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Regulations (EU) No 1059/2010, 1060/2010, 1061/2010, 1062/2010,
626/2011, 392/2012, 874/2012, 665/2013, 811/2013 and 812/2013 with
regard to labelling of energy-related products on the Internet

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IMPACT ASSESSMENT

Accompanying the document

Commission Delegated Regulation

amending Commission Delegated Regulations (EU) No 1059/2010, 1060/2010, 1061/2010, 1062/2010, 626/2011, 392/2012, 874/2012, 665/2013, 811/2013 and 812/2013 with regard to labelling of energy-related products on the Internet

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This report commits only the Commission's services involved in its preparation and does not prejudge the final form of any decision to be taken by the Commission.

1. INTRODUCTION

EU Directive 2010/30/EU on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products (the "Energy Labelling Directive" or "the Directive") requires for specific energy-related products the development of delegated acts that require mandatory display of an energy label at the point of sale. The main element of this label is a green-yellow-red coloured A-G class scale (possibly supplemented with A+, A++ and A+++ class) indicating the energy efficiency of the product.

The Directive was revised in 2010 to update 1992 Energy Labelling Directive. That Directive was estimated to have contributed to annual energy savings in the order of 3 Mtoe corresponding to emission reductions of some 14 Mt of Co2 annually over the period 1996-2004. It also helped manufacturers to position their products on the market and get some payback on their investments for introducing better and more innovative appliances. The Energy Labelling Directive was and is therefore considered as a win-win instrument for consumers, industry and the environment.¹ The revision provided the possibility to supplement the labelling scale with A+, A++ and A+++ classes. It also provided the possibility do display the energy label on the internet, rather than only indicating the energy class of the product concerned.

In distance selling, such as by mail order, by catalogue, through the internet or through telemarketing, the potential end-user cannot be expected to see the product displayed, and thus neither the energy label. Therefore, the delegated acts are required by Article 7 of the Directive to contain provisions ensuring that, in the case of distance selling, end-users are provided with the label or with the information specified on the label before buying the product. The delegated acts adopted until now only required that the information that is on the label is shown in a specific order, but – unlike the displaying of the energy label in shops – there is currently no requirement in those delegated acts to provide the label itself or for the information to be provided according to a specific visual format. For example, for the energy efficiency, currently only the class is indicated without colouring or showing of the other potential classes. For the product fiche which contains further technical product information that the Directive also requires to be available to consumers in shops, the situation for distance selling is that this information is usually not made available.

As mentioned above, the 2010 revision of the Energy Labelling Directive provided possibility do display the energy label on the internet. The Consumer 2020 study² suggested that for internet selling providing the label and the fiche in the same way as in shops may be beneficial to consumers and to the environmental goals of the policy, The "Bringing online into line" study³ quantifies these effects. It further suggested that due to technological

¹ SEC(2008) 2862

² See section 2.2

³ See section 2.2

progress this is now possible. This report assesses whether it is necessary to change the way the content of the energy label and product fiche is communicated in the case of internet selling and if so through which measure this would be best achieved. The report address only on-line selling, i.e. it does not address other forms of distance selling (mail-order, catalogue or distance selling via television)

1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Organisation and timing

The inter-service Impact Assessment Steering Committee⁴ met on 29 November 2012 to discuss the impact assessment. The present impact assessment takes into account the recommendations formulated by the Impact Assessment Board on 1 February 2013 by inter alia: providing more detail on how this work followed from the revision of the Energy Labelling Directive in 2010 and what technical and stakeholder processes were followed; providing more detail on why certain technical and type of action options are discarded; and providing a clearer presentation of the impacts of the options.

1.2. Consultation and expertise

In the consultation that was done for the revision of the Energy Labelling Directive stakeholders agreed on the proposal to "Reinforce provision of labels on internet sales". This is referred to in the 2008 impact assessment supporting the proposal for that revision.⁵ This led to the provisions on distance selling, including internet selling, being changed to allow delegated acts also to indicate the way the label and the fiche should be displayed in distance selling rather than only information related to it. After the adoption of the revised Directive in 2010, the work to prepare for this was started through a technical advisory group, consisting of representatives of Borderlinx, IMRworld, Zen Digital, ATG, Microsoft, Pixmania and Kelkoo. The technical advisory group discussed technical options for the on-line display of the energy label of which the main outcome is provided in Annex V.

The Consultation Forum established under Directive 2009/125/EC ("Ecodesign Directive") which has a balanced composition⁶ and includes all stakeholders that are normally consulted on draft delegated acts under the Energy Labelling Directive was consulted on 18 April and 10 July 2012. In the meeting of 18 April the Commission services presented the results of the work of the technical advisory group and discussed legal and technical options for the display of the energy label online. The Consultation Forum took, in general, a positive view and supported the Commission in finding a technologically neutral, low to no cost solution that could be implemented as part of normal business cycles. In the meeting of 10 July the Commission services presented a working document containing a detailed proposal and suggested modalities for moving forward. The minutes of the meetings of 18 April and 10

⁴ Chaired by DG Energy in cooperation with DG Connect. Other Commission Directorates General who were part of this group included Secretariat-General, DG Climate Action, DG Competition, DG Employment, DG Enterprise and Industry, DG Environment, DG Health and Consumers, DG Markt, DG Trade and the Joint Research Centre

⁵ SEC(2008) 2862

⁶ http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/consultation-forum/index_en.htm

July can be found in Annex I. For both, meetings participants were provided with working documents one month in advance and were invited to comment in writing until one month after the meeting (two months after the 10 July meeting). The working documents were also sent to the secretariats of the Environment, Public Health and Food Safety (ENVI) and Industry, research and Energy (ITRE) Committees of the European Parliament.

The Consumer 2020 study⁷, carried out by the firm imrworld, provided the basis for the problem definition in this impact assessment. Rand et al conducted the "Bringing online into Line" Impact Assessment preparatory study – the source of much of the statistical analysis in the present document.⁸

2. PROBLEM DEFINITION

2.1. What is the issue or problem that may require action?

Product-specific delegated acts implementing the Energy Labelling Directive no longer achieve the full energy savings potential originally projected. This is because the share of sales via the internet - where with current implementation of the Directive, consumers are provided with less information and in a different way than in retail outlets - is increasing. In addition, an very large share of consumers buy products in retail outlets but use the internet in advance to inform their choice. "This information deficit" affects consumer choice by biasing them towards buying less energy efficient products when using the internet or other forms of distance selling. The problem concerns predominantly the internet and for the scale of the problem other forms of distance selling are of lesser importance. As indicated in the section "Consultation and expertise", this problem was foreseen during the revision of the Energy Labelling Directive and the revised Directive provides for the possibility to address the problem through delegated acts.

Evaluation shows that the business burden of off-line labelling is reducible with new technology, and thus the status quo is creating avoidable and disproportionate burdens.

2.2. What are the underlying drivers of the problem?

This section will show that the problem is due to regulatory failure, because the existing legal framework is no longer adequate. While at first sight the failure may seem a market failure providing imperfect or rather asymmetric information in the online environment (internet) compared to the offline environment (shops), the cause in fact lies in a regulatory failure because legislation prescribes a difference in information provision between these environments. In the past, the asymmetry between the online and offline was not a significant problem and symmetry would have created burdens for industry since technology and techniques to produce electronic labels and put them online was not sufficiently advanced and widespread. However, neither is true any longer. Further, the current legal framework has also the unintended consequence that those online retailers who would want to correct the

⁷ Available via: http://ec.europa.eu/information_society/newsroom/cf/itemdetail.cfm?item_id=6782

⁸ http://ec.europa.eu/information_society/newsroom/cf/dae/itemdetail.cfm?item_id=7881

asymmetric information provisions online versus offline may not be allowed to do so because this may not comply with the letter of the law.

Differences in consumer information in retail outlets and in distance selling



Figure 1: Energy label for TV's

In the case if distance selling, the information to be provided on TV's is the following:

- The energy efficiency class of the model
- The on-mode power consumption
- The annual power consumption
- The visible screen diagonal

The information has to be provided in the above order. Details on the information to be provided for other product groups in case of distance selling are presented in Annex II.

Apart from the specific order in which the information has to be provided and the requirement that it should be legible, there is no further specification on how this should be displayed. There is little systematic evidence on how the information is displayed online, but survey research indicates that there is considerable variation. In addition, the order in which the information was presented online was incorrect in 43% of cases, although the report also

notes that both the information content and the clarity of depiction tended to be improved by the altered order.

Concerning the product fiche, the typical type of information provided is in the case of TV's the following:

- Supplier's name or trade mark
- Supplier's model identifier or code which distinguishes a specific television model from other models of the same trade mark or supplier's name
- The energy efficiency class of the model
- The visible screen diagonal in centimetres and in inches
- The on-mode power consumption
- The annual energy consumption described as: 'Energy consumption XYZ kWh per year, based on the power consumption of the television operating 4 hours per day for 365 days. The actual energy consumption will depend on how the television is used.'
- The standby and off-mode power consumption or both;
- The screen resolution in physical horizontal and vertical pixel count.

This information has to be included in the product brochure or other literature provided with the product. Thus, this is available in retail outlets, but there is no provision in the product specific legislation to provide this in the case of distance selling.

Consumer choices affected by differences in information provision

For energy efficiency, the current situation means that the consumer in the distance selling environment is not provided with the coloured labelling scale, nor with the specific colour belonging to the class of the model. Thus, the consumer is not guided by the colours and the alphabetic indication does not provide information on which other energy efficiency classes are applicable to the product group concerned. The latter is important since the revision of the Energy Labelling Directive provided for additional classes 'A+', 'A++' and/or 'A+++' to be added on top of the A-G labelling in case of technological progress. For a number of product groups, some or all of these additional classes meanwhile apply. Thus, at present, for some product groups the highest class is 'A', for others it can be 'A+', 'A++' or 'A+++'.⁹

Alphabetic scale and colour-coding are key to the appeal and clarity of energy labelling.⁹ However, the consumer in distance selling is not presented with a recognisable and consistent basis for comparison which negatively influences purchasing behaviour of consumers buying or researching online compared to in retail outlets. The fact that only a letter is presented may give lesser prominence to energy efficiency in the consumer's choice compared to the

⁹ Research on EU product label options, Appendix 1.3.6, Ipsos MORI, October 2012

situation where the whole label is visible. Further, the fact that not the whole range of other energy efficiency classes that are applicable to the product group concerned are presented, could result in the consumer selecting a product of up to three classes lower in distance selling than in retail outlets. Visual examples of the display of energy-related information that highlight this problem are provided in Annex II.

Concerning the product fiche, there is little information how this influences consumer choices, but the absence of the fiche in the case in distance selling is widening the information discrepancy between buying or researching online and in retail outlets.

The share of online purchases and purchase decisions is increasing

There is an overall trend towards buying major appliances on the internet. Figure 2 shows baseline data for the proportion of customers buying goods and services online in the EU27. This is not necessarily the same as the proportion of products covered by the Energy Labelling Directive bought online or proportionate expenditure shares of the online environment, but it is a most relevant indicator for the number of individuals making purchases or purchase decisions online. Other forms of distance selling do not show the same significant upwards trend.

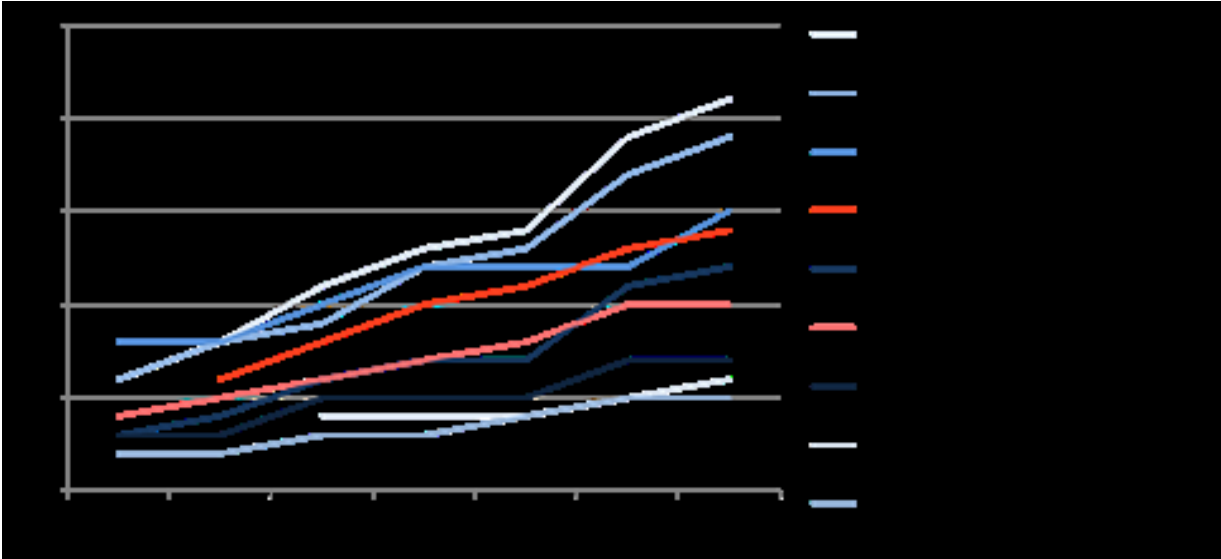


Figure 2: Proportion of individuals who ordered goods or services over the internet for private use, 2004-2010, by type of goods EU 2710

For most transaction types the percentages doubled in the period 2004-2010 and in some cases more than tripled in those six years. The proportions purchasing household, computer and electronic goods covered by the Directive approximately doubled over the period, and in 2010 stood between 7% and 14%. In the UK between 11% and 24% of energy-related products were bought online in the period 2010-2012, with the exception of computers for

¹⁰ Source: Eurostat (http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_ec_ibuy&lang=en; press select data)

which this figure was already more than 80%.¹¹ The UK on-line market tends to be somewhat more advanced than most Member State markets for historical reasons and therefore gives a strong indication of future trends and of the urgency of the problem. These trends are expected to continue and even accelerate, because of the explosive growth in the use of mobile devices and apps to browse and purchase.

