barcode standard to identify items in grocery stores. Now 47 years later, this standard is used worldwide on everything from medicines to shipping containers.



Figure 2 The main value chain stages for textile and leather products, parts and components⁶¹⁶

When tracing the possession and/or location of products, it is also critical to keep track of unique identifiers for logistical units. When traceable assets are aggregated (combined) or disaggregated for transportation reasons, a logistics unit is formed. Logistics units come in a variety of sizes, from boxes to pallets to containers.

Due to the complexity of the majority of supply chains, each participant must ensure that traceability data may flow in both directions (upstream and downstream). Systems must be able to support parties requesting data that may exist upstream or downstream of the organization. Standards for data identification, capture, and exchange already exist and they are critical to providing the necessary interoperability to connect the systems of the various parties.

Most of this information is already included in the unique identifiers currently in use. Implementation of the European digital product passport require a different set of actions depending on the level of maturity of the track and tracing system used by a company. In particular:

- If a company already has in place a track and trace system based on a unique identifier, the company will have to:
 - Align it to the different global open standards that will be listed and/or developed;
 - Integrate/interconnect their system into the overall architecture of the EU DPP;
 - Collect/calculate the specific information requested for that product group, as identified in the corresponding SPI measure adopted by the Commission;
 - Add the information to the unique identifier, filling in the corresponding data template;
 - Establish the persistent URL linking the product data to the unique identifier;

⁶¹⁶ Recommendation No. 46 : Enhancing traceability and transparency of sustainable value chains in the garment and footwear sector ; UNECE/TRADE/C/CEFACT/2021/10

- Send the information related to each newly created unique identifier (and the corresponding “track & trace information”) to the EU central registry.
- If a company does not have in place any track and trace system, then it will also have to set up the IT system components, interfaces, infrastructure, and procedures.

Possible technical and institutional arrangements enabling the fulfilment of the functional requirements

Table 100 provides a list of features that could be included in the design of the European digital product passport. The subsequent paragraphs provide further details and some preliminary considerations on possible choices to be made. However, the decision on the detailed design of the EU DPP will only be taken in secondary legislation, based on dedicated impact assessments and thorough consultation with stakeholders.

Table 100 Examples of technical and institutional arrangements to fulfil the functional requirements placed on the European digital product passport

| Feature | Solution proposed |
|--|--|
| A data carrier links the product and the data contained on the European digital product passport | Use of a multi-functional unique identifier, meaning a data carrier that includes a persistent URL |
| The unique identifier is available at the right level of granularity | The SPI measures would define, for each product group, what is the right level of granularity required for the unique identifier(s) (item level, batch level, class level) |
| Its content is written in an open, standard, inter-operable format | Mandatory usage of a single set of standards defining the technical and semantic aspects of inter-operable, end-to-end communication and data transfer |
| This standard is usable under open licences or under Fair, Reasonable And Non-Discriminatory (FRAND) legal and economic conditions | The Intellectual Property Rights included in the standard are made available for all players to be used under conditions recognised as FRAND, such as those of the IETF ⁶¹⁷ of ETSI ⁶¹⁸ or of CEN/Cenelec ⁶¹⁹ |

⁶¹⁷ IETF, “Rights Contributors Provide to the IETF Trust”, RFC 5378, 2008, <https://datatracker.ietf.org/doc/rfc5378/>

⁶¹⁸ ETSI, “Intellectual Property Rights policy”, 2020, <https://www.etsi.org/images/files/IPR/etsi-ipr-policy.pdf>

⁶¹⁹ “CEN and CENELEC position on: Standard-Essential Patents and Fair, Reasonable and Non-Discriminatory (FRAND) commitments”, 2016, https://www.cencenelec.eu/News/Policy_Opinions/PolicyOpinions/EssentialPatents.pdf

| | |
|---|---|
| <p>This standard is usable over very long periods of time</p> | <p>Evolutions of the standard are backward compatible over a duration depending on lifetime of products (per product group).</p> <p>The standard contains provisions for an indefinite number of evolutions.</p> |
| <p>The EU DPP introduce a set of information common to all products and product-specific information</p> | <p>Distinction between “track & trace” information and “attributes”</p> |
| <p>The content of the European digital product passport is automated</p> | <p>The multi-functional unique identifier includes a persistent URL that links the attributes included in a data carrier to information laced in a product-specific web page.</p> |
| <p>The content of the European digital product passport is machine-readable</p> | <p>Information could be stored as text and numbers. Each information item could be accompanied by meta-data describing the nature of the data</p> |
| <p>The content of the European digital product passport is searchable</p> | <p>Several options are possible, like for example the use of apps allowing to search for any information</p> |
| <p>The rights to access and modify information are controllable</p> | <p>Each participant in the system is assigned a role. The granting of a role is controlled by the operating authority. Each role has a differentiated set of access rights.</p> |
| <p>The access to information is on a “need-to-know-“ basis</p> | <p>Different groups of stakeholder would have access to different information included in the EU DPP. The specific access rights will be identified when developing product-group specific SPI measures.</p> |
| <p>The data present on the European digital product passport remains available even after the bankruptcy, the liquidation or the cessation of activity in the EU of the economic operator placing the product on the market</p> | <p>Each economic operator who will have to produce an EU DPP could set up a technical back-up data repository, managed by an independent third-party service provider, subject to specific rules regarding technical security and financial sustainability. Periodic replication of the data contained in the Digital Product Passport into that back-up data repository is mandatory. The URL enabling access to the technical back-up repository shall be transmitted to the Resolver and the central registry.</p> |
| <p>The author of the information is authenticated</p> | <p>Usage of existing identity management solutions (e.g. evolution of eIDAS).</p> |

| | |
|---|--|
| The reliability of the information is assured | Third-party independent verification could be required for the most relevant data points. Specific verification requirements will be identified at product-group level |
| The integrity of the information is assured | Data integrity would be part of the design process of the system. |

A single set of standards

There are significant advantages in having the European Union mandating the use of a single set of technical standard ensuring inter-operability of data transmission along the value chain and the product life-cycle. By doing so, the EU would reach simultaneously several policy goals:

- provide an essential infrastructure for the propagation of sustainability information along the value chain and for the industrialisation of circular value-retaining or -recovering operations (maintenance, repair, re-manufacturing, refurbishing). This would lead to an increase in the reliability and efficiency of these operations, an improvement of their quality and a reduction of their cost – leading to better acceptance by manufacturers and consumers alike of the Sustainable Product Initiative;
- give a synchronisation signal to all players in the non-food industrial value chains (thereby avoiding the "penguin effect") to implement a common, interoperable, open communication infrastructure for the reliable transmission of messages along the whole non-food industrial value chain, while assuring FRAND economic conditions for all players to use it. This would provide EU-based industrial companies with a first-mover advantage in the market of the Industrial Internet of Things, by being the first to enjoy the benefits of such a comprehensive communication infrastructure.

The European Union has achieved already, at least once, the political and technical ambition of mandating by law – and of implementing in practice – the unification of the standards defining the interoperability of a large digital system within the EU: the GSM standard⁶²⁰.

A straightforward means to have a standard being developed to support EU legislation on the Internal Market is to mandate the European Standardisation Organisations (ESOs), namely CEN, Cenelec and Etsi, to develop one, as per the New Legislative Framework⁶²¹. This mandate should build on the work already done by existing work of international standard-setting organisations (e.g. GS1) and complement it on any missing part.

There is a risk however that this international standard-setting work be overly delayed by conflicts between corporations defending competing solutions. This delay could significantly limit the benefits of a European digital product passport. It would additionally increase the risk of digital monopolists taking advantage of the standardisation and legal vacuum to

⁶²⁰ <https://www.3gpp.org/specifications/gsm-history>

⁶²¹ The new legislative framework consists of:

- [Regulation \(EC\) 765/2008](#) setting out the requirements for accreditation and the market surveillance of products;
- [Decision 768/2008](#) on a common framework for the marketing of products;
- [Regulation \(EU\) 2019/1020](#) on market surveillance and compliance of products.

attempt imposing their proprietary systems *de facto*, under arguments of speed and of lower costs, but with important drawbacks in terms of fragmentation of the Internal Market, of cross-sectoral inter-operability and of capture of industrial value added by these digital monopolists.

Typology of unique identifiers

The typology of data carriers used (barcodes, 2D identifiers, watermarks, data matrix, RFIDs, etc) shall be compatible with different typology and number of information that the passport carries on. Linear data carriers, like barcodes, are probably not adequate for the scope due to the limited amount of information they can support.