In addition, increasing proportions of purchasers seek information online before they buy a product in a shop.¹² Both energy labels and internet-derived information are important factors in major appliance purchases, as is shown in Figure 3. The growing influence of online information (as “trusted source”) on purchase decisions is also clearly reflected in the results of surveys underlying the 2009 Green Index report (see Figure 4). In short there is no reason to suppose that online browsers or shoppers are any less affected by being presented appropriate energy efficiency information than are those who make their purchases and purchasing decisions exclusively in physical shops. If anything appropriate on-line presentation of data may be a greater influencer and is certainly a growing one. Thus, the trends in Figure 2 provide lower bound estimates of the numbers potentially affected by the information discrepancy online compared to in retail outlets, because they do not include the significant numbers¹³ who make purchase decisions online but conclude the purchases offline.

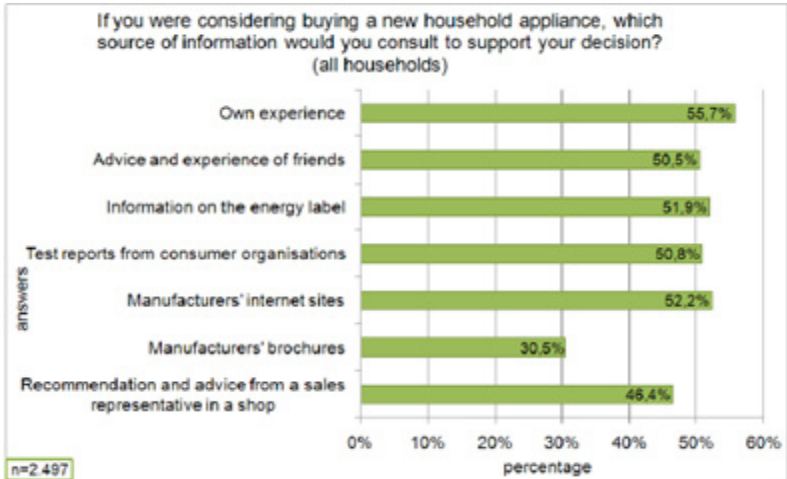


Figure 3: Sources of information for major appliance purchases (EU-27)¹⁴

¹¹ Source: Consumer Focus 'Under the influence? Consumer attitudes to buying appliances', 21 December 2012 (<http://www.consumerfocus.org.uk/publications/under-the-influence-consumer-attitudes-to-buying-appliances>)

¹² The opposite phenomena also exists i.e. purchasers browsing in the physical world but buying on-line, but is marginal in the EU, though more pronounced in the USA.

¹³ [Source Consumer2020: Definitive figures are difficult to come by, but as the costs of purchases exceed 200 euros there is a strong body of evidence to show that over 90% of these purchases are pre-searched or browsed on line.](#)

¹⁴ Derived from Refrigerator, Washing Machine and Dishwasher Preparatory Studies

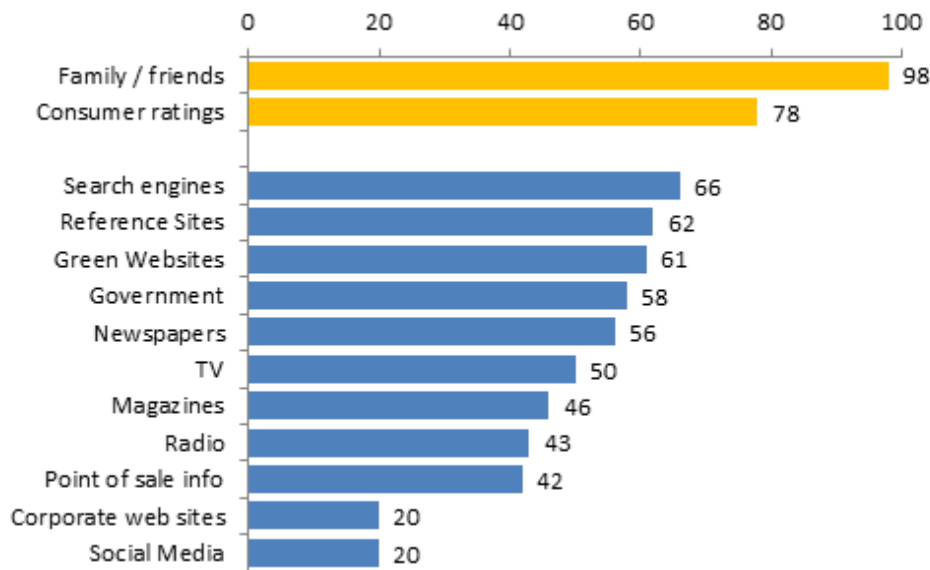


Figure 4: Trusted sources of environmental information¹⁵

2.3. Who is affected, in what way and to what extent?

Consumers are affected, because if due to online purchasing or online support to purchasing decision making they select appliances that are less efficient than they would otherwise have bought, it will likely cost them more over the lifecycle of using the product, because of the higher energy consumption of the product. The public at large is affected, because such higher energy consumption means higher emissions of greenhouse gases and resulting negative environmental effects.

Manufacturers are affected because the investments they make in innovation for higher energy efficiency of products are largely driven by the possibility to compete with each other provided by the energy label. If, because of increased online selling, there is a fall of the sales of the most efficient appliances, they may not see return on their investments and be less inclined to make further investments in the future.

2.4. How are existing policies and legislation affecting the issue?

The recently adopted Energy Efficiency Directive establishes a common framework of measures for the promotion of energy efficiency within the EU in order to ensure the achievement of the EU's 2020 20 % headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date. The Directive emphasizes the considerable energy-saving potential from energy-related products and calls for the implementation of ecodesign and energy labelling to be accelerated and widened.

2.5. Baseline scenario: how will the issue evolve in the absence of intervention?

For the construction of the baseline scenario a limited number of specific products were selected to facilitate the analysis: washing machines, dishwashers, refrigerators and freezers.

¹⁵ October 2009: Source Green Index

They were selected¹⁶ on the basis of end-consumer influence over product choice and availability of suitable data:

- Information on the efficiency rating distribution of purchases;
- Information on the proportion of purchase decisions made on-line;
- Time-series information on the stock of appliances; and
- Sufficient time-series on purchase behaviour under a product-specific Delegated Act.

There are ample data for the four products selected, which account for a significant portion of overall energy use. Further details on this selection are provided in Annex III.

The resulting impacts were computed using a model (see Annex IV) based on projections of the following elements:

1. new appliance purchases by year, based on macroeconomic assumptions;
2. ‘channel’ analysis of the proportion of purchases decided and/or completed online, based on historical time-series data projected into the future using trend modelling;
3. distribution across energy rating of purchases in each channel, based on a parametric time-series model of the impacts of specific policy options on historical trends;
4. use of these projections to adjust the distribution of energy efficiency levels (as measured by ratings) in the stock of appliances; and
5. conversion of the results to energy use, energy cost and CO₂ emissions, using product-specific projections of per-rating impacts obtained from the product-specific Preparatory Studies for the Ecodesign and Energy Labelling Directives.

Figure 5 shows the energy consumption (TWh/yr) until 2020 for the four selected products in the EU-27¹⁷ assuming no change in implementation concerning the online provisions of the product-specific legislation under EU Directive [2010/30/EC](#). Additional modelling data taken into account, such as average equipment age, breakdown of sales by energy efficiency class, etc. are provided in Annex IV.

¹⁶ Further discussion in Annex III.

¹⁷ See Annex IV for table with associated emissions (MTCO₂/yr) and energy cost (€B/yr)

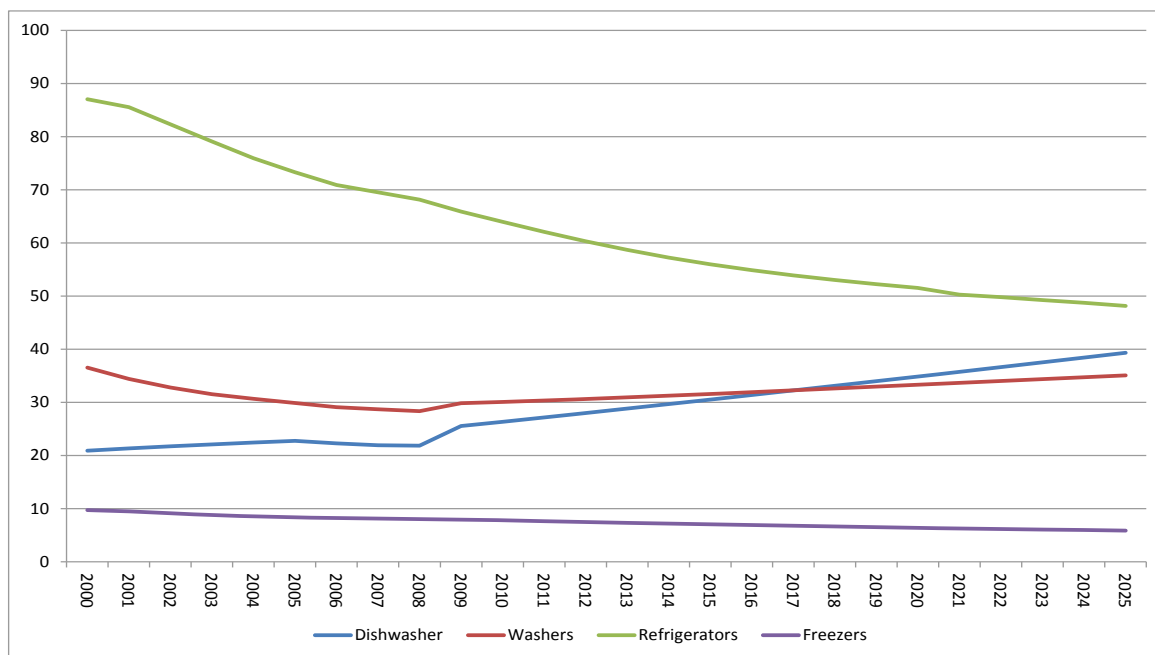


Figure 5: Baseline evolution of energy consumption by product: washing machines (W), dishwashers (D), refrigerators (R) and freezers (F), EU-27¹⁸

Based on the data in Figure 5 above, total energy consumption from appliance use (with the exception of refrigerators) is not likely to decrease before 2020. It is also clear from section 3.2 that online appliance purchases are increasing.

2.6. Should the EU act?

The case for further action on online energy efficiency information provision is primarily based on the importance of ensuring consistent application of the provisions of Energy Labelling Directive throughout the EU's Single Market. Such action would ensure that what is applicable to the offline market is also applicable to the online market. Article 7 and 10 of the Energy Labelling Directive allow this to be done through delegated acts under the Energy Labelling Directive.

Given that the online market is growing, that online information is increasingly used by purchasers and that both trends can be expected to continue and even accelerate as the digital literacy of European consumers improves and mobile internet device market penetration continues to accelerate, it is important to level the playing field between the offline and online environments by removing as far as possible any barriers and disparities. This includes the requirements:

- To ensure uniformity of information coverage and content between offline and online environments;

¹⁸ Source: Euromonitor International - drawn from Consume Appliances reports, specifically "Table 19 Major Appliances by Distribution Format: % Breakdown 2005-2010"

- That no specific or additional action needs to be taken by online purchasers to be presented with the relevant energy efficiency information as they browse, compare and purchase; and
- That the provisions be as technology neutral as possible (i.e. regardless of online access channel or proprietary product).

It is also clear that online cross-border purchases make the online market more pan-European (i.e. more "Single Market") than the offline market; the latter being more anchored to the physical location of retail outlets. This is not limited to cross-border e-commerce in the strict sense; comparisons are more likely to take place across borders than are purchases – hence consistency is particularly important. On the other hand, direct purchases from suppliers do have a strong pan-European aspect; data from Forrester Research¹⁹ shows that online visits to suppliers' websites have a very high conversion rate (to purchases) - 36% compared to 1-4% for general e-commerce-commerce.

3. OBJECTIVES

Objectives are directly derived from the provisions of EU Directive 2010/30/EU, and specifically aimed at the online environment.

The general objectives are to:

- Reduce energy consumption and CO₂ emissions due to use of energy-related products bought or researched online following Community environmental priorities, such as those set out in Decision 1600/2002/EC or in the Commissions European Climate Change Programme (ECCP).
- Promote energy efficiency and thus contribute to security of supply in the framework of the EU objective of 20% reduction in the EU's energy consumption by 2020.
- Improve functioning of the Digital Single Market.

The specific objectives and operational objectives are to:

- Increase the share of sales of energy efficient appliances amongst the total number of appliances that are bought online through more informed purchase decisions online.
- Promote consumers' energy efficiency awareness and positively influence shopping behaviour.
- Facilitate the development of third party business models based on the creative re-use of energy efficiency information (e.g. search engines, independent comparison services, etc.); in general and in particular for SMEs.
- Impose no excessive administrative burden on merchants.

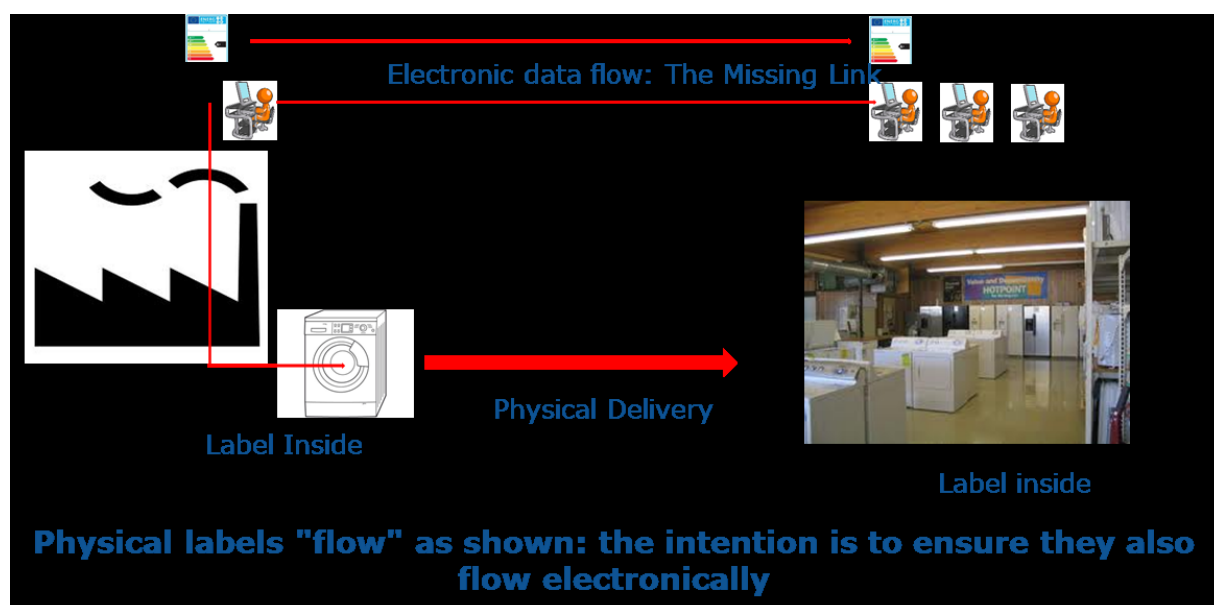
¹⁹ Source: Mulpuru et. al. (2010)

4. POLICY OPTIONS

The policy options concern the *type of intervention* i.e. the policy instrument to be used for changes or additions to the current way of providing consumers with energy efficiency information of energy-related products online. Since the impact assessment supporting the proposal for a revised Energy Labelling Directive already addressed the issue in general, the current impact assessment is proportional and therefore the impact analysis will concern specific sub-options only.

For the *content of the intervention* the following options were identified:

- the present situation of online information provision (which is de facto reflected below by the type of intervention option that represents the baseline)
- the option of displaying the energy label and the fiche online next to the price of the product. This option is discarded, because this would leave on-line dealers with little visual space to display the product itself. It would therefore also have encountered strong business opposition.
- the option to display a the energy class by the appropriately coloured arrow upon which after click through/mouse roll-over/touch screen expansion the label would be displayed.²⁰ For the fiche a similar mechanism would apply, which instead of an arrow would use an object 'Product fiche' (this option is reflected below in the type of intervention options other than the baseline). Suppliers would be required to provide for the missing electronic data flow as indicated in Figure 6. Further detail on the technical content of the intervention is provided in Annex V.



²⁰ As illustrated at <http://www.connemaraprogramme.ie/ecosearch/index.html>

Figure 6: The electronic data flow necessary for options 1, 2a and 2b

4.1. Option 0: No additional action

This is the baseline option which means no additional action beyond the current provisions in the product-specific delegated acts. This option would mean that online consumer information provision on energy efficiency would for those energy-related products that are already regulated remain the same as it is now (as detailed in Annex II). For further energy-related products for which energy labelling regulations would be developed the online information provisions would be similar to those of the products already regulated. This option would continue to provide online information on energy efficiency of energy-related products, but it would not be uniform with and of the same persuasive quality as the information provided in shops. No stakeholder expressed preference for this option. This option is therefore discarded, but included in the impact analysis as a baseline with which to compare the other options.

4.2. Option 1: Voluntary action by suppliers and dealers with guidance from the Commission

In this option suppliers and dealers would be asked to undertake voluntary action. This would involve suppliers and dealers agreeing on a standardised way to provide and display the energy label and the fiche online. The Commission would issue guidance for a standardised format.

This option leaves the details of implementation to industry stakeholders, although neither manufacturers nor dealers have expressed interest in this option (one Member State expressed preference for this option, see Annex I). The 2008 impact assessment for the proposal for the revision of the Energy Labelling Directive stated that "*Under voluntary schemes, companies whose products perform badly in terms of environmental impact are unwilling to display a label on their products, catalogues, media, Internet, etc., as it would negatively affect sales.*" Therefore, compliance and coverage (of products, consumer groups and marketing channels) may be less consistent, and provide less systematic and reliable information as to how successful the initiative is in terms of changes in information quality and availability, consumer behaviour and impacts on product design. The information provided will probably be less standardised and comparable, and it may not be in the interests of competing firms to ensure that the information provided is easy to understand and compare. The nature of the information is likely to be shaped by marketing considerations, which may make it less trusted by consumers. There are also likely to be uneven patterns of implementation; pure-play outlets (which include many SMEs) may progress more rapidly in response to the competitive pressure they face from hybrids and the difficult regulatory and tax conditions they face.

This option would require amendment of all the existing delegated acts on energy labelling deleting their current provisions related to distance selling, at least for Internet selling. As set out above, it would however not guarantee that it is replaced by a uniform alternative covering the entire sector and thus undermine the objectives of the Directive. Therefore, this option is discarded.

4.3. Option 2: Regulatory requirement for showing the energy label online

This option would mean that suppliers and dealers will be obliged to ensure display of the energy label and fiche online. This can be done in two ways, represented by the sub-options 2a and 2b.

Sub-option 2a: Require display of the energy label and fiche online through a delegated act under the Energy Labelling Directive

The Commission would adopt a delegated act that requires display of the energy label and fiche online. This option would mean that suppliers and dealers will be obliged to ensure display of the energy label and fiche online according to the specifications provided in the delegated act. This would be instead of the current information provisions required. Once the delegated act is adopted suppliers and dealers would be given a certain transition time to facilitate the change, e.g. 6 months to accommodate this within normal website upgrade cycles. This is the preferred option of the consumer organisations and several Member States and industry stakeholders i.e. manufacturers and e-commerce dealers.

Sub-option 2b: Propose to require display of the energy label and fiche online through revision of the Energy Labelling Directive

This option would be similar to option 2a, but the specifications ensuring display of the energy label and fiche on the internet for all energy-related products for which specific legislation is developed would be laid down directly in the Directive, through a Commission proposal for a revised Energy Labelling Directive. The timing would follow the foreseen review of the Directive in 2014, after which transposition of a new Directive, following negotiations on a Commission proposal, would not be final before 2017.

This option would deviate from the mandate provided by the legislators in the 2010 revision of the Directive, but is nevertheless included in the impact analysis, because some Member States and one industry stakeholder expressed preference for this option (see Annex I).

5. ANALYSIS OF THE IMPACTS

The impacts of the options on consumption patterns can be decomposed into a) providing more usable, relevant and comparable information when decisions are made and b) shaping of information provision (e.g. by presentation or reinforcement through repetition, certification, etc.) to make it more influential. Although all options for intervention are aimed at making current energy label and fiche information available only (barring option zero – no further intervention), all offer the possibility of further innovations in the form and nature of information provided.

Options 2a and 2b aim at a common landing place (complete application of the label and fiche in the online environment, consistently implemented across products, market segments and countries) but differ primarily in the rate at which they get there.

The quantified impacts refer to the four specific products included in the baseline analysis. The overall impacts of options 2a and 2b compared to the baseline in those areas are higher as the options affect other energy-related products as well. Since this affects option 2a and 2b in the same way, the provided quantified impacts are sufficient to compare the options and to provide the order of magnitude of the impacts concerned.

5.1. Impacts of Option 0, no additional action (included for comparison only)

Impacts on Consumers:

- Uneven access to reliable and interrogable energy efficiency information online;
- More reliance on other sources/actors which may provide biased/inaccurate information;
- Low and decreasing awareness of energy efficiency as online and hybrid shopping behaviour increases;
- Poor purchase decisions concerning energy efficiency; and
- Not likely to purchase energy efficient products.

Impacts on Dealers:

- No short-term cost or risk, however:
- Information may or may not be provided in simplest legally required form with limited utility;
- Sales may fall as online and hybrid purchasing grows without accessible or reliable energy information;
- Dealers are less likely to deal in energy efficient products;
- There will be little incentive to innovate in information provision;
- Innovative third party business models will receive little or no stimulus; and
- E-commerce, including cross-border within Europe and opportunity for smaller dealers, will not be appreciably enhanced.

Impacts on Suppliers

- No short-term cost or risk, and information will continue to be provided in the simplest legally required form, however

- Demand (especially for top-rated products) may weaken²¹ as online and hybrid purchasing grows without accessible or reliable energy information;
- Incentives to accelerate redesign of products towards energy efficiency will be weakened or distorted;
- There will be little reason to innovate in information provision;
- Innovative third party business models will receive little or no stimulus;
- E-commerce, including cross-border within Europe and opportunity for smaller dealers, will not be appreciably enhanced; and
- SMEs may face access barriers in gaining access to customers served by large hybrid retailers

5.2. Impacts of Option 2a, mandatory display of the label online through delegated act

Quantitative impacts under Option 2a²²:

Over the effective policy period (starting in 2014), and assuming trend growth in appliance ownership, compared to the baseline, option 2a will result in the impacts quantified in section 6.

Impacts on Consumers:

- Interrogable energy efficiency information online. No reliance on other sources/actors which may provide biased/inaccurate information;
- Reinforcement of label impacts through ubiquity;
- Increasing awareness of energy efficiency as online and hybrid shopping behaviour increases;
- Greater scope for energy efficiency to influence purchase decisions in the medium to longer term;
- Greater likelihood in the medium to long term of purchasing default energy efficient products; on the other hand;
- Impacts are further enhanced by use of additional (e.g. mashup) information, societal reinforcement through social media and real-time hybrid purchasing using mobile access for search and comparison simultaneously with in-store shopping;
- However, there is a risk of short-term price increases to trade off against life-time energy cost savings.

²¹ Such products often trade off higher purchase price against lower operating cost; without consistent energy use information they will be disadvantaged in online competition with lower-priced alternatives.

²² See Annex VI for details. Note that (currently) top-rated appliances are: dishwashers – A; washing machines – A+ and A (combined due to data limitations); and cold appliances – A++ and A+ (combined).

Impacts on Dealers:

- Enhanced channel management and linking – more switching between offline and online channels (hybrid shopping behaviour);
- More efficient information flow and tracking in supply-demand value chain;
- A more level playing field for small dealers;
- Increased sales of energy efficiency products as online and hybrid purchasing grow together with accessible and reliable energy information;
- Scope for innovation in new/better formats for information;
- Some market segmentation as ‘high-service’ online retailers provide more or more accessible information;
- Boost to third party business models;
- Boost to e-commerce, including cross-border intra-European trade;
- Potential short-term cost or risk arising from the new obligation, though this can be met using scanned labels.
- No additional cost to dealers;
- Enhanced information provided with good utility, including the chance to add in additional information from third parties and customers;
- Accelerated product replacement cycles towards greater energy efficiency and gradual spread of adoption and use of rankings across all classes of energy-related product.