In order not to hinder future technological innovations, rather than prescribing a specific data carrier, it could be preferable to identify the specific objectives and functionalities the EU DPP would provide and let companies and value chains who have developed their own solutions to adapt the existing carriers to the specific interoperability requirements of the European digital product passport, and specifically to link it explicitly to the Unique Identifier that could be the entry point to the EU Digital Product Passport infrastructure. In particular, a **multi-functional data carrier solution** could be suggested. It is an entry point for a network of connected information and services. This single point of entry is used by a variety of apps that meet business-to-business and business-to-consumer needs through the usage of open or access-controlled resources. In this way companies already using any data carriers (but barcodes for the reason explained above) would be able to continue using them, adapting certain features to the DPP needs and design.

Multi-functional data carriers

Barcodes and other data carriers have historically served as a point of reference to link information about the designated object certain item to information stored in a computer. This, usually in a web page. This means that the link the data carriers establish is not to a product but to a web page. Moreover, this is often restricted to data kept on the computer or computing infrastructure to which the scanner is connected.

As a result, manufacturers frequently need to aggregate data, which means creating a local copy of a combination of master data, data managed by other business partners (including supplier traceability information), information made available to regulators, information for customers (websites, apps), etc. This typically requires data to be harmonised in some form and controlled through a centralized mechanism, with the consequent need for human and other resources and risks of mistakes.

However, a new alternative approach to this traditional way of linking data carrier, consists in **linking the data carrier to a specific product**. These multi-functional data carriers bring together the World Wide Web (through a persistent URL) with existing data carriers like QR codes, RFID, watermarks, data matrix, etc. They provide a standard way of expressing the attributes included in a data carrier in a format that can be used on the web through a persistent URL. This connects scanned items to an infinite number of data sources, whether kept locally or remotely, regardless of who manages them. The presence of a multi-functional data carrier, enables to use a single API to access many locations on the Web, making it simple to search for information on one specific thing.

The use of multi-functional data carriers has several benefits, like:

- Data carriers and other symbols occupy less space on the pack,
- The lower number of data carriers reduce the risk of confusion for consumers,
- Mobile phone users do not have to install a specific app in order to obtain certain types of information, therefore not requiring the use of multiple apps.

This practically means that the use of persistent URL can assist in overcoming semantic interoperability conflicts and providing cross-border services to citizens and businesses, thereby supporting the Single Market and the mobility of people, information, and goods in the EU.

How to search for information stored in the EU DPP

The EU DPP will include different elements of information related to different life cycle stages and characteristics of the product (environmental, social, technical circularity, legal compliance, supporting information, instructions, etc).

In order to help the users to navigate through this potentially wide and dispersed amount of information, it is necessary to find ways to structure the information and simplify its searchability.

It is expected that third party service providers will develop tailored solutions for different users to implement the search functionality. As for many other technical specifications, the intention is not to impose a one size fit all solution but rather to identify the objective and design a system that is flexible enough without undermining the overarching objective of a full interoperability.

An example of a technical solution to provide the search functionality is based on the so-called resolvers. A resolver is a system that saves the web address of the information an economic operator shall (or want) make available to the different stakeholders. Typically, the data themselves are not saved on the resolver, which simply redirects requests to the location where the required data are stored.

Resolvers may provide hyperlinks to a variety of resources. Some will be readable by humans, while others will be machine-readable. Certain links will take the user to public resources, while others will require authorization (see section on access rights).

There are at least two possible options for the identification of resolvers in the context of the European digital product passport implementation: a centralised approach and a decentralised one.

A **centralised** resolver has the following advantages:

- a) There is no dispute about where an application should look for information about a certain item.
- b) It minimises the replication of data.
- c) It makes the data immediately available to all interested parties, with no potential incoherence due to the slow propagation of location of data among different Resolvers
- d) Technical replication and mirroring avoid single points of failure.
- e) It allows verifying that every data discovered via a unique identifier links to brand-authorized data.

A **decentralised** approach has the following advantages:

- a) A resolver can be run by anyone. This includes brand owners and solution providers, all of which are free to operate the service according to their own policies.
- b) From an engineering standpoint, the presence of several resolvers avoid the possibility of a single point of failure. Additionally, if a resolver is unable to respond to a particular query, it might forward the request to another service.

Based on the prevailing opinion of the stakeholders consulted, the experiences with centralised databases, the minimisation of costs related to new IT infrastructure needed, and the overall philosophy of the European digital product passport of being an “entry gate” to information often already available, it would seem preferable, rather than centralizing data, to design the European digital product passport as a tool enabling routing queries to the location of the required data.

Multi-function data carriers in action, the example of jeans

To access the requested information the user needs to use one of the many already existing smartphone applications or another suitable scanner device (like those available in many retailers). The app scans the data carrier used on the item, creates a web link starting from the information returned by the scan (persistent URL) and then contacts the resolver, which redirects to the web page where the information is stored. Link types should not normally be included in data carriers. It is an application that adds the request for a specific “link type” before resolving the identifiers. One of the underlying assumptions is that each item has its own dedicated Web page set up by the economic operator placing the product on the market. Figure 3 shows how a multi-function data carrier works.

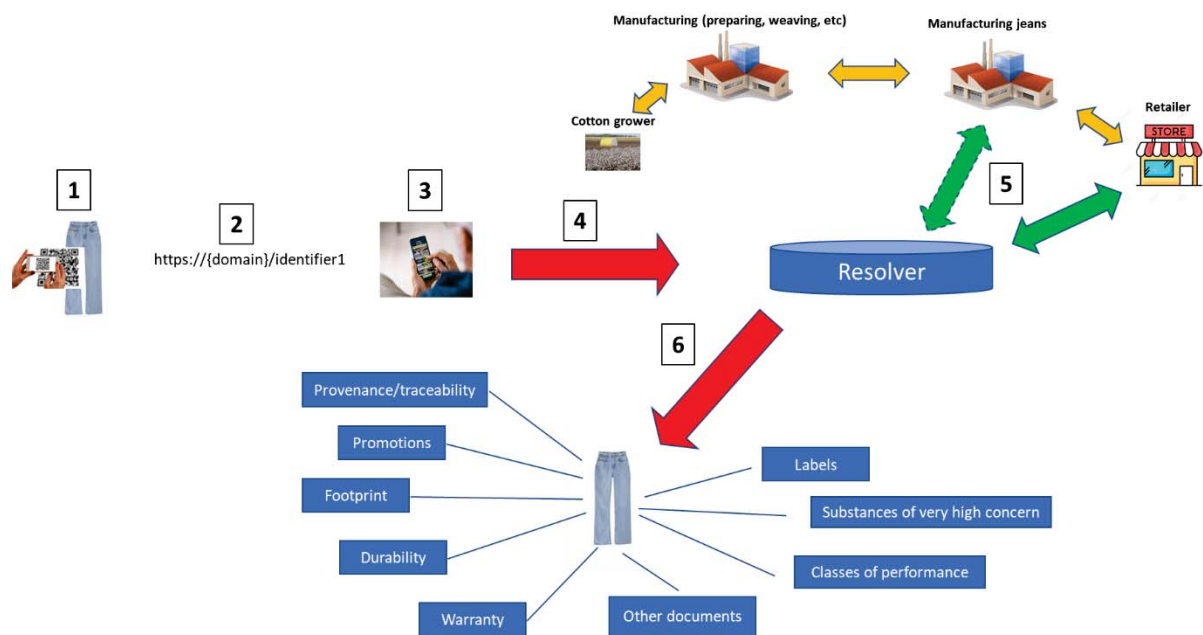


Figure 3 Multi-function data carriers in action: the example of a pair of jeans.

[1] A user scans an unique identifier through an app; [2] the app reads the digital link identifying the product scanned and [3] asks back to the user to select what information (s)he is interested in. Once the selection is done this information is passed to the resolver that identifies the corresponding “link types” and [5] connects to the web pages where the different information is stored. [6] Once the information is accessed to, the resolver sends back to the user, via the app, the information selected to which the user has access rights.

Much of the software required to accomplish this is freely accessible, particularly the software libraries that handle the scan and the libraries that converts element strings to the link. As a result, any app developer is likely to be able to construct an app, or even better, add new functionality to a current app, enabling the read of the European digital product passport.

Open source tools and developer’s documentation are freely available on the web⁶²².

Persistent uniform resource locators (URL)

The following description of an Uniform Resource Identifier (URI) can serve as an example for an option implemented with current technology. The final decision will be taken after a further analysis/study that will be done by the upcoming DEP project and other studies.

URI is a short, unique string of characters that uniquely identifies an abstract or physical resource. The increasing growth of open data and the goal to promote its interoperability have resulted in an increased dependence on URIs as identifiers for a broad range of concepts.