Impacts on Suppliers:

- Small suppliers can highlight eco-performance;
- Increased demand for energy efficiency products as online and hybrid purchasing grows together with accessible and reliable energy information;
- Incentives to redesign products towards energy efficiency;
- Some market segmentation as ‘high-service’ online retailers provide more or more accessible information;
- Boost to third party business models;
- Boost to e-commerce, including cross-border intra-European trade;
- Some potential short-term cost or risk arising from the new obligation, though this can be met using current labels;

- Enhanced information provided with good utility, including the chance to add in additional information from third parties and customers; and
- Accelerated product replacement cycles towards greater energy efficiency and gradual spread of adoption and use of rankings across all classes of energy-related product

It is particularly attractive for small and medium sized enterprises (SMEs) operating in the e-Commerce environment as implementation would be integrated organically into their natural business cycles – as manufacturers begin to provide the information required they simply display it on their websites - as they do any other data coming from suppliers – in the standardised format and as sent by the suppliers.

5.3. Option 2b – mandatory display of the label online through revision of the Energy Labelling Directive:

Quantitative impacts under Option 2b²³:

It is estimated that under this option the requirement would take effect in 2017. It will result in the impacts quantified in section 6. While in 2025 the yearly impact is the same as for option 2a, the average yearly impact over the period 2014-2025 is different, since this the requirement would apply later than under option 2a.

Impacts on consumers, dealers and suppliers

These impacts would be the same as under option 2a, though with a time delay. Further, this option would not embrace the potential of the EU coming out of the current recession. Consumers postpone discretionary purchases during difficult times. Figure 7 below shows this for the case of consumer electronics – which is applicable across all discretionary appliance spending.

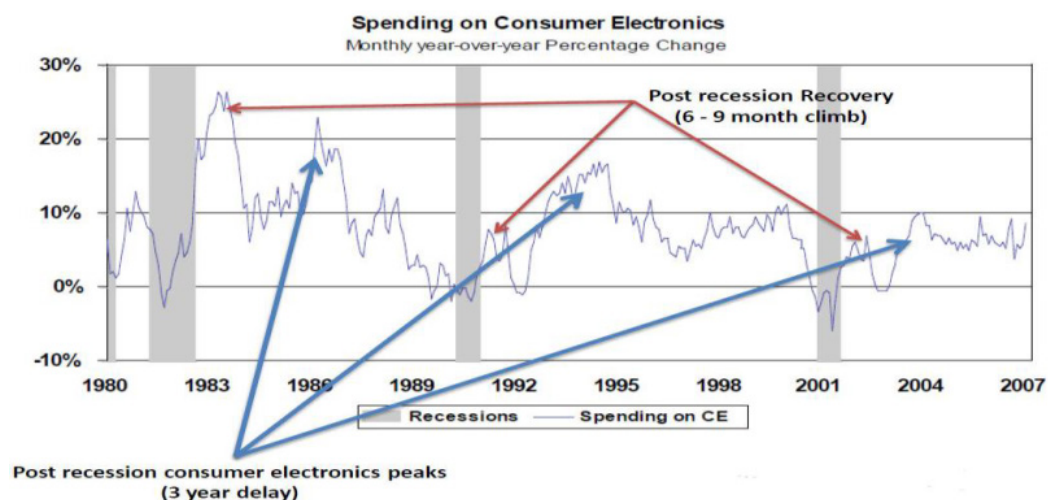


Figure 7: Consumer Delayed Spending on Consumer Electronics – past three recessions²⁴

²³ See Annex VI for details. Note that (currently) top-rated appliances are: dishwashers – A; washing machines – A+ and A (combined due to data limitations); and cold appliances – A++ and A+ (combined). This option takes effect by 2014.

²⁴ Source: Consumer 2020 study

5.4. Comparison of short term impacts across options

The primary short term impact across all options is the change in purchases towards better-performing (and higher-rated, in some cases) energy-related products. Contributing to this are short-term reallocation of purchase and search behaviour among hybrid ‘channels’, shifts among types and sizes of dealer, rebalancing of price structures in response to altered patterns of demand, and altered profit margins. The impacts can be roughly decomposed into primary and secondary impacts.

Primary impacts derive from changes in consumer purchasing behaviour, which reflect:

- Aggregate demand for various types of appliance across different groups defined by age, income and other variables – this is assessed by decomposing demand into: new appliances (increasing penetration), planned replacements (length of replacement cycles) and emergency replacement (driven by appliance failure).
- The allocation of this demand to different energy efficiency classes – this depends on: underlying preferences; the exposure of consumers to information and a range of choices; the degree to which such information is easy to use, trusted and regarded as relevant; the ‘deliberation’ with which choices are made; and the prices (purchase and operation) of different efficiency classes.
- The allocation of purchase behaviour across the four ‘channels’ in Table 1 and resulting changes in the purchasing behaviour of customers in each channel

Table 1: Purchasing channels

	Online purchase	Offline purchase
Online search	A) Customers transacting wholly online see information ‘for first time’ under option 2 and are therefore most affected	B) Customers searching online but buying offline see information before narrowing their choice and are second most affected
Offline search	C) Customers searching offline but buying online are reminded of information before purchase and are least affected	D) Customers transacting wholly offline are only affected indirectly e.g. via induced price changes, etc.

***NB the relatively new trend of buy online, pick-up in store is not factored in – but clearly this behaviour adds to rational for online labelling.*

The impact assessment supporting the proposal for the Energy Labelling Directive concentrated on the impacts obtainable through channel D. Impacts of the online extension can be approximated by determining the proportion reallocated to the other channels as a result of exogenous societal trends and using the behavioural literature and the characteristics of the options to determine the change in impact for each of the other channels in terms of patterns of realised demand for products of different energy ratings²⁵.

²⁵ See Annex IV.

Figure 8 shows the proportion of top-rated (A and A+) washing machines purchased under the four options²⁶. It clearly demonstrates the strong acceleration due to the options, especially Option 2a.

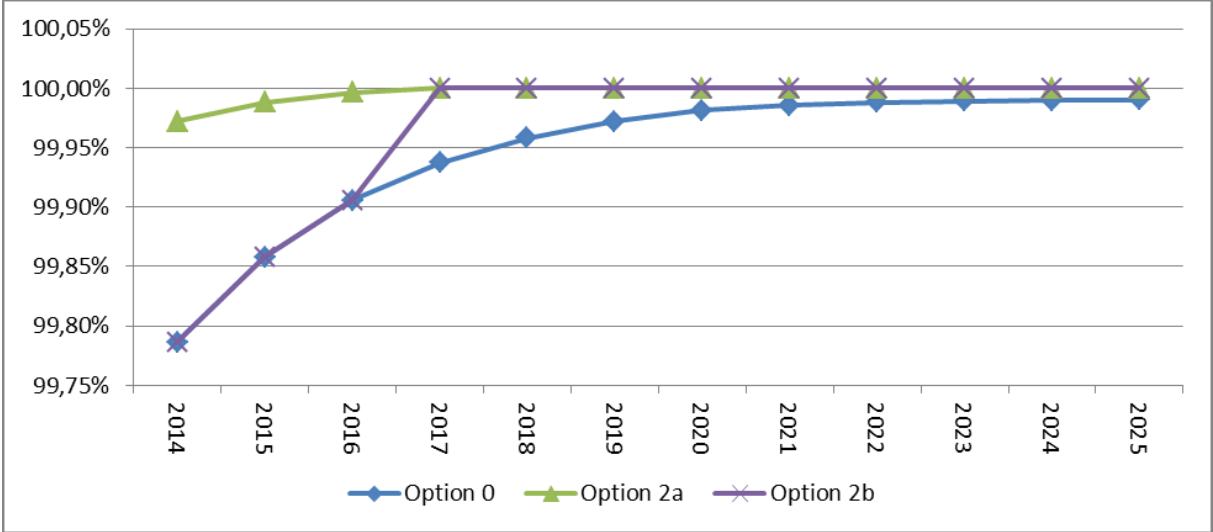
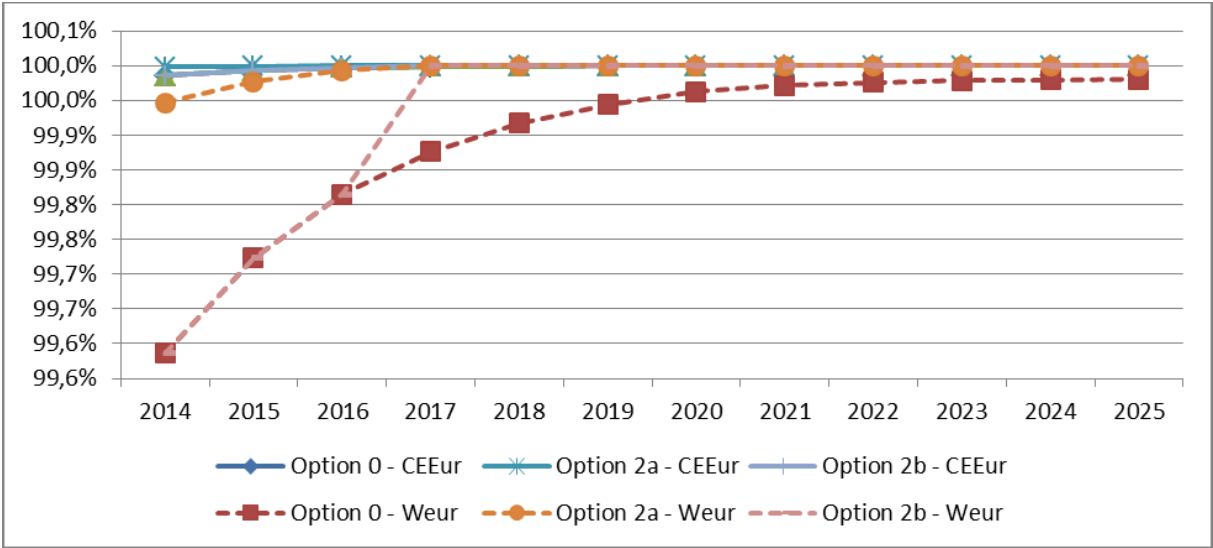


Figure 8: Growth in purchases of top-rated Washing machines

Figure 9 contrasts the purchases of top-rated washing machines under the four options in Western Europe (“West”, dashed lines) and Central/Eastern Europe (“East”, solid lines), showing that the more recent increases in Central/Eastern European standards of living (and possibly greater attention to economic or environmental aspects of product design) results in a higher average environmental efficiency of new appliances and (consequently) a less pronounced policy impact²⁷.



²⁶ Figures for the other appliances follow a similar pattern, but A++ Refrigerators and Freezers increase steeply from a low base, with less difference between Options 1-2, while Dishwashers are already almost uniformly of the highest class (A) for which historical data are available.

²⁷ Note, however, that these projections do not consider improvements within ratings categories.