In order to enable long-term availability of the information connected to the EU DPP, it is important that the URL connected to the data carrier is persistent. Persistent URIs should not include file extensions or technologies. Many URI sets will be published and de-referenced programmatically and this will be done using a particular technology. 15 years ago it would

⁶²² For example at <https://github.com/gsl>

probably have been done using Perl, 10 year ago it would be done with PHP, today it might be with Python, Ruby, ASP.Net or any number of alternatives. Even something as seemingly stable as .html should be avoided. A document might be published today in HTML but in 20 years, maybe HTML8 will be so different that the file extension .html8 becomes common and some important documents might get updated accordingly. File extensions often reveal the technology used to create the resource and few things change as rapidly as technology. It follows that query strings should always be avoided too. So, something like <http://example.com/getId.aspx?id=7> is almost guaranteed to be ephemeral. Better to establish a URI such as <http://example.com/id/7> and let the server deconstruct it and return the relevant data through whatever technology is in use at the time, which can be updated as required with no change to the URI⁶²³.

An example of pattern for a URI designed for persistence is⁶²⁴:

<http://{domain}/{type}/{concept}/{reference}>

where,

{domain} is a combination of the host and the relevant sector. It is a matter of choice whether the sector is defined as a sub-domain of the host or as the first component of the path.

{type} should be one of a small number of possible values that declare the type of resource that is being identified. Typical examples include: 'id' or 'item' for real world objects; 'doc' for documents that describe those objects.

{concept} might be the type of real world object identified, the name of the concept scheme, etc.

{reference} is a specific item, term or concept

This comes originally from Designing URI Sets for the UK Public Sector⁶²⁵. The rules to be implemented to ensure permanence of the URL used in association with the data carriers shall be formalised in an open global standard. Other examples of persistent URIs are available in the Inspire Directive⁶²⁶ and in a guideline developed by the Flemish Administration⁶²⁷.

Granularity

The EU DPP should allow the different market actors to perform the following three tasks:

- Introduce relevant information in the system;
- Capture the information in a unique identifier;
- Allow access to information on a “need-to-know” basis.

The granularity of the system, meaning at which level the unique identifier is placed, should be appropriate for the product group and the typology of information that is most relevant to be made available. While more granularity improves accuracy, it also adds complexity (more

⁶²³ ISA, Interoperability Solutions for European Public Administrations – D7.1.3. “Study on persistent URIs, with identification of best practices and recommendations on the topic for the MSs and the EC”, 2012

⁶²⁴ idem

⁶²⁵ Available at <https://www.gov.uk/government/publications/designing-uri-sets-for-the-uk-public-sector>

⁶²⁶ <https://inspire.ec.europa.eu/implementation-identifiers-using-uris-inspire-%E2%80%93-frequently-asked-questions/59309>

⁶²⁷ https://joinup.ec.europa.eu/sites/default/files/document/2018-03/URI_Guidelines_Flanders_v0.9.pdf

unique identifiers to use and maintain) and costs, both internally and across the value chain (in transformation processes and shipments).

There are three main levels of identification for the information related to a product (granularity of the traceable asset):

- **Class-level**, for example used for tertiary packaging (e.g. boxes). All items of a particular category are identically labelled. It allows to distinguish one product from another but not of distinguishing two identical products of the same category. This is generally the least expensive method of marking since the marking may be included into bulk-printed package artwork. It gives the ability to see where different products are used along the supply chain and to collect statistics based on product counts. However, because all events related to a particular item are indistinguishable at this level, true tracing is not possible only based on unique identifiers at class-level. Class-level information is relevant for all features that are defined at the design phase and are identical for all items of the same model, such as energy and resource use, durability or maintainability.
- **Batch/lot-level**, used for products that show similar characteristics and that may not require serialisation. All products of a certain sort within a batch/lot are identically labelled. An information system is capable of distinguishing not just one product from another, but also two items of the same type from different lots/batches. However, it does not allow for the differentiation of two identical items within the same batch/lot. This is notably beneficial in business operations that deal with batch-by-batch quality concerns, such as a product recall due to a contaminated batch/lot, and to the computation of the environmental or social impact of a batch, which depends on the decisions taken in the production phase on the sourcing of the materials and parts of that batch. Traceability at the batch/lot level enables to determine the locations across the supply chain where a particular batch/lot has been transported, as well as the amount of goods present from that batch/lot.
- **Item-level**, used for products that have specific characteristics, changing from product to product, or that require serialisation. Each unique instance of a particular product is identified by a unique serial number, and therefore the combination of the class-level and serial numbers creates a globally unique identifier for a single product instance that is distinct from all other physical things in the universe. This enables the tracking or tracing of specific product instances, and hence the exact correlation of observations made at various points throughout the supply chain. This is advantageous for items with a lengthy product lifespan, as traceability requirements extend to business activities associated with the product's usage and maintenance. The benefit of instance-level identification is that the identifier reflects a single unique instance that may exist in just one location at a specific point in time. The other identification levels permit the existence of numerous instances or quantities (fixed or variable measure) bearing the same identifier at various places at a given moment in time, therefore limiting the quantity of knowledge about the instance(s).

While serialisation is not always necessary, it would enable the tracking of individual products as they move through the supply chain. Serialisation is the process of serialising

anything, whereas "unique identification" is the process of creating and applying codes or serial numbers that can be used to uniquely identify each particular instance of a given object.

The "serial number" (which may be numeric or alphanumeric in nature) is allocated to each instance of an entity for the duration of its existence; it may be created consecutively or randomly and may be expressed in human-readable (e.g. alphanumeric text) or machine-readable form.

While it is up to each economic operator to identify the most suitable level of granularity to be used for their own operations and products, the Commission could, when developing product-specific SPI measures, identify certain specific needs, for example related to the requirement (or not) to introduce a serial number to identify each single product item.

Data access models

There are several data access models based on different technical architecture concepts. Two of those are:

- Client – server, where the different participants in the system can either push the information (i.e. one-way transfer of data initiated by one economic operator) onto the repositories or the information is pulled from the economic operators.
- Distributed, loose architecture, with multiple layers based on Internet protocols. Such a system requires the establishment of well-defined entry points for economic operators. These could be automatic (e.g. through Application Programming Interfaces or APIs), manual or semi-automatic. Data availability (including the required data replication) as well as the integration technology could be left to each economic operator.

The advantages of the client/server model include, among others, tighter control of the system and the data, but its scalability is severely limited, the integration costs are usually higher and it is fairly obsolete, rendering such a system unfeasible.

The internet-based data access model is scalable, secure –if properly designed-, flexible, and cost-effective. Such a system requires setting up a data architecture, that would comprise management, governance and, if needed, migration of the data. It is suggested to use such a system that could be designed using the principles of the Open Group's TOGAF 9.2 standard⁶²⁸.

Specific care should be taken to ensure that any data entry into the system does comply with the interoperability constraints placed on the EU DPP data. This implies that the software enabling entry of EU DPP data into an IT system shall be controlled and approved to ensure this interoperability. Similarly, restrictions should be placed on the right for a company to change or erase data after certain deadlines are reached, such as the placement on the market of a given product class, or the end of production of a given batch or item.

⁶²⁸ The TOGAF® Standard, Version 9.2 (opengroup.org)

Management of access rights and identity

Two possible scenarios are foreseeable with reference to EU DPP access rights:

- a. Access on a “need-to-know” basis
- b. “Open access”

In both cases, when developing the product specific SPI measures, the Commission, in close coordination with relevant stakeholders and enforcement authorities, will identify for each attribute the corresponding access rights based on the role of the different actors along the supply chain (public, authorities, manufacturers and importers, recyclers/remanufacturers). Authorities would have access to the totality of the information included in the EU DPP (track & trace information + all attributes).

To clarify how access rights would be granted in practice, let’s suppose the European Commission is developing the EU DPP for a “desktop computer”.

1. Access on a “**need-to-know**” basis.

The EU DPP would contain information that is common to all products (e.g. name of the manufacturer), including the track and trace information pointing to sub-components of the product and the main events it has gone through. It will also contain information relevant only for “desktops”, like the operation manual, the availability of spare parts, how can the desktop be disassembled or even the bill of materials.

In the case of “need-to-know”, sensitive information will only be seen by public authorities and other companies in the value chain -like recyclers-, beyond the manufacturer. Other information will be generally available to the public, who can consult it, but can only be introduced and modified by the responsible manufacturer or importer.