Figure 9: Purchases of top-rated Washing machines in Western (WE) and Central/Eastern (CE) Europe

However, a shift in new purchase composition towards more efficient appliances only tells part of the story; net effects on energy use, emissions and energy cost are influenced by existing stocks of appliances, fuel prices and other factors such as disposable income changes that affect overall demand for new energy-related products. The overall growth of appliance ownership has a significant influence on the impacts of the options. Figure 10 and Figure 11 show the trajectories of energy consumption under two different scenarios; trend growth in appliance ownership and constant appliance ownership

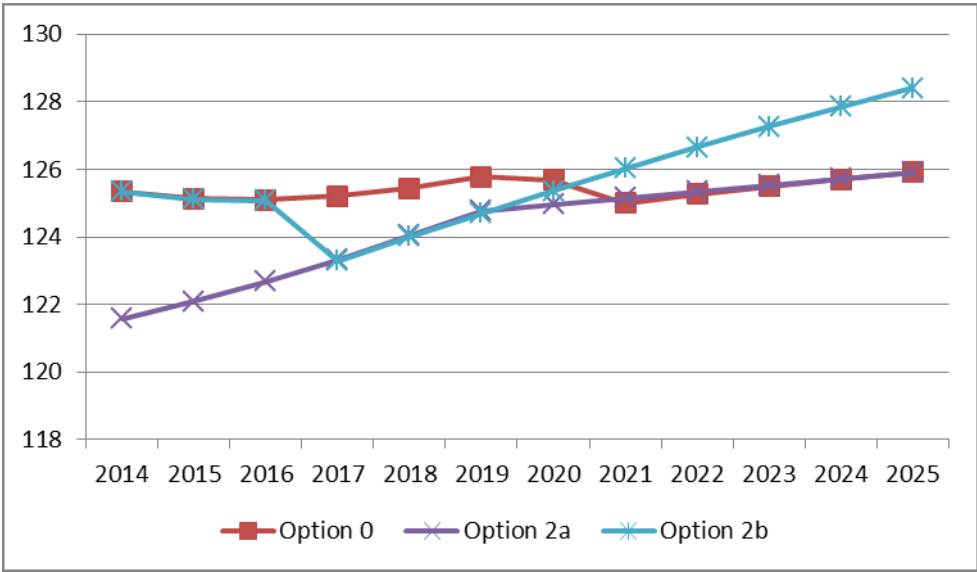


Figure 10: Energy use with stock growth

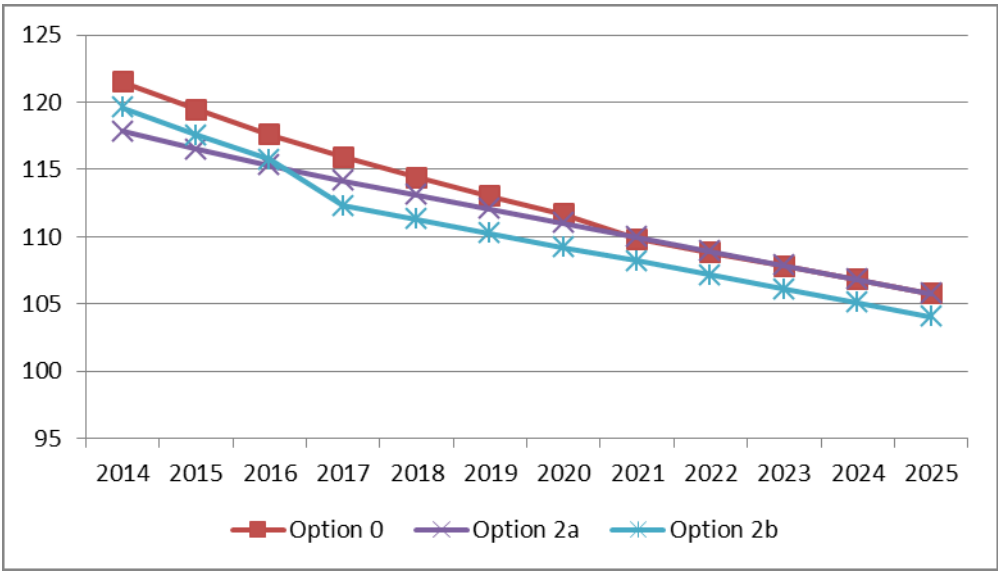


Figure 11: Energy use with constant stock

This shows that the impacts of the online labelling options are greatest in the near-term; they accelerate existing trends towards more energy efficient appliances. Trend growth in appliance ownership (especially in countries with low levels of current ownership) will

eventually erode these gains. However, these projections depend on a range of assumptions about income growth (following the pattern of the last decade) and energy prices (constant)²⁸. Further detail and data on short term impacts are given in Annex VI.

The sensitivity of the results to underlying assumptions was assessed by exploring alternative economic and policy scenarios²⁹. Briefly, the scenarios and variables considered include: energy prices and appliance stock growth and replacement rate. In addition, the modelling exercise examined the effect of more or less rapid growth in online appliance choice and the speed of convergence of online and offline purchases where the decision was made online and delayed introduction of policy options 2a and 2b. The scenarios involved:

Table 2: Sensitivity analysis scenarios

Scenario\variable	Energy prices	Stock growth and replacement
Business as usual	0.17 €/kWh	trend ³⁰
Faster recovery	0.14 €/kWh	Trend + 2%
Prolonged recession	0.2 €/kWh	Trend - 2%

These variations produced proportionate changes in the level and timing of projected purchases of top-rated appliances and the associated energy and cost impacts. They did not affect the ranking of options. In view of the conflicting evidence relating to the impact of recession-driven changes in disposable income levels and relative energy prices (see Figure 13) and the indirect connection to the specific impact of online information provision on appliance purchases, the impact of energy prices on the use of purchased appliances was not assessed.

5.5. Comparison of medium to long term impacts across options

The options have four direct medium- to long-term effects.

The first is to sustain the impacts of the current Directive by improving the availability and use of energy efficiency information, in particular by reinforcing socially-mediated changes in attitude and consumption patterns. This can be measured using tracking data on the distribution of sales jointly across purchase ‘models’ (on-/offline/hybrid) and energy efficiency class. The power of social media to catalyse opinion formation indicates that this effect is likely to be substantial (as it has been with other forms of comparative information).

The second is to produce a much richer set of relevant data and evidence than are currently available in order to measure compliance, link changes in information provision to changes in market efficiency and to quantify changes in relative energy performance to market outcomes (market share and net revenues).

²⁸ The model produced for this study allows detailed sensitivity testing; roughly, increases in real energy prices will magnify the impacts of online labelling. Reduced growth of disposable income has both positive effects (increasing the influence of operating cost on purchases) and negative effects (delaying stock replacement).

²⁹ Detailed numerical computations not included here.

³⁰ Trends were: i) Washers: WE - 0.98%; CEE - 0.59%; ii) Dishwashers: WE - 2.54%; CEE - 7.11%; iii) Refrigerators: WE - 0.80%; CEE - 0.63%; and iv) Freezers: WE - 0.59%; CEE - 3.81%.

To some extent this will be a consequence of the growth of e-commerce and the provision (or otherwise) of information in easily-tracked online settings. Beyond this, web crawling tools and surveys can be used to measure the expected growth in information and comparison intermediation (whether by suppliers, dealers or third parties) and the emergence of innovative forms of information (especially where encouraged – or at least not penalised – by the option chosen).

The third is to reinforce the competitive edge for better products. In the medium term, this can be measured by the gap between the cost of improved performance and the premium it attracts³¹.

Finally, the adoption of such implementing measures in Europe is likely to change the medium-term competitiveness picture for EU suppliers and dealers and the level of environmental performance throughout the world. Because the environmental efficiency information can be reproduced by suppliers at near-zero cost, European suppliers operating on world markets can voluntarily ‘push’ this information into their worldwide marketing literature. Such information is most attractive to wealthy and educated consumers capable of replacing appliances sooner; its relative novelty in markets without similar Directives will attract their attention (in accord with the Salience principle). As a result, the commercial return to providing such information will be even higher in the non-European markets to which online channels (for product information as well as retail sales) give access.

At the same time, non-European manufacturers wishing to sell in the European market will have to produce the required information. When they have produced the information (and their authorised dealers and other retail outlets begin to demand the right to use it), they will be able to use it in their home and other foreign markets. Manufacturers who see the potential added value from a stakeholders’ perspective will not only want to comply, but will wish to benefit from the added value it can bring.

The best suppliers will be attracted to European markets by their increased (if short-lived) ability to capture part of the gains from trade in more efficient products. Of course, excess profits for both European and non-European firms in both European and non-European markets are likely to be transitory. The long-run consequences should be the conversion of these interim profits to societal gains; faster technological energy use improvements, better energy efficiency throughout the global economy as stocks are updated, informationally more efficient markets and enhanced consumer awareness of the ecological, environmental and energy ‘footprint’ of the use of energy-related products, which reinforces environmental policy goals through improved purchasing, more efficient use patterns and – for dealers - greater compliance or improvement beyond the levels specified in the chosen option.

Further detail on medium- to long-term impacts is given in Annex VI.

³¹ Like reliability performance, this is likely to exert a reputational ‘halo effect’ on companies with outstanding performance for some models – which then become the reference for shoppers - or uniformly good performance across all models. The premium is discussed further in Annex VI.

5.6. Administrative and compliance costs

Costs for government

There are no significant additional administrative costs associated with the implementation and enforcement of any of the options. There is no additional enforcement or monitoring cost associated, because enforcement provisions are already included in product-specific delegated acts. The existing Directive requires Member States to establish and operate market surveillance, monitoring and enforcement capabilities. This already includes the online environment. Surveillance and monitoring of on-line information is less costly than that of 'off-line' counterparts. There may be transitional costs to add new capabilities or to obtain use of shared services from other agencies charged with on-line market surveillance. These costs will vary by country; they are provisionally estimated at €0.1 million per Member State for options 2a and 2b³².

Costs for manufacturers, dealers and others

These proposals do not change the coverage of the Directive in terms of products or create obligations to produce new information. Therefore, they are not expected to give rise to significant implementation costs. The costs of producing graphics and other electronic files required to convey the necessary label and fiche is already sunk when complying with the existing legislation. For options 2a and 2b, the transitional period allows costs to be further reduced by incorporating any changes in the usual business process upgrade cycle.

Implementation of all options does carry the obligation to ensure that the information is provided in a legible, comprehensible and comparable fashion independently of end-user Internet access device; this may create web design and consumer behaviour study costs. The magnitude of this is not estimated, because none of the options require or restrict manufacturers from carrying them out for their products, dealers from carrying them out across their product range or search and comparison site providers developing means of collecting the necessary information and presenting it in a suitable fashion. Providing the information to consumers once the design stage is completed bears no additional cost; it will occur as part of dealers' periodic updates.

6. COMPARISON OF THE POLICY OPTIONS

Until now, the Energy Labelling Directive and its implementing measures address online sales as any other distance selling for which display of the energy label was not required, although a number of information parameters featuring on the label had to be provided in a particular order, but without specifying the form. Internet sales used to be a small proportion of the market for products covered by the Directive and therefore did not require specific treatment. This situation has clearly changed. Online sales form an increasing proportion of overall purchases, and ever more consumers seek information online prior to purchase, regardless of

³² Based on cost estimates in the Impact Assessment for the proposal for Directive 2010/30/EC related to provisions in articles 4 and 7.

where they conclude their purchases. This general trend is particularly marked for the complex and expensive items covered by the Directive.

This report explored four options

- Option 0 – no additional action;
- Option 1 – voluntary action by suppliers and dealers to display the energy label online, with guidance from the Commission
- Option 2a – Require display of the energy label and fiche online through delegated act under the Energy Labelling Directive.
- Option 2b – Propose to require display of the energy label and fiche online through revision of the Energy Labelling Directive (review due 2014).

Option 0 does not achieve the objectives. This option would continue the situation of uneven availability of information online compared to 'offline'. The option was therefore discarded.

Option 1 was discarded because it would not guarantee a uniform approach covering the entire sector.

Option 2a seems optimal from the perspective of stakeholders; it is framed as a clear specification for the content and format of the information provided and an explicit invitation to provide equivalent or superior variants. There are clear indications that investment costs for merchants would be relatively low and easily offset by even modest increases in the quantity or (environmental) quality of goods sold. Furthermore, much more can be achieved when the specific opportunities offered by an online, networked environment are used:

- Additional information and related functionalities (e.g. applications that let consumers integrate their purchases and predict costs in a more accurate manner) can be linked directly to the label;
- Online data (including third-party data) can easily be used for comparisons. By requiring data to be made available in a form that can easily be interpreted and reused by both man and (comparison) machine, potential consumers will be able to make informed decisions that include a more balanced and salient insight into the eco-efficiency of the products;
- Analysis of behaviour under this option can greatly improve our understanding of how customers structure and exchange information (especially information relating to public goods such as the environment); moreover, price data will provide a more accurate reflection of willingness-to-pay for environmental performance as a result of the high, consistent and observable information factored into purchase decisions³³.

³³ For example, environmental options based on surmise or opinion are difficult to distinguish from strong views based on reliable and commonly-observable hard data. Much the same has been noted for product safety information.

Option 2b is rejected as only serving to delay the benefits that would accrue to industry, dealers, consumers and the wider energy efficiency and climate change agendas.

Thus, option 2a is preferred: requirements for online display should specify that the same information be provided online as offline.

The following tables illustrate the impacts of the options on the purchases of top-rated appliances (Table 3) and emissions, energy use and energy cost of operation (Table 4) relative to the baseline. These computations focus on the four types of appliance for which the most complete and reliable data were available. As a result, the impacts shown considerably understate the impacts to be expected when improved purchases of other energy-related products are taken into account. The purchase composition projections are predicated on trend growth in appliance ownership, and show the differences in 2025. Because the main effect of the options is to accelerate the transition to state-of-the-art appliances, the differences by 2025 are smaller than those in the intervening years. The emissions, energy and cost impacts are computed on an average basis over the period 2014-2025 and are presented in absolute terms and as a proportion of the levels associated with the baseline. It should be noted that due to unknown external factors, the absolute results have a high level of uncertainty, but the relative ranking of the options is not affected by this.