The following table lists the common and specific parts that would comprise the EU DPP for desktops:

Table 101 Illustrative example of access role and rights for the EU DPP on a “need-to-know” basis.

| <i>Information</i> | <i>Typology of information</i> | <i>Roles</i> | <i>Access right⁶²⁹ & scope⁶³⁰</i> |
|---------------------------------|--------------------------------|---------------------------------|---|
| Name of the manufacturer | Common part/Key identifier | Public (P) | Read |
| | | Manufacturers & Importers (M&I) | Create/Change (limited to their company) |
| | | Authorities (A) | Create/Change (limited to the territorial scope of the authority) |
| GTIN (Global Trade Item Number) | Common part/Key identifier | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| TARIC | Common part/Key identifier | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |

⁶²⁹ “Read” Access means that the role (e.g. public, manufacturer, importer, public authority) can read the information concerned (e.g. TARIC, manuals) in the EU DPP but cannot create it or change it. “Create/Change” means that the role can read, create and change the information in the EU/DPP. “No access” means that the role has no access to the information (e.g. TARIC, manuals)

⁶³⁰ Scope indicates if there is a limitation to the access right (e.g. read/create/change). Potentially, a public authority could have access to all the information needed to exercise market surveillance for products in its own market.

| <i>Information</i> | <i>Typology of information</i> | <i>Roles</i> | <i>Access right⁶²⁹ & scope⁶³⁰</i> |
|---|--------------------------------|--------------|---|
| Documents supporting legal compliance | Common part/Key identifier | P | No access |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Track & trace | Common part | P | No access |
| | | M&I | Create/Change (company) |
| | | A | Read (territory of Public Authority) |
| Manuals | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Environmental footprint | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Spare parts availability | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Recycled content | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Bill of materials | Attribute | P | No access |
| | | M&I | Create/Change (company) Read (supply chain) |
| | | A | Read (territory of Public Authority) |
| Sleep mode power demand | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Substance of concern included in the plastic components | Attribute | P | No access |
| | | M&I | Create/Change (company) Recyclers / remanufacturers can access all |
| | | A | Read |
| Dismantability instructions | Attribute | P | No access |
| | | M&I | Create/Change (company) Recyclers / remanufacturers can access all |
| | | A | Read |

In case a consumer takes the desktop to a repairer, it could scan the data carrier attached to the desktop and –given the access rights the repairer has- download the necessary information to perform the repair. In this case public authorities and manufacturers, importers, recyclers, remanufacturers would have to be registered and use their credentials to access the system. Other stakeholders, like consumers or CSOs would not need any registration, but they will only have access to the public information. The registration process could be handled either by a separate system developed and operated by the European Commission, or could be left to the market once a set of technical specifications are established to allow for interoperability.

2. **“Open access”** basis. According to this scenario, most of the information would be available to every operator that scans the data carrier. A limited amount of data will remain only be accessible to the Commission and enforcement authorities.

In the case of the desktop repair described above, only manufacturers, importers and public authorities would have to be registered. All others (public, recyclers, and remanufacturers) would have open access to the system.

Applying this scenario to the same “desktop” may result in the following access rights:

Table 102 Illustrative example of access role and rights for the EU DPP on an “open access” basis.

| <i>Information</i> | <i>Typology of information</i> | <i>Roles</i> | <i>Access right & scope</i> |
|---|--------------------------------|---------------------------------|--|
| Name of the manufacturer | Common part/Key identifier | Public (P) | Read |
| | | Manufacturers & Importers (M&I) | Create/Change (limited to their company) |
| | | Authorities (A) | Create/Change |
| GTIN (Global Trade Item Number) | Common part/Key identifier | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| TARIC | Common part/Key identifier | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Documents supporting legal compliance | Common part/Key identifier | P | No access |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Track & trace | Common part | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Manuals | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Environmental footprint | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Spare parts availability | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Recycled content | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Bill of materials | Attribute | P | Read |
| | | M&I | Create/Change (company) Read |
| | | A | Read |
| Sleep mode power demand | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Substance of concern included in the plastic components | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |
| Dismantability instructions | Attribute | P | Read |
| | | M&I | Create/Change (company) |
| | | A | Read |

The EU DPP would also require an identity management system that a) is able to identify which users can have access to the system, and b) grants access rights to each user. If, in the example above, a user moves from company A to company B, the user should be able to edit information belonging to company B but not to company A.

The identity management system will use existing identity systems (e.g. eIDAS), thus reducing development costs.

Consumer Protection, Security, Privacy and Malicious content

The architecture of the European Digital Product Passport should be built in a way that commercial actors will not be able to interact with the consumer via spam, notifications, targeted advertising or any type of unwanted or personalised publicity. The EU DPP should not be a means to facilitate tracking, profiling or any other type of monitoring of consumers preferences or behaviour.

This would go against the core objectives of the EU DPP and, possibly, undermine the trust and the interests of consumers in using it.

Operation of the EU DPP will require standard security management practices, based on existing standards such as the family ISO 2700X. As a minimum, all sensitive information should be stored and sent encrypted. Given that this is a standard business practice it will not increase neither development nor operation costs.

Long term data availability

The economic operator responsible for placing the component/product on the market could identify a third-party independent service provider that acts as a back-up data repository for all the information (track & trace information and attributes) attached to the corresponding EU DPP. The details of the back-up data repository could be included as key information in the central registry managed by the European Commission.

The data supplied on the technical back-up infrastructure should be identical to those present on the Digital Product Passport. They should be updated at a frequency that ensures this identity of content to be maintained over time.

Operators of such backup services could be subject to requirements regarding:

- Their technical ability to ensure data security and integrity;
- Their financial independence and sustainability;
- Their capacity to ensure the compliance of the data entered in a mirror of the DPP with the technical requirements placed on that data (specifically: regarding interoperability);
- The provision to guarantee access to data, restricted to the Commission and to Market Surveillance and Customs Authorities.

This solution could ensure the **technical backup** and hence the safety of the data in case of bankruptcy or technical failure (including because of fire, flooding, earthquake) of the economic operator placing the product on the market and the data collected along the supply

chain. If one of such event happens, the Commission, a market surveillance authority or a customs authority should have direct access to the information stored in the back-up data repository.

An alternative option could be to have the data present only once in the system, with no replication made for data safety or security. This is obviously a cheaper option, but not in line with the general practice regarding high-reliability IT systems, nor with the level of data safety and security to be expected from the EU DPP infrastructure.

Data authentication, reliability and integrity

Whatever open standard is chosen, it shall also support the possibility of authentication and authorisation features to guarantee that only the economic operators who have introduced the data are also able to modify or delete them from the repository, with all the changes recorded in an audit trail.

The most relevant information could require an independent third-party to strengthen the reliability of the information provided. The details about the choice of the information requiring third-party verification and the verification modalities could be established when developing the product-group specific SPI measures.

The envisaged authentication and authorisation capabilities shall allow guaranteeing that competent authorities and the Commission have full access.

Any moving data through a network must use secure, authenticated, and industry-accepted encryption mechanisms and order security initiatives as such, data should be encrypted via application level, data traffic must be transmitted over Secure Sockets Layer (SSL), using only strong security protocols, such as Transport Layer Security (TLS), the connection between the database storage and application should also be encrypted end-to-end.

Track & trace information and attributes

The EU DPP includes two typology of information:

- a) **Track & trace** are a set of information related to the producer and events related to the track and tracing along the value chain;
- b) **Attributes** are information specific to the sustainability, circularity, compliance history and other technical characteristics of the component, or product.

The track & trace information belongs to five main categories:

1. **Who**, it identifies the entity that is engaged in the handling processing, possession, or ownership of items as they move through the supply chain. Where it is necessary to differentiate the entity and their involvement in the process, this should be included;
2. **What**, it may this information may relate to both individual goods and product shipments. Additionally, it may contain other physical or virtual things such as manufacturing processes, modes of transport, equipment (including returnable transportation goods), and documents.
3. **Where**, it specifies the location where these movements or events took place. Uniquely identified locations are critical to understanding the path an object takes across a supply chain.

4. **When**, the chronology of an object's journey through the supply chain is determined by the date, time, and time zone when a particular event happened.
5. **Why**, it gives the business context for the events that have taken place. A dispensing event may show that a specific medication was provided to a patient, while shipping and receiving events reflect changes in a chain of custody or ownership. Transformation events in manufacturing occur when one or more ingredients are permanently mixed to produce one or more new outputs or products.

Examples of track and trace information that could be included in the European digital product passport are:

- a. the manufacturer's name, registered trade name or intellectual property right (e.g., trade mark);
- b. the global trade item number or equivalent;
- c. TARIC Code;
- d. Global location number or equivalent;
- e. Documents/information supporting legal compliance
- f. Name, contact details and unique identifier of the authorised representative based in an EU Member State and/or person responsible for regulatory compliance;
- g. Name, contact details and other references of the service provider acting as technical back-up data repository, permanent URL of the technical backup.

The track & trace information could be the only one that is systematically sent to the central registry managed by the Commission.