Table 3: % change in purchases of top-rated appliances in 2025 compared to baseline

Option	Western Europe		Central and Eastern Europe	
	2a	2b	2a	2b
Dishwashers	0.66%	0.66%	0.30%	0.30%
Fridges and freezers	1.79%	1.79%	0.05%	0.05%
Washing machines	0.02%	0.02%	0.00%	0.00%

Table 4 Average yearly impact 2014-2025

Option	0	2a	2b
average annual emissions (mT of CO ₂ /yr)	53.93	53.04 (98.35% of base)	53.62 (99.42% of base)
average annual energy use (TWh/yr)	125.42	123.35 (98.35% of base)	124.71 (99.43% of base)
average annual cost (billion €/yr)	21.32	20.97 (98.35% of base)	21.21 (99.48% of base)

Table 5: Evaluation of policy options in terms of their impacts

	option 0	option 2a	option 2b
<i>Effectiveness & efficiency</i>			
reduce energy consumption and CO2 emissions	0	++	+
promote energy efficiency hence contribute to security of supply	0	++	+
improve functioning of the Digital Single Market	0	+	+
increase the energy efficient share of sales of appliances online	0	++	+
promote consumers' energy efficiency awareness	0	++	+
facilitate the development of creative third party business models	0	+	+
<i>Coherence</i>			
impose no excessive administrative burden on merchants	0	0	0

7. MONITORING AND EVALUATION

A number of monitoring tools and indicators are recommended:

- The main monitoring tool should be sampling tests carried out to verify actual, correct and up-to-date online display of the information label and fiche in compliance with the Delegated Act. The monitoring should be done by market surveillance carried out by Member State authorities ensuring that requirements are met.
- The main indicator of progress on the market take-up of more energy efficient energy-related products should be the effective market shift towards the upper rating classes of the label, as measured by market surveillance. This should be accompanied by market surveys monitoring changes in purchase behaviour among the A, B, C and D channels as described in section 5.4, which can be used to measure the specific impact of the Delegated Act on the shift to the higher rating classes.
- Additional indicators should include changes in the administrative burdens of compliance and monitoring to assess longer term costs and benefits in relation to changes in energy consumption and market sales.

Taking into account the time necessary to collect, analyse and supplement data and experiences relating to the labelling scheme and to assess market progress, a review of the main elements of the Delegated Act could be presented within four years after its entry into force. It is relatively easy (and affordable) to monitor compliance with requirements to provide on-line information. As part of such a review, special attention should be paid to changes in the extent of compliance, consumer impact and further developments driven by commercial and public-interest forces.

ANNEX I: CONSULTATION

Minutes of the consultation meeting of 18 April 2012

Working document on the possibility of introducing horizontal requirements for online labelling

The Commission services presented the proposal for a horizontal measure regulating the online publishing of energy labels. The presentation of the main parts of the working document was well received. The innovation of inviting participants to log onto a demonstration site and explore the proposal in a real online environment was considered stimulating.

UK had no objections to the proposal, but preferred guidance to regulation. The UK is concerned that implementation would be taken away from Member States. They were given assurances that monitoring and compliance of online implementation would remain in the hands of the Member States.

DE supported ADCO guidance and asked whether a horizontal delegated act is legally possible.

Commission services: Articles 7 and 10 (4)(e) clearly state that a horizontal delegated act on this issue is possible. Provision has been made for implementing various aspects of the Labelling Directive (online included).

IT was the only country that expressed reservations about the idea. IT found it premature and not possible under the current Directive, and preferred to discuss it during the review of Directive 2010/30/EU. The Commission pointed out that the intervention was in fact late, as the original Directive required implementation online (Article 4(d) of the Directive 2010/30/EU) – which had been very largely lacking.

NL supported the proposal for legislation, as guidance is not the same as enforceable legislation, and it stressed the importance of consistent online labelling across the EU as a way to facilitate cross border eCommerce.

SE supported the proposal and wondered whether it is applicable to online advertising; it also enquired whether the possibility of using auction sites had been thoroughly examined as a likely sales channel for new appliances to be included in the draft delegated act. (i.e. a legal analysis has to be conducted).

Commission services: the advertising requirements of Directive 2010/30/EU cover online advertisement and promotional material, as the word 'any' is used in the text (Art 4 (c)-(d)). However, in this case it is only the energy efficiency class that has to be shown.

SE accepted the Commission's explanation that auction sites should be excluded for the time being.

CECED supported the proposal for a delegated act, and stated that manufacturers should be able to provide the label and the fiche electronically. However, it should be ensured that there is a single fiche and a single label, and that the issue of the transition period from the old label to the new label when an old piece of legislation is revised should be properly addressed.

INFORSE believes that this is a good initiative. The best web shops already have the information, but too many of them do not. Some countries and NGOs have sites which compare the energy efficiency of products, and this should be taken into consideration going forward. In particular, INFORSE would like to mention that a number of NGOs have organised “top-ten” websites, where the best products are listed. Links to such sites could be considered.

EMOTA (eCommerce association) saw no technical difficulties in the proposal, but asked that there should be a transition period for its implementation.

ANEC/BEUC strongly supported the proposal and looked forward to the approach being applied more widely.

The Commission services indicated that, in general, the Forum took a positive view of the proposal to draft a Delegated Act for implementing the online provisions of the EUP labelling directive. The Commission distributed a sheet of FAQ’s to the participants and invited them to submit their questions and send further comments on the working document to the Commission within one month.

Minutes of the consultation meeting of 10 July 2012

Welcome and presentation

The Chair welcomed the participants and recalled that the purpose of this meeting was to consult stakeholders, including Member States, on the development of a possible delegated act (DA) on online energy labelling.

This was followed by a Commission services presentation.

Scope

ANEC/BEUC noted that the inclusion of auction sites in the scope has strong consumer support.

DE referred to their written comment on the need to include auction sites in the DA. They also indicated that commercial sellers should be included but private sellers excluded when offering for sale second hand goods.

IT referred to their written comment stating that a DA would exceed the Commission's mandate. The proposal is de facto establishing a different type of label online. IT further stated that some manufacturers would not be in possession of electronic versions of energy

labels. For these reasons, this issue should be done through a revision of the Energy Labelling Directive ('the Directive') and not through a DA.

DK supported DE's comment on the need to include auction sites in the DA. They further asked the Commission services to explain legal base for the DA, in particular for the provisions covering online advertisement.

BE supported IT and questioned the appropriateness of using a DA since Article 10 of the Directive on delegated acts refers to 'product'. BE suggested a limited revision of the Directive at the appropriate timing regarding provision for horizontal requirements related to categories of products.

UK objected to a DA on this topic and considered guidance more appropriate than regulation. They inquired about the status of price comparison sites.

DE requested further explanation on using Article 7 of the Directive as the legal basis for the DA.

The Commission services responded to the legal questions related to the proposal. Consultation with the Legal Service of the Commission had confirmed that the Commission may adopt a DA on online energy labelling under the joint provisions Art 7 and Art 10.4e of 2010/30/EU.

The Commission services responded on the comments relating to "Price comparison sites" indicating that where no purchase could be made and therefore no commercial activity takes place they would be excluded. Where purchasing is possible they would be covered.

Regarding the printing of labels and the absence of electronic labels in some cases, raised by IT, the Commission services replied that where information is provided to a printer it is in electronic form on a computer and can be used online as any other electronic format.

Auction sites would be included since new goods must be covered according to the provisions of the Directive.

The Chair concluded that with regard to the legal issues raised the Commission services continue to consider that a horizontal DA is possible, but will further look at the issues raised, including through a check of the different language versions of the Directive. The Chair added that there seems to be broad consensus that auction sites would be included in the scope of a DA, but their private sellers should not be included.

Responsibility of suppliers

ANEC/BEUC indicated that web accessibility should not just be for sight impaired but also for others with accessibility issues. If it would not be possible to include reference to accessibility in the articles then it should at least be referred to in the recitals.

The Commission services responded that recitals are normally not used to refer to elements that are not included in the articles.

DE welcomed the fact that advertisement requirements provisions would not be repeated in this DA. Further, the term "online" instead of "distance" should be used consistently throughout.

CECED supported DE on use of term "online" and looked forward to participating in discussions on web accessibility in other fora.

ANEC/BEUC asked why it is not possible to include online advertising in the DA.

The Commission Services responded that the online provisions are in Article 7 of the Directive whereas advertising is covered in Article 4. The references to delegated acts in Article 7 do not refer to Article 4 and therefore a DA on online labelling could not cover this aspect. However, Article 4 is referred to in Article 10 and (online) advertising provisions will continue to be covered in the individual product specific DA's.

CECED indicated that including a list of options in chapter 3(2) could lead to confusion.

The Commission services responded that it is clear that when a supplier uses one of the four options, it can be considered to have fulfilled the obligations. It was acknowledged that tighter drafting is required to make the connection between 3(1) and 3(2) clear.

DK commented that from a market surveillance perspective it would be good to make point 3(2)(a) mandatory and thus the only option.

The Commission services replied that deleting 3(2)(b), (c) and (d) is a possible option, but making (a) mandatory may be too technology specific and create future development problems.

IT requested clarification on whether other forms of distance selling such as through TV channels would be covered by the DA, and whether suppliers are obliged to provide label and fiche only to dealers or also to market surveillance authorities or even the public at large.

The European Newspaper Publishers Association welcomed the fact that requirements related to advertisement would not be included in this DA.

ANEC/BEUC raised the question whether Article 290 of the Treaty really excluded the possibility for DAs to go beyond the narrow interpretation of the Commission's legal services. Accessibility requirements would be a much appreciated addition to the DA.

The Commission Services responded that the DA covered only online, i.e. internet, selling and does not address other forms of distance selling. Chapter 3(2) suggests that the label and fiche should only be given to dealers, whereas 3(1) does not clearly specify this. Tighter drafting would be required to make this clear. Concerning the legal basis, the Commission services replied that they remain comfortable in their interpretation.

The Chair concluded that there seems to be broad consensus that the elements related to online advertisement, online technical promotional material and web accessibility would not be included in the DA. No commitment could be made with regard to referring to web

accessibility in the recitals. Any reference to "distance selling" in the DA should be changed consistently to "online selling". The wording of and link between chapters 3(1) and 3(2) would need to be clarified.

Responsibility of dealers

IT indicated that the use of different terms such as "full label", "energy efficiency label" and "energy label" is not clear. Further, the "energy class image" is a new type of energy label and not included in the delegated powers of the Directive.

Eurocommerce questioned the added value of the product fiche online and inquired whether electronic newsletters would be covered under the DA.

DE replied to the comment raised by Eurocommerce regarding the fiche by mentioning that many product measures ask for product information to be made available on the web. It would be good to have the fiche on the web, but it should be consistent with the product measures.

ANEC/BEUC replied to IT and referred to previous discussions held in the context of directional lights and LEDs where there were no objections to a proposal to have reduced labels for some lamps.

The Commission services responded that the legal issue raised by IT had already been discussed earlier in the discussion on the scope.

CY agreed with remarks from IT and raised the question of what colour the arrow would be.

CECED supported the display of the fiche online, but indicated that the product fiche cannot have a font size comparable to that of the price. Further, 4(1) should be drafted more clearly.

INFORSE argued that the fiche should be directly available.

The Commission services indicated that newsletters could be treated like price comparison sites as they do normally not lead to checkout and payment. Further, with regard to the colour of the arrow for the energy class image, it would be logical to apply the appropriate colour from the energy efficiency class of the label although colour codes in the online environment differ from printing colour codes.

IT stated that only the energy efficiency class should be indicated and not an arrow. The fiche should be displayed but with a different font. If a specific colour would have to be displayed, this would be problematic for market surveillance.

NL indicated that if colours online are problematic this would also be a problem for the full label which also uses colours. In principle however, colour reinforces the message. Showing the full label would not be practical. The energy class image arrow does not seem a new type of label and a minimum specification is needed, because the less one specifies the more website designers and dealers feel tempted to add elements themselves. The term "full energy label" should be avoided.

DE indicated that on the layout the annex needs to be more precise: colours should be specified. The current colours in product legislation are for printing media and online different specifications are needed. Both the term "mouse roll-over" and "mouse click" should be referred to in Chapter 4 and in the Annex. They further raised the issue of ensuring compliance of websites outside the EU.

UK stated that a shorthand reference to the label is needed and would support use of colour in the energy class arrow rather than a standardised black arrow.

The Chair concluded that there was support for the fiche being made available. Regarding the debate about colour the Commission will continue to look at this. He welcomed feedback on whether the energy class identifier should be black or in colour and added that the Commission would engage in further legal analysis on the issue in general. The annex would need to state what colours should be used, at least for the energy label. There would need to be consistency on "mouse roll-over" and "mouse click" and views are welcome what the preferred term (one of the two or both) should be.

Market Surveillance

The Commission services confirmed that this section should be deleted in the possible DA.

IT questioned whether it would really be possible to do market surveillance online.