The attributes are the “core business” of the EU DPP, as they include all the information related to sustainability, circularity and other technical characteristics of the component, or product.

Examples of attributes that could be included in the EU DPP are:

- a. Size, color,
- b. Net content and unit of measure;
- c. picture of the model based on standards
- d. Content of substances of concern;
- e. Recycled materials
- f. Information related to due diligence in supply chain
- g. Life cycle environmental footprint (including carbon footprint)
- h. Technical parameters
- i. Information on durability and reparability

The attributes could not be sent to the central registry. However, in order to carry out market surveillance, customs and other controls, in case of impossibility to have access to the attributes directly through the scanning of the data carrier, the enforcement authorities and the Commission should have access to the attributes through the technical back-up data storage facility of the economic operator that places the material, component, product on the market or puts it into service (the references of which is one of the track & trace information).

EU DPP central registry

The EU DPP central registry could be a thin centralised registry similar to the old “phone book”. It could include the “Track & trace” information component of the passport, like for example the name of the producer, the unique trade number, the TARIC code, the reference of where the back-up information is stored.

The central registry would not act as “entry point” for users looking for EU DPP information (that access may go directly through the decentralised access system). The registry would be used by the Commission, Member States, market surveillance and custom authorities for:

- Running statistical analyses for internal purposes;
- Have the references (digital link) to the location of the back-up storage, in case there are technical difficulties to access the manufacturer’s data or, for example, in case of bankruptcy.

The operational running of the central registry could be externalised to an external service provider in order to limit Commission involvement.

Operating Authority of the European digital product passport

The Operating Authority of the European digital product passport may be a public entity established at the scale of the European Union, in charge of:

- setting up and operating the “EU DPP central registry”,
- granting the access rights to different stakeholders,

The role of the operating authority could be played by the Commission, directly or identifying an independent service provider, or one of the European executive agencies.

Governance of the European digital product passport

The governance of the European digital product passport is the set of rules on “who decides on what and how”.

Roles in the system

The roles in the system could be the following:

1. Operating Authority of the European digital product passport;
2. Manufacturer or provider of product;
3. Importer and distributor;
4. Retailer, including second-hand seller;
5. Consumers, consumer associations and NGOs;
6. Maintainer or repairer of products;
7. Re-manufacturer of products;
8. Recycler;
9. Enforcement authority;

Nature of decisions susceptible to be taken

The decisions for which such rules are to be defined could relate to:

- a) The governance rules themselves and their evolution over time;
- b) The functional requirements placed on the EU DPP;
- c) The definition of roles in the system;
- d) The requirements placed on entities to be granted each role;
- e) The definition of the categories of information in the system;
- f) The nature of the information to be placed on the EU DPP, for each category;
- g) The format of the information to be placed on the DPP;
- h) The point in the course of their economic activity at which each role will gain access to the information to be placed on the DPP (e.g. for consumers, before or after purchase).
- i) The measures ensuring the comparability of the information present on the EU DPP (e.g. measurement methods);
- j) The measures ensuring the veracity upon writing of the information introduced on the EU DPP (e.g. third-party verification schemes);
- k) The measures ensuring the integrity of the information present on the EU DPP once written;
- l) The rights on information for each role and for each category of information: knowing the existence of the information, read, write, erase;
- m) The allocation of a role to a given entity and the withdrawal of that role;
- n) Evolutions of security features.

Bodies susceptible to take decisions

The bodies susceptible to take decisions could be:

- The EU legislator;
- The European Commission, under a delegated or implementing act;
- Member States;
- The Operating Authority of the European digital product passport;
- The European Standardisation Bodies CEN, CENELEC or ETSI;
- International ICT standardisation bodies, be they institutional (ISO, IEC) or based on private consortia.

Costs and Benefits assessment

The lack of a standardised way to communicate information entails costs for both producers and retailers. Producers/brand owners devote important resources (in the area of thousands of hours per year) to provide data to retailers in a wide range of formats. Retailers, for their part, spend significant time verifying data, collecting information from multiple sources to identify missing or inaccurate data and to synchronise formats and requirements across online and offline channels.

Industry challenges and concerns for **brand owners**



Industry challenges and concerns for **retailers**



Figure 4 Challenges and concerns for brand owners and retailers due to the lack of standardised information along supply chains (Source: McKinsey 2020).

SKU stands for stock keeping unit. It is a distinct type of item for sale. SKU can also refer to a unique identifier or code, sometimes represented via a barcode for scanning and tracking, that refers to the particular stock keeping unit.

The availability of a set of standards to communicate relevant information across the industry will have direct cost benefits especially in sectors for which the online shopping is becoming relevant. This so-called “omni-channel shopping experience” will be more seamless, and managing and exchanging product data will be faster, easier, and cheaper⁶³¹.

Based on forecast studies (McKinsey 2020), first movers are expected to see up to 5 to 10 percent improvement in online sales due to better data availability and product searchability in the near term. Moreover, the increase amount of information related to a product available for consumers before purchase, could lead to fewer product returns. This benefit will be especially important in categories such as apparel, where online sales and return rates can reach 25 percent. According to the same study, producers expect a standard data model exchange as the one enabled by the EU DPP, to reduce the efforts required in data preparation by 40 to 60 percent—saving some companies tens of thousands of work hours a year.

⁶³¹ McKinsey & C. “Want to improve consumer experience? Collaborate to build a product data standard”, April 2020.



Figure 5 Some of the expected benefits from EU DPP implementation for producers and retailers (McKinsey, 2020)

Even without standard data formats and systems, the benefits for companies of implementing tracking and tracing systems for their products is clear from their wide adoption. Apart from the obvious advantages in terms of stock control, logistics and marketing, Accenture⁶³² have identified further reasons that this is considered important. Their research showed that 63% of consumers refuse to buy products and services from companies they do not trust. 31% of CEOs mention supply chain complexity as a top-three business risk. They also found that maintaining consumer trust has a potential value in protecting sales from boycott of \$5bn per annum and a potential \$10bn in mitigating product recall costs. They calculated \$9bn of revenue potential across the overall consumer base in traceable products, and potential savings of \$26bn in operating costs through improved standards.

The deployment of the EU DPP entails some one-time investment from all companies who will need to adopt and implement the protocols and standards developed to make the EU DPP operational. The different actors along the value chains need to analyse gaps between the data models they use today and the EU DPP model. This analysis will help identify necessary changes in the systems they use to create and exchange product.

Cost estimation and cost allocation are critical elements in the adoption and implementation of the EU DPP. Effective and efficient public and private incentive structures, as well as accountability measures, also play a significant role.

The EU DPP, if designed in line with the indications provided in the sections above, reduce the need for significant investments in systems and technology for data input, product labelling, and different degrees of process, product, part, and component verification at all stages of the value chain. In reality, the investment's usefulness will be determined by how much each company has already implemented some (or all) of the required components.

Many players seeking traceability are concerned about these expenses, particularly non-vertically integrated businesses, brands, and SMEs.

Costs associated with the European digital product passport deployment can be classified into two categories:

⁶³² Accenture Strategy – “Trust, Transparency and Traceability: Creating business value through enhanced trust and reduced risk across the value chain” (2016) https://www.accenture.com/t20160729t074954_w_w_/cr-en/acnmedia/pdf-27/accenture-trust-transparency-infographic.pdf

- (1) CAPEX costs, associated with the cost of system's equipment, installation, installation support and implementation.
- (2) OPEX costs include operation of the system, data collecting, enabling data interchange across systems, inventory management, and labelling.

Additionally, expenses associated with fulfilling sustainability verification requirements like certification or auditing may exist, but are not necessarily related to the EU DPP per se, as these verification requirements could be enacted even in the absence of the EU DPP.

The costs related to the acquisition/calculation of the attributes to be added to the European digital product passport (e.g. amount of recycled content, environmental footprint, testing certificates, etc.) are not included in the assessment costs, as such information would be identified as a requirement in the SPI measures, and would be incurred by companies also if the European digital product passport is not implemented.

There are very few examples of European digital product passports already deployed by public authorities to look at in order to extrapolate cost-related information. Most of them are in Europe: the traceability system for tobacco products, the identification system for medical devices, and more recently and still under development, the European digital product passport for industrial and electric vehicle batteries.

However, a direct correlation between the costs estimated for these three legislations and the SPI EU DPP is not possible, not only because they have different objectives (especially true for tobacco and medical device systems) but mostly because the design of the systems, and therefore the specific requirements and needs, are very different. All of the above-mentioned trace and tracking systems are largely based on centralised systems (a semi-centralised one for batteries), whilst the European digital product passport for SPI has been conceived as a decentralised system. This choice leads to major cost reductions for the Commission compared to a centralised system, but the lack of equivalent data does not allow a full quantification of those savings.

Moreover, as already mentioned, a large number of companies already use track and tracing systems, meaning that the costs related to the IT infrastructure and, partly, to data collection is expected to be much lower compared to a company that is starting from scratch.

Therefore, the figures provided in Annex 10 should only be considered as a reference, as the real costs will change depending, among other things, on the product group, the availability of standards and data, the need to include dynamic information, the number of components, the IT readiness of the different economic operators.

Marking products with a unique identifier

The marking of a product with a unique identifier involves the following tasks:

- Generation of the unique identifier(s) at the required level of granularity (single item, batch, class level);
- Application of the unique identifier;
- Optical verification if the unique identifier(s) have been correctly applied (e.g. random test to check conformity with ISO/IEC 15416:2016 on unique identifiers' readability).

All three tasks outlined above are the responsibility of product manufacturer and importers. Where following supply chain operators, such as distributors, aggregate (or re-aggregate) the

products, the operators in question is permitted to create unique identifiers themselves or request them from the manufacturer. These operators are subsequently be tasked with the responsibility of applying and validating them to aggregated packaging.

The cost of creating the unique identifier is very low and proportional to the number of codes requested⁶³³. The UI issuing cost could become higher in case of serialisation, as it happened for the tobacco products. In that case, the cost is at minimum of 0.39 € for 10.000⁶³⁴.

Numerous experts consulted emphasize the critical nature of using open and worldwide standards in order to maximize the global efficacy of a tracking and tracing system. According to experts, the deployment of proprietary solutions by certain businesses or sectors would jeopardize the European digital product passport's overall compatibility. Thus, the possibility of delegating responsibility for the creation and use of unique identifiers to industry is coupled with a clear constraint on the standards to be utilised.

Along with standardisation information and since the European digital product passport is based on open standards, these data exchange standards must include authentication and authorisation capabilities that ensure economic operators cannot alter or remove data from the repository.

The economic impact of permitted data carriers on manufacturers and importers is determined by the cost of adapting their manufacturing processes to include printing and affixing operations. It is anticipated that each manufacturing line would print just one data carrier, and that some economic operators will have to modify their lines.

As previously mentioned, the manufacturer's cost related to marking a product with a unique identifier is dependent on which of the three possible situations is considered:

- Economic operators already own the required equipment and may easily print or attach the data carrier.
- Economic operators own comparable equipment and may configure it for printing or affixing the permitted data carriers.
- Economic operators lack the required equipment, which they must include and integrate into their manufacturing processes.

In Table 103 are reported the costs used for the tobacco tracing impact assessment⁶³⁵. These costs are expected to vary depending on the sectors, the size of the companies, the kind of data carrier, and the level of current implementation of track and trace systems, and therefore serve only as an illustration.

⁶³³ GS1, personal communication.

⁶³⁴ The cost vary from Member State to Member State, depending on overheads.

⁶³⁵ Commission staff working document (2017) 455 final

Table 103 CAPEX unitary costs for the printing and checks of the unique identifier.

| <i>Task</i> | <i>Type</i> | <i>Minimum</i> | <i>Maximum</i> |
|---|------------------------------|----------------|----------------|
| Primary product printer and verification equipment (including installation) | High speed production line | 290,000 € | 355,000 € |
| Primary product printer and verification equipment (including installation) | Low speed production line | 30,000 € | 57,000 € |
| Aggregated packaging (e.g. carton) printer and verification equipment (including installation) | High speed production line | 112,166 € | 112,166 € |
| Aggregated packaging (e.g. carton) printer and verification equipment (including installation) | Low speed production line | 6,000 € | 9,000 € |
| Tertiary packaging (e.g. pallet) printer and verification equipment (including installation) | All manufacturing facilities | 3,000 € | 3,000 € |
| Equipment for reading the data carriers – 1 computer + 2 optical readers (check and control system) | All manufacturing facilities | 10,000 € | 10,000 € |
| Company server and software | All warehousing facilities | 6,000 € | 6,000 € |
| Serial number generation (when serialisation is required) – cost per item | | 0,000229 € | 0,000628 € |

Table 104 OPEX unitary costs for the printing and verification of the unique identifier.

| <i>Task</i> | <i>Minimum</i> | <i>Maximum</i> |
|--|----------------|----------------|
| Operational cost per item printed | 0,00015 € | 0,0006 € |
| Operational cost per carton/pallet printed | 0,0021 € | 0,0021 € |

Processing, storing and sharing data

To enable efficient monitoring and enforcement operations, the Commission, national competent authorities, and any designated external auditor must have full access to the data (and any underlying calculation/information) contained in the European digital product passport.

The economic operator responsible for placing the component/product on the EU market shall store the information included in the European digital product passport as part of their own data storage facility and appoint an independent party to act as technical back-up data storage provider.

In terms of sharing data along the supply chain, there are relevant standards (e.g. ISO 19987:2015 EPC Information services) that defines how to exchange information on the different supply chain events that may occur (e.g., dispatch, receipt, goods movement, trade, and (dis-)aggregate). This standard covers both the data model and the technical communication methods used to transmit this data safely. ISO/IEC 19987:2015 EPC Information services is considered the best reference standard based on its completeness, flexibility and proved functioning in international supply chain production systems.

The cost of data storage is mostly determined by the sizing estimation, which is based on a standard data model that contains information about the average size of various messages. As a result, the charges are independent of the actual goods reported, as they just indicate alternative identities.

The estimates below are based on the average size of each message type and conform to the ISO/IEC 19987:2015 EPC Information services standard.

Table 105 Assumptions regarding the estimation of the data storage sizing⁶³⁶

| Assumption | Value (in bytes) |
|--|-------------------------|
| Average message size when reporting a traceability event at unit level. | 1,024 |
| Average message size when reporting an event with aggregation information. | 3,072 |
| Average message size when reporting an event about reverse logistics or repackaging. | 3,584 |
| Average message size, in bytes, for exchanging trade information. | 10,240 |

The data storage sizing requirements change depending on the product groups and the number of events to be recorded by each economic operator. As a matter of example, for the tobacco products the number of unique identifiers released each year is around 29 billion. This is equivalent to an expected yearly storage capacity between 32 and 100 TB.

For the tobacco products this led to an estimation of costs of around 161.5 million Euro (CAPEX) and 5 million Euro (OPEX). This is equivalent to an annualised cost of about 8 million Euro, i.e. 0,00026 € per item marked.

Administrative costs for the Commission and national authorities

One component of the economic burden on public authorities is determined by the cost of the equipment required to conduct inspection and control operations properly (scanners and verification equipment). According to the previously done impact assessment (e.g. for the tobacco products track and tracing system), there are many kinds of scanners that allow the reading of a range of various forms of data carriers depending on their nature. As a result, the effect is proportional to the quantity and kind of data carriers to be used for the European digital product passport.

As far as the cost of running a central registry, it is only possible to indirectly assess this cost through extrapolation of the costs incurred to implement the central registry for the tobacco products track and tracing system. However, a decision, if such a central registry is adequate and of added value, will be decided upon at a later stage.

According to Regulation 2018/574⁶³⁷, the tobacco products central registry (called secondary repository) has the following tasks:

⁶³⁶ This information is extracted from the Commission SWD (2017) 455 final

⁶³⁷ COMMISSION IMPLEMENTING REGULATION (EU) 2018/574 of 15 December 2017 on technical standards for the establishment and operation of a traceability system for tobacco products, OJEU L 96/7 16.04.2018

- a) it contains a copy of all data stored in primary repositories;
- b) it provides for graphical and non-graphical user interfaces that enable Member States and the Commission to access and query the data stored in the repositories system. In particular, it allows:
 - a. retrieval of any information concerning one or multiple unique identifier(s), including the comparison and cross-checking of multiple unique identifiers and the related information, in particular their location in the supply chain;
 - b. creation of lists and statistics, such as product stocks and inflow/outflow numbers;
 - c. identification of all tobacco products that have been reported by an economic operator to the system, including the products reported as recalled, withdrawn, stolen, missing or intended for destruction.
- c) it shall allow for the receipt, storing and making available of offline flat-files for the purpose of updating verification devices used by Member States for offline decoding of unique identifiers;
- d) The provider of the secondary repository shall set up and manage a router.

For the tobacco registry the cost⁶³⁸ is estimated in the order of **1.4 € per ten thousand unique identifiers**.

However, due to the specificities of the products in scope and the objective of Regulation 2018/574 (combating illicit trade in tobacco products), the centralised nature of the system (and the related need to host a duplication of all data), and the additional features requested, the costs of the tobacco products central registry are expected to be higher than the costs to run the EU DPP central registry.