Eurocommerce mentioned the practice of retailers being approached by private companies who threaten to sue on non-compliance issues and who charge consultancy fees for assisting to correct non-compliances and requested that it is clarified that Member States authorities are responsible for this.

ANEC/BEUC reacted to the issue raised by Eurocommerce by saying that certain consumer organisations are empowered to sue companies that do not comply with the relevant legislation.

BE referred to the comment by IT and asked what is expected of Member States regarding market surveillance on online labelling.

The Commission services indicated that market surveillance is the responsibility of Member States, but that there is clearly room for coordination through the ADCO (Administrative Cooperation) meetings and possibly through joint actions similar to those of DG SANCO in the area of e.g. safety of toys and other products. On the market surveillance of online labelling it may be possible to automate this which could be demonstrated in a future ADCO meeting.

Transitional provisions and review

DE indicated that a six month timeframe is too tight and 12 months might be more realistic.

NL commented that specific transitional provisions are not necessary as this aspect is already dealt with in chapter 8 that deals with entry into force provisions.

DK stated that a review after five years is too far in time and proposed a review after four years. Further, they suggested that the review specifically address effectiveness and consumer understanding.

EMOTA mentioned that 12 months for the entry into force is more realistic than six since websites can be dealing with more than 10 000 products, but yet not have many staff.

IT raised the question whether this DA would oblige all suppliers to provide information electronically, including even those who did not envisage their products being sold online.

ANEC/BEUC mentioned they believe two weeks should be sufficient for entry into force, but could agree to a six month period.

The Commission services responded positively on the DK suggestion of what the review should address and welcomed further comments and arguments on the review and entry into force timeframes. The issue raised by IT would also require further consideration.

Annex

NL indicated that the title of the annex may need changing as 'magnification' is not specifically addressed in the annex.

IT was of the view that all arrows should be deleted from the Annex.

Summary

The Chair summed up all conclusions from the separate chapters discussed and invited written contributions on the proposed DA by 10 September 2012.

ANNEX II: REFERENCES IN DELEGATED ACTS TO DISTANCE SELLING AND EXAMPLES OF DISPLAY ON THE INTERNET

At present, the delegated acts covering certain specific products make explicit provision for the display of information in the online environment and other ‘distance selling’ arrangements where end-users cannot be expected to see the product before purchase. These provisions were made in two tranches: explicit references for Air conditioners (2002/31/EC), Ovens (2002/40/EC) and Refrigerators (2003/66/EC) before the recast Directive and provisions for Dishwashers (1059/2010/EC), Refrigerators (1060/2010/EC), Washing machines (1061/2010/EC) and Televisions (1061/2010/EC) afterwards. These mainly covered the provision of information specified for the label, but differed as to additional information and indications of how information should be displayed. The following Table summarises the provisions; the applicable texts follow.

Table 6: References to online labelling in Ecolabelling Directive Delegated Acts

Instrument	Product	Information	Display
<i>2002/31/EC</i>	air conditioners	full fiche information	No
<i>2002/41/EC</i>	ovens	more than label, subset of fiche, optional additional (fiche) information must be in the same order as fiche	No
<i>2003/66/EC</i>	Refrigerators	“information as in Annex III” but Annex III deleted	No
<i>1059/2010</i>	Dishwashers	More than label (order altered), less than fiche, optional fiche information in same order as fiche	“visible” size and font
<i>1060/2010/EC</i>	Refrigerators	more than label, less than fiche), optional fiche information in same order as fiche	“visible” size and font
<i>1061/2010/EC</i>	Washing machines	more than label, less than fiche), optional fiche information in same order as fiche	“visible” size and font
<i>1062/2010/EC</i>	televisions	(as on label), optional fiche information in same order as fiche	“visible” size and font
<i>Draft</i>	Tumble driers	more than label, less than fiche), optional fiche information in same order as fiche	“visible” size and font

Text extracts

“The information may be given in the form of a table covering a number of models supplied by the same supplier, in which case it shall be given in the order specified, or given close to the description of the appliance:

- Supplier's trade mark.
- Supplier's model identifier.
- For ‘split and multi-split units’, the model identifier of the indoor and of the outdoor elements of the combination to which the figures quoted below apply.

- The energy efficiency class of the model, determined in accordance with Annex IV. Expressed as ‘Energy efficiency class on a scale of A (more efficient) to G (less efficient)’. Where this information is provided in a table, this may be expressed by other means provided it is clear that the scale is from A (more efficient) to G (less efficient).
- Where the information is provided in a table, and where some of the appliances listed in the table have been granted a ‘European Union ecolabel’ under Regulation (EC) No 1980/2000, this information may be included here. In this case the row heading shall state ‘European Union eco-label’ and the entry shall consist of a copy of the eco-label. This provision is without prejudice to any requirements under the Community eco-label award scheme.
- The indicative annual consumption of energy based on an average use of 500 h per year, determined in accordance with the test procedures of the harmonised standards referred to in Article 2 (conditions T1 ‘moderate’), as defined in Annex I, note V.
- The cooling output defined as the cooling capacity in kW of the appliance in cooling mode at full load, determined in accordance with the test procedures of the harmonised standards referred to in Article 2 (conditions T1 ‘moderate’), as defined in Annex I, note VI.
- The EER (energy efficiency ratio) of the appliance in cooling mode at full load, determined in accordance with the test procedures of the harmonised standards referred to in Article 2 (conditions T1 ‘moderate’).
- The type of appliance: cooling only, cooling/heating.
- The cooling mode: air cooled, water cooled.
- Only for appliances with heating capability the heat output defined as heating capacity in kW of the appliance in heating mode at full load, determined in accordance with the test procedures of the harmonised standards referred to in Article 2 (conditions T1 + 7C), as defined in Annex I, note X.
- Only for appliances with heating capability the heating mode energy efficiency class in accordance with Annex IV, expressed on a scale of A (higher) to G (lower), determined in accordance with the test procedures of the harmonised standards referred to in Article 2 (conditions T1 + 7C), as defined in Annex I, note XI. If the appliance heating capability is provided by a resistive element then the COP (coefficient of performance) shall have the value of 1.
- Where applicable, noise during standard function, determined in accordance with Directive 86/594/EEC.
- Suppliers may include in addition the information in points 5 to 8 in respect of other test conditions determined in accordance with the test procedures of the harmonised standards referred to in Article 2.

If a copy of the label, either in colour or black and white is included in the fiche, then only the further information needs to be added.

NB: The equivalent terms in other languages to those given above are set out in Annex V.”

Ovens (2002/40/EC):

“Mail order catalogues, communications, written offers, advertisements on the Internet or on other electronic media referred to in Article 3(4), including offers for built-in ovens for integrated kitchens, shall contain the following information, given in the order specified:

- Supplier's trade mark and model identifier (Annex II, points 1 and 2)
- Energy efficiency class (Annex II, point 3)
- Energy consumption (Annex II, point 5)
- Usable volume (Annex II, point 6)
- Size (Annex II, point 7)
- Noise (Annex II, point 9).

Where other information contained in the fiche is provided, it shall be in the form defined in Annex II and shall be included in the above table in the order required for the fiche.

NB: The equivalent terms in other languages to those given above are set out in Annex V.”

Dishwashers (1059/2010):

“Information to be provided in the cases where end-users cannot be expected to see the product displayed

The information referred to in Article 4(b) shall be provided in the following order:

- The energy efficiency class, as defined in point 1 of Annex VI;
- The rated capacity in standard place settings for the standard cleaning cycle;
- The annual energy consumption (AE C) in kWh per year, rounded up to the nearest integer and calculated in accordance with point 1(b) of Annex VII;
- The annual water consumption (AW C) in litres per year, rounded up to the nearest integer and calculated in accordance with point 3 of Annex VII;
- The drying efficiency class in accordance with point 2 of Annex VI;
- Airborne acoustical noise emissions in dB(A) re 1 pW and rounded to the nearest integer;
- If the model is intended to be built-in, an indication to this effect.

Where other information contained in the product fiche is also provided, it shall be in the form and order specified in Annex II.

The size and font in which all the information referred in this Annex is printed or shown shall be legible.”

Refrigerators (1060/2010):

“Information to be provided in the cases where end-users cannot be expected to see the product displayed

The information referred to in Article 4(b) shall be provided in the following order:

- The energy efficiency class of the model as defined in Annex IX;
- The annual energy consumption in kWh per year, rounded up to the nearest integer and calculated in accordance with point 3(2) of Annex VIII;
- The storage volume of each compartment and applicable star rating in accordance with point 1(1)VI of Annex II, if any;
- The ‘climate class’ in accordance with point 1, Table 3 of Annex VIII;
- Airborne acoustical noise emissions expressed in dB(A) re1 pW, rounded to the nearest integer;
- If the model is intended to be built-in, an indication to this effect;
- For wine storage appliances the following information: ‘This appliance is intended to be used exclusively for the storage of wine’. This point shall not apply to household refrigerating appliances that are not specifically designed for wine storage but may nevertheless be used for this purpose, or to household refrigerating appliances that have a wine storage compartment combined with any other compartment type.

Where other information contained in the product fiche is also provided, it shall be in the form and order specified in Annex III.

The size and font in which all the information referred in this Annex is printed or shown shall be legible.”

Washers (1061/2010)

“Information to be provided in the cases where end-users cannot be expected to see the product displayed

The information referred to in Article 4(b) shall be provided in the following order:

- The rated capacity in kg of cotton, for the standard 60 °C cotton programme at full load or the standard 40 °C cotton programme at full load, whichever is the lower;
- The energy efficiency class as defined in point 1 of Annex VI;
- The weighted annual energy consumption in kWh per year, rounded up to the nearest integer and calculated in accordance with point 1(c) of Annex VII;

- The weighted annual water consumption in litres per year, rounded up to the nearest integer and calculated in accordance with point 2(a) of Annex VII;
- The spin-drying efficiency class in accordance with point 2 of Annex VI;
- The maximum spin speed attained for the standard 60 °C cotton programme at full load or the standard 40 °C cotton programme at partial load, whichever is the lower, and the remaining moisture content attained for the standard 60 °C cotton programme at full load or the standard 40 °C cotton programme at partial load, whichever is the greater;
- Airborne acoustical noise emissions during the washing and spinning phases, for the standard 60 °C cotton programme at full load, expressed in dB(A) re 1 pW and rounded to the nearest integer;
- If the household washing machine is produced in order to be built-in, an indication to this effect.

Where other information contained in the product fiche is also provided, it shall be in the form and order specified in Annex II.

The size and font, in which all the information referred in this Annex is printed or shown, shall be legible.”

Televisions (1062/2010):

“Information to be provided in the cases where end-users cannot be expected to see the product displayed

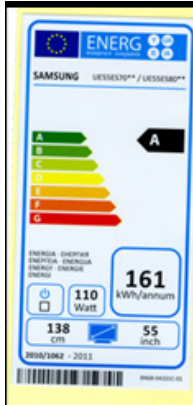
The information referred to in Article 4(b) shall be provided in the following order:

- The energy efficiency class of the model as defined in Annex I;
- The on-mode power consumption as referred to in point 1 of Annex II;
- The annual power consumption in accordance with point 2 of Annex II;
- The visible screen diagonal.

Where other information contained in the product information fiche is also provided, it shall be in the form and order specified in Annex III.

The size and font in which all the information referred in this Annex is printed or shown shall be legible.”

Examples of display on the internet



Product fiche


		Samsung			
		UE46E570**	UE46E570**	UE55U70**	UE46E580**
1	Model Name	UE46E570**	UE46E570**	UE55U70**	UE46E580**
2	Energy Efficiency Class	B	A	A	B
3	Screen Size (cm)	102	110	138	102
4	Screen Size (inches)	40	43	55	40
5	On mode power Consumption (W)	88.0	81.4	110	88.0
6	Annual Energy Consumption* (kWh)	128	118	161	128
7	Standby mode Power Consumption (W)	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49
8	Off mode Power Consumption (W)	N/A	N/A	N/A	N/A
9	Screen Resolution	1920*1080	1920*1080	1920*1080	1920*1080

		Samsung		
		UE46E580**	UE55U80**	UE46E580**
1	Model Name	UE46E580**	UE55U80**	UE46E580**
2	Energy Efficiency Class	A	A	A
3	Screen Size (cm)	110	138	102
4	Screen Size (inches)	43	55	40
5	On mode power Consumption (W)	81.4	110	78.0
6	Annual Energy Consumption* (kWh)	118	161	128
7	Standby mode Power Consumption (W)	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49	Default setting: 0.10 2007 "Stand-by mode" (Julia) standby mode (W): 0.49
8	Off mode Power Consumption (W)	N/A	N/A	N/A
9	Screen Resolution	1920*1080	1920*1080	1920*1080

* Energy consumption kWh per year, based on the power consumption of the television operating 4 hours per day for 365 days. The actual energy consumption will depend on how the television is used.