The exact costs will depend, among other things, by the number of identifiers processed on a yearly basis, the amount of data to be included in the track & tracing system, the availability of statistical analysis tools.

Incentives

Financial incentives include both positive and negative economic and fiscal incentives that governments may use to promote value chain traceability and transparency.

Several of these potential incentives include the following:

- Financial assistance for technical innovation in the digital domain
- Infrastructure investments, both physical and digital
- Direct financial incentives for developing interoperable systems and digitalization
- Financing loans and grants with preferential terms based on traceability and transparency requirements

⁶³⁸ DG SANTE, confidential information

- Financial support for feasibility studies and pilot initiatives, with a special emphasis on value chains with a high proportion of SMEs.

The Commission and Member States should provide financial and fiscal incentives (both positive and negative) to encourage the establishment and implementation of value chain traceability and transparency systems, particularly for micro and small businesses, producers, and other vulnerable groups such as women, young workers, home-based workers, and migrant workers.

In particular, SMEs integration can be facilitated through a combination of financial and non-financial incentives, including increased market access, facilitated payments, specialized managerial and workforce training, infrastructure investment, expedited processes, and public visibility. Additionally, technical and organizational assistance should be provided.

Moreover, non-financial incentives should be provided, such as steps to ease market access, fast-track procedures, environmentally and socially responsible public procurement criteria, specialized management and worker training, public exposure, peer-learning, and non-financial reporting requirements.

Annex 19: SME Test

| | |
|--|---|
| (1) Preliminary assessment of businesses likely to be affected | |
| <ul style="list-style-type: none"> • SMEs are among businesses likely to be affected by SPI. If the Ecodesign legislation is extended to several priority groups (part of CEAP), SMEs will be affected to the extent that they are part of the value chain of these product groups: <ul style="list-style-type: none"> ○ Textiles, wearing apparel and leather and related products (35% SMEs by turnover, 23% by employment⁶³⁹) ○ Chemicals (29/39%) ○ High impact intermediary products, such as steel (basic metals: 24/29%) ○ Motor vehicles and other transport equipment (6/14%) ○ Furniture (64/71%) • A shift of activity from the processing of primary towards secondary raw materials and from production of products to maintenance, reuse, refurbishment and repair is expected to benefit SMEs significantly because they are more active in these sectors. | (See Annex 10, analysis of PO2 and PO3) |
| (2) Consultation with SMEs representatives | |
| <ul style="list-style-type: none"> - A first dedicated SME consultation from April to June 2021 received 332 responses, with 90% of the respondents being Enterprise Europe Network (EEN) members. Over 50% of the businesses are located in four EU Member States: In total, 17 countries are represented. 56% of the companies are active in industry, followed by services (21%), wholesale and retail (11%) and construction (3%). - SMEs also had the chance to express their views in 7 workshops organised by the Commission as well as through the open public consultation (OPC). In the OPC, 64 SMEs (representing company/business organisation with less than 250 employees) participated. The majority of these SMEs (65%) produce intermediate and/or final products, with the remaining involved in other business, such as services. 81% of the SMEs responding to the OPC are located within the EU and 21 countries are represented. - A second targeted SME survey was launched in October 2021 and lasted 2 weeks. It built on the first SME survey described above and drew on the expertise of organisations representing SMEs (<u>Enterprise Europe Network</u> (EEN) contact points and other SME representative bodies) to | (See in particular summary of SME survey within Annex 2 Stakeholder consultation) |

⁶³⁹ Eurostat (2021). Structural Business Statistics. Annual enterprise statistics by size class for special aggregates of activities (NACE Rev. 2). SBS_SC_SCA_R2.

gain a better understanding of the potential impacts on SMEs of some of the main options. The targeted survey received 35 replies. Responding organisation indicated they were located in the following EU Member States: Belgium, Denmark, Germany, Spain, Italy, Poland and Portugal.

Main conclusions of the OPC and first SME consultation:

Company environmental/social impact and engagement in sustainable products

- SMEs are engaged in the sustainable product transition and are to some extent aware of their impact. Most SMEs can estimate their environmental and social impacts at least to some extent, with 53% fully or to a large extent.
- Almost half of the SMEs are currently introducing more sustainable products to the European market frequently (24%) or almost always (21%).
- In terms of innovation activities, SMEs are more frequently engaged in sustainable product innovation compared to regular product renovation. SMEs are less frequently engaged in innovation concerning circularity, and to a lesser extent with innovation concerning social aspects and design aspects.

Internal market fragmentation

- 66% of SMEs (OPC, n=59) strongly agree or agree that products sold in the EU are not sustainable because there is no harmonised set of requirements to foster sustainable design of products;

Extending sustainability requirements for products

- More than half of SMEs participating in the OPC (56%, n=59) are in favour of setting binding rules at product group level to oblige producers to improve product durability, reusability, upgradability and reparability, in order to foster sustainability of products in the EU.
- 55% of SMEs in the OPC (n=57) are in favour of banning substance(s), such as those that inhibit product recyclability.

Circular business models

- SMEs are most familiar with green supply chain management, shorter supply chains and product-service systems where buyers do not necessarily buy a product but rather services associated to the product.
- SMEs are least familiar with sustainable design models and social models (giving model, social mission model, etc.). Of the established circular business models, SMEs are most familiar with recycling/ upcycling, reuse network, industrial symbiosis and customer advice on repairs.
- SMEs find that regulations and incentives both incentivise innovation in sustainable products (70% agree or strongly agree) as well as enable circular business models (69% agree or strongly agree). Sufficient access to financing also is a key enabler of circular business models according to

SMEs (66% agree or strongly agree)

- According to SMEs participating in the OPC, the most effective circular business models are collaborative and sharing economy, reverse logistics and product-service systems.
- SMEs participating in the OPC consider the lack of a clear regulatory framework to support circular business models (65% score at least 4 out of 5, n=54) and lack of consumer awareness of and responsiveness to circular business models (62%, n=55) to be major barriers to a successful deployment of these types of business models
- During the second workshop on policy support for circular business models, stakeholders agreed that business support and network opportunities for SMEs and start-ups needs to be emphasised, particularly at regional level.

Economic and reputational incentives for product sustainability

- According to SMEs, the economic incentives with the greatest benefit are direct subsidies and other financial incentives (tax exceptions/VAT reductions) linked to products that meet certain sustainability criteria. This is followed by conditions attached to EU financing instruments and State aid; circular innovation vouchers; eco-vouchers; product standards, etc.
- Sustainability labelling based on environmental, social and circularity impact as a reputation incentive are expected to have high benefits.
- SME support facilities for development of circular business models patterns and Green Deals that combine support for the removal of regulatory barriers and R&D funding are also considered to benefit, but to a lesser extent.
- SMEs responding to the OPC find the following incentives effective in the following order: modulation of fees on the sustainability of products under Extended Producer Responsibility schemes, improving access to finance for production and consumption of more sustainable products, better use of standardisation to promote sustainability, increase transparency on the performance of products, develop and implement mandatory Green Public Procurement criteria and targets, recognise voluntary commitments by producers to increase sustainability of products and better use and promotion of voluntary sustainability labels (e.g. EU Ecolabel).

Digital Product Passport

- The main environmental impacts expected from SMEs from the Digital Product Passport (DPP) are increasing the amount of products with low climate impact and lowering pollution levels, followed by gradually phasing out the use of environmentally harmful materials in product on the EU market and mitigating biodiversity loss.
- The main social impact expected is increasing consumer empowerment due to greater availability of product information, followed by improving working conditions and reducing environmental crime at a global level.
- In the first SME survey, approximately three times more SMEs agreed or strongly agreed that introduction of a DPP 'could contribute to higher economic returns for EU companies' than those that disagreed or strongly

disagreed with this statement.

- In response to the OPC, SMEs consider that the following information should be collected in a DPP ($\geq 50\%$ agree or strongly agree, in order of agreement): how product should be recycled/handled at end of life; instructions and safe use; product environmental and/or carbon footprint; presence of hazardous chemicals; relevant information for testing, disassembly, maintenance, repair or reassembly; economic actors at the origin of information; list of present materials/substances in product; expected lifespan of product; list of legislation and standards complied to by product; any possession of sustainability labels; recycled content of each material present in product; quantities of materials and substances present in product; information on origin of product components, results of compliance tests against legislation/standard/technical specifications, information on material sources, information relevant to re-manufacture and spare parts and social conditions along the value chain.
- During the third workshop, focusing on Digital Product Passports, stakeholders brought up the concern that there should be a distinction between SMEs and large companies, since SMEs may lack the capacity to comply with the requirements of DPP.

Unsold consumer products

- SMEs are most likely to handle unsold consumer products by systematically discounting the price until they are sold to a customer or recovering materials from unsold products (or sending them to professional recovery/recycling services). Approximately 16% agreed or strongly agreed that such products would be sent to be incinerated or landfilled, while approximately half disagreed or strongly disagreed that this would take place.
- SMEs participating in the OPC are supportive of fostering reconditioning and remanufacturing schemes (69%) as well as boosting more sustainable business models (59%) as additional measures to decrease the amount of unsold goods in the EU (n=51).
- According to SMEs in the OPC, products that pose a health or safety risk should be excluded from a ban of the destruction of consumer products.

Market Surveillance

- SMEs participating in the OPC are particularly in favour of accompanying measures from the Commission to MSs, such as guidance support, carry out market surveillance and enforcement of product compliance. Setting verification targets for products that are most likely to be non-compliant as well as creating a central reporting point/website to enable feedback from consumers are both considered important by SMEs as well.

Costs vs. benefits

- 56% of respondents to the SME survey anticipate a high to very high increase in administrative burden compared to the baseline scenario. However, this must be put in perspective with the overwhelming support, across all stakeholders (including SMEs) for a digital product passport.

As indicated in indirect cost, 42% of SME respondents expect higher economic return for EU businesses. Results of the consultations show that expected environmental benefits are worth the cost of the measure.

- The SME survey results indicate however that a majority of SMEs would be unaffected (29%), not concerned (19%) or negatively affected (4%) by a requirement for public authorities to purchase a minimum proportion of sustainable products in the total public procurement.
- 70% of the respondents agree or strongly agree that regulations and incentives incentivise innovation in sustainable products.

Main conclusions of second targeted SME consultation (please see full details in Annex 2):

Product Sustainability requirements

- Indication that **product sustainability requirements (such as relating to reparability, durability and reusability)** may give rise to some negative impacts for SMEs (such as medium to high administrative or compliance costs) but bring added value over time
- Indication that **minimum recycled content requirements** are likely to cause some negative impacts for SMEs (such as medium to high administrative or compliance costs) but bring added value over time

Information requirements for products

- Mixed views on likely impact on SMEs of **requirements to provide information on the ecological profile of products**: strong indication that though these may cause some negative impacts (such as medium to high administrative or compliance costs) they may bring added value over time; risk nevertheless signalled by some of potential for high negative impact
- Mixed views on impact of requiring SMEs to provide information on social conditions of production
- Indication that the administrative and compliance costs associated with the above-mentioned information requirements would be medium to high for SMEs

Incentives

- Indication that mandatory Green Public Procurement criteria may bring positive benefits for SMEs
- Indication that linking incentives to classes of product performance may bring positive benefits for SMEs
- Mixed to poor indication that modulation of EPR fees according to classes of performance would be of benefit for SMEs

Destruction of unsold consumer products

- Suggestion that an EU-wide ban on destruction of unsold consumer products may have a positive overall impact on some SME business models, while others may remain largely unaffected by such a ban. Risk nevertheless signalled that some SMEs may experience negative effects due to the need to find alternative options for these goods.

(3) Measurement of the impact on SMEs

Annex 10 elaborated on the impacts of different options on economic operators. No specific measurements of the impact on SMEs could be performed but, whenever possible, it has been pointed out what the impact of Policy Options on SMEs is.

- An increase in compliance costs for SMEs in sectors covered by the Ecodesign Directive is expected;
- A cost increase is expected with regards to adapting aspects of the operation such as raw material requirements, product design, post first use and end of life;
- Additional costs are expected with regards to testing equipment/paid studies on environmental performance as well as complying with targeted due diligence requirement where applicable;
- Businesses (including SMEs) will benefit from higher prices and higher margins for better, more sustainable products;
- Improvement of the level playing field between companies in Europe
- For recyclers (among which the share of SMEs is big): growth in the market of recycled materials and of their quality is expected;
- Growth in the sector of repair services, refurbishment, remanufacturing and sale of second-hand products and thus jobs in these sectors, in particular social and social economy organisations and SMEs;
- For some sectors (for example electrical and electronic products), there is an opportunity for European companies to develop and capture the repair and refurbished market where significant growth has been seen recently;
- A positive impact on innovation among SMEs is expected similarly to the impacts that have been observed within the Ecodesign Directive for businesses as a whole. These are proportionate to the level of ambition of the legislation;
- Competitive advantage globally for EU companies (a big share of SMEs) providing sustainable products / services and focused on sustainability will be observed;
- New business opportunities for SMEs in terms of products or services provided;
- Decreasing activity (or adaptation) for companies producing single-use, low-cost products, possibly new partnerships;
- Decreasing activity for mining and quarrying sector which will impact SMEs in the sector as a supplier;
- SMEs, like other businesses, will have to face the cost of new information collection and reporting and these will weigh more heavily on SMEs as fixed costs are spread over lower sales. For example, in the textile industry, collection of information on durability and reliability has been estimated by an industry association at about €10,000 to €20,000 per company to set-up the collection process, especially in the absence of standards for estimating durability. These costs will be relatively heavier for SMEs;

(Insights on impacts are in Annex 10)

Analysis of PO2

Analysis of PO2

Analysis of PO3

Analysis of PO4

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| <ul style="list-style-type: none"> • Differentiated taxation, GPP and eco-vouchers are all instruments that contribute to an increase of demand for sustainable products and services, which impacts positively the turnover of companies (including SMEs) providing them (associated with reputational gain)⁶⁴⁰; • While option 5a could result in cost increases for companies to invest in sustainable production, it also provides opportunities for companies that are currently designing sustainable products. That can be especially profitable for SMEs that provide innovative solutions⁶⁴¹. Compared to large companies, SMEs are usually less innovative, even though some are highly innovative with a potential to reach higher productivity levels⁶⁴². These very innovative SMEs could benefit from a willingness from private and public consumers to buy ‘greener’ products or from the implementation of incentives shedding the light on more sustainable products. On the other hand, there are less likely to benefit from economies of scales; • According to an EU-level study, servitisation brings a 1-10% increase in annual turnover to servitised SMEs in Europe⁶⁴³. Manufacturing SMEs report an increase of revenues as a result of introducing services, as well as the generation of new clients⁶⁴⁴. Although still in its early stages, the market for circular reverse logistics is expected to generate a strong economic impact with the surge of online sales, where 30% of products bought online are returned; • SMEs could specifically benefit from a streamlined Ecodesign process since it will be less burdensome to participate in, or follow the process. However, expanded provisions related to third party conformity assessment will affect them economically more than they will affect larger businesses. <p>Overall, the proposed policy interventions do not represent a disproportionate burden to SMEs compared to bigger enterprises.</p> | <p>Analysis of PO5</p> <p>Analysis of PO6</p> <p>Analysis of PO7</p> |
| <p>4) Assess alternative options and mitigating measures</p> | |
| <p>The following measures could be considered to specifically mitigate the impacts on SMEs.</p> | <p>Annex 10, analysis of PO3</p> |

⁶⁴⁰ DG ENV 2020, Report on 2018-2019 stakeholder consultations regarding the potential future use of the Product and Organisation Environmental Footprint methods

⁶⁴¹ Irish Department of the Environment, Climate and Communications 2021, Green Tenders - an Action Plan on Green Public Procurement

⁶⁴² OECD 2018, Promoting innovation in established SMEs

⁶⁴³ Ibid

⁶⁴⁴ European Commission. Study on the potential of servitisation and other forms of product-service provision for EU SMEs (2018)

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| <ul style="list-style-type: none"> • Assistance with environmental and carbon footprint calculation/life cycle assessment methods, including PEF (such as the availability of simplified calculation tools, access to low-cost expertise Life Cycle Assessments, access to software and databases enabling the performance of Life Cycle Assessments, and support through existing funding and financing tools). <i>To note:</i> The Commission is considering possible measures to facilitate the preparation of PEF studies by SMEs, including free IT calculation tools to reduce the costs for carbon footprint calculation. • The implementation calendar of sustainability requirements for each product group could be arranged so as to match that of introduction of the next generation of products, so that these requirements do not generate the need to design a supplementary generation (<i>this measure could also benefit non-SMEs too</i>). • Dedicated SME provisions: where justified, based on detailed impact assessments prior to adoption of SPI measures, certain exemptions or more lenient provisions for SMEs (e.g. longer transitional periods or exhaustion of stock provisions). • Simplified SME procedures: e.g. for reporting. • Targeted guidance and support: guidelines, training, user manuals, fostering of exchange of best practice will be foreseen by the Commission. Measures under sub-option 6a will contribute, as will Commission networks like the Circular Economy Stakeholder Platform. | <p>Analysis of PO4</p> <p>Analysis of PO4</p> |
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