UE46E56300 3D LED Smart TV



HD TV 1080p, 46 inch (116 cm) 16/9, 200Hz, Freeview, 3D Ready, Ethernet, HDMI x3, Time Shift, USB 2.0 x3, Integrated WiFi

Enjoy smooth displays and high-resolution 1080p images thanks to 200 HZ technology on the UE46E56300 3D LED Television from Samsung. The 3D Hyper Real Engine and Wide Colour Enhancer Plus combine to...

Rating: ★★★★★ [3 Reviews](#)


~~€ 1,199~~

€ 819

Inc. VAT

IN STOCK

UE40E56100 - LED 3D Smart TV Television



HD TV 1080p, 40 inch (101 cm) 16/9, 200Hz, Freeview, 3D Ready, Ethernet, HDMI x3, USB 2.0 x3, Integrated WiFi

The Samsung UE40E56100 LED television benefits from an ultrathin frame to immerse the viewer in the heart of the image. WiFi and 3D ready, the UE40E56100 screen plunges viewers into a world of High...

Rating: ★★★★★ [3 Reviews](#)


~~€ 699~~

€ 609

Inc. VAT

IN STOCK

UE32E56300 3D LED Smart TV



HD TV 1080p, 32 inch (82 cm) 16/9, 200Hz, Freeview, 3D Ready, Ethernet, HDMI x3, Time Shift, USB 2.0 x3, Integrated WiFi

Enjoy smooth displays and high-resolution 1080p images thanks to 200 HZ technology on the UE32E56300 3D LED Television from Samsung. The 3D Hyper Real Engine and Wide Colour Enhancer Plus combine to...

~~€ 699~~

€ 519

Inc. VAT

IN STOCK

ANNEX III: EXTERNAL EXPERTISE: SELECTION OF PRODUCTS FOR THE BASELINE

Selection of products

The four appliances selected for inclusion in the Impact Assessment were selected on the basis of specific relevance indicators and availability of suitable data as follows:

- End-consumer influence over product choice – some products are purchased on behalf of consumers by intermediaries, e.g. building contractors, who are likely to be exposed to energy information from other sources;
- Information on the efficiency rating distribution of purchases – this is necessary to calibrate the model used to project energy and emissions impacts, which are presumed (see below) to be a consequence of the mix of efficiency levels in the stock in use;
- Information on the proportion of purchase decisions made on-line – these are rarely observed directly at individual product level, but can be inferred from data on on-line purchases of product classes (see Annex III);
- Time-series information on the stock of appliances – this is used to differentiate the impacts associated with replacement from those reflecting new purchases (net additions to the product stock) and thus to create scenarios reflecting different macroeconomic conditions; and
- Availability of sufficient time-series data reflecting purchase behaviour under a product-specific Delegated Act – many of the energy using products covered under the recrafted Directive have not yet accumulated sufficient time under the off-line labelling provisions of the Directive to allow the model to determine the incremental effect of the online labelling provisions.

The following summaries are primarily based on the ecodesign and energy labelling preparatory studies, but also reflect other sources listed in the Bibliography. The impact of various appliances can be seen in Figure 12.

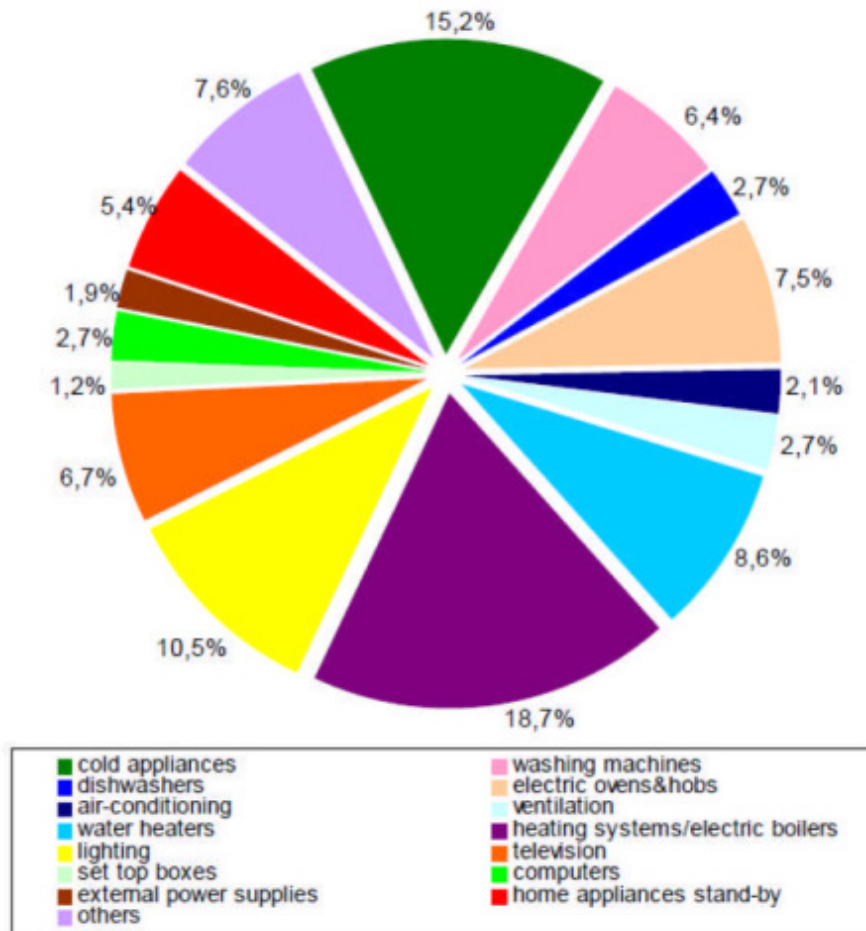


Figure 12: 2007 sources of EWU-276 residential energy consumption³⁴

The evolution over time of relevant components of residential energy consumption (Figure 13) shows strong growth in the stock of energy-related products, partially – but not wholly – offset by improvements in energy efficiency and patterns of use. It also shows that stocks and total household energy consumption by appliances have continued to grow during the post-2007 recession. Interestingly, the growth of total energy consumption has moderated during this period, suggesting that the recession (and increasing energy prices) have affected the intensity with which appliances are used. Note also that the specific energy use associated with one of the unmodelled appliances (excluded for lack of sufficient data) has continued to climb, indicating that the impacts projected here understate the true impacts.

³⁴ Bertholdi, P. and B. Atanasiu (2009) "Electricity consumption and efficiency trends in the European Union" DG JRC

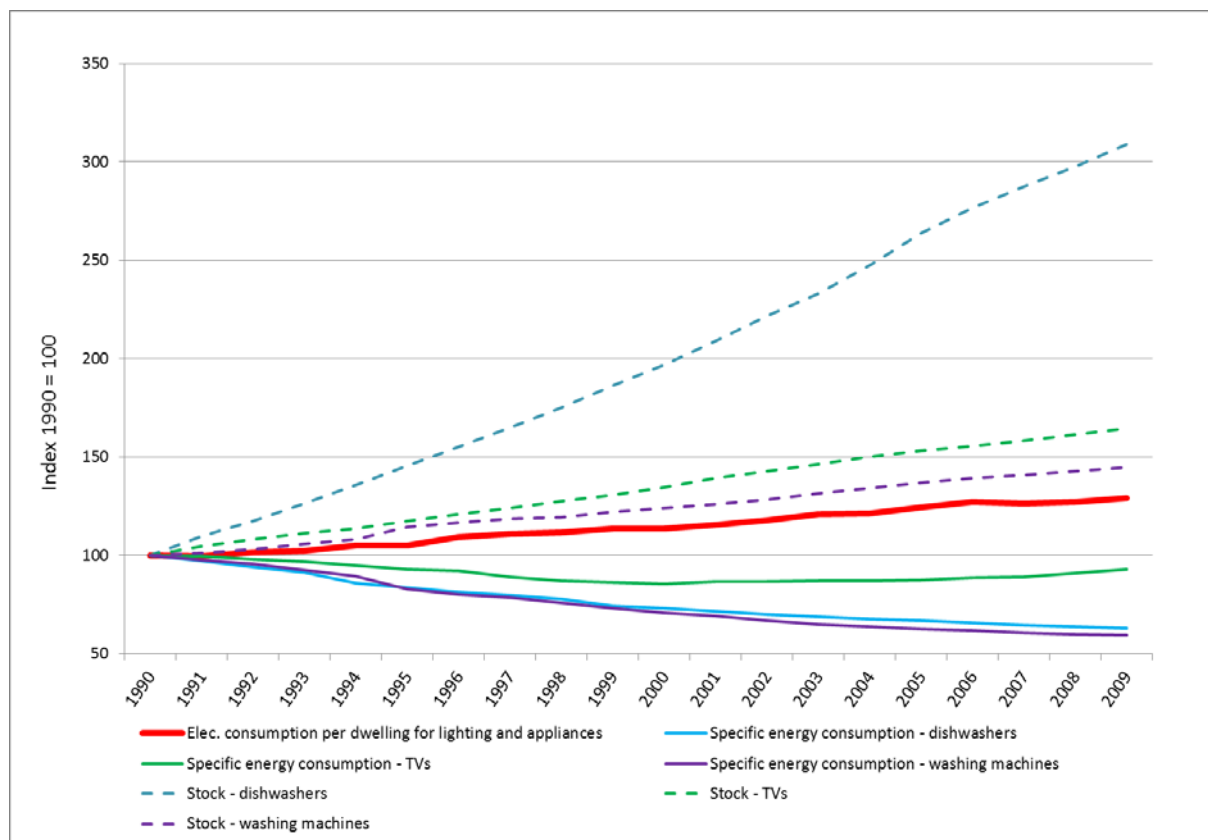


Figure 13: Evolution of energy consumption and use - EU27

Source: European Environment Agency – data from <http://services.enerdata.net>, ODYSSEE database.

Table 7 provides a summary of the factors leading to choice of products to include in the baseline and impact computations.

Table 7: Availability of data and impact indications for different product classes

Product	Basis for Reason for inclusion/exclusion in quantitative assessment	Data		Relevance			
		Efficiency	Online purchase	Sufficient time under Delegated act	Importance of energy to consumer choice	Impact of labelling on purchases?	End-user influence on purchase
<i>Boilers and combiboilers</i>	Little end-user influence on purchases and lack of relevant data	Indirect (type, capacity)	No	No	Significant	Insufficient data	Labels allow developers to 'sell' better boilers ³⁵ .
<i>Commercial refrigerators and freezers</i>	Insufficient data	N/A	N/A	No	Significant	Insufficient data	Yes
<i>Complex set-top boxes</i>	Little consumer influence	No	No	No	Minimal	Insufficient data	Yes

³⁵ 2004 UK survey showed that awareness of labels (not content) was correlated with purchase of efficient devices.

Product	Basis for Reason for inclusion/exclusion in quantitative assessment	Data		Relevance			
		Efficiency	Online purchase	Sufficient time under Delegated act	Importance of energy to consumer choice	Impact of labelling on purchases?	End-user influence on purchase
<i>Computers and monitors</i>	Little evidence of label impact on choice. Competing voluntary, private labels.	Only by type ³⁶	Indirect	No	Potential	Only voluntary labels; no comparative studies	Limited ³⁷
<i>Consumer electronics: TV</i>	Complexity of screen sizes, multiple TVs per household, etc.	Limited ³⁸	Partial	Yes	Minimal	Insufficient data	Limited
<i>Dishwashers</i>	Meets criteria	Yes ³⁹	Approximate	Yes	Unknown	Yes	Yes
<i>Domestic Lighting</i>	Insufficient data	Indirect	Indirect	No	Significant	Insufficient data	Yes
<i>Domestic refrigerators and freezers</i>	Meets criteria	Yes	Approximate	Yes	Significant	Yes	High energy efficiency
<i>Domestic washing machines</i>	Meets criteria	Yes	Approximate	Yes	Significant	Yes	Yes
<i>Electric motors</i>	Insufficient data	Indirect	No	No	Unknown	Insufficient data	Potential
<i>External power supplies and battery chargers</i>	Insufficient data, indirect evidence of current low impact	Generally purchased in conjunction with appliances	No	No	Minimal	N/A	Generally tied to equipment for which used.
<i>Hobs</i>	Insufficient data	Indirect	Indirect	No	Unknown	Insufficient data	Potential
<i>Imaging equipment (fax, scanner, etc.)</i>	Insufficient data	No	No	No	Potential, not encouraging ⁴⁰	Insufficient data	Yes
<i>Laundry dryers</i>	Label has not been highly effective to date	Yes (GfK)	Approximate	No	Energy is important, but little variance during survey period	Internet sources important according to survey.	Yes

³⁶ Energy utilisation driven by technology (below aggregation of available data) and usage patterns more than product choice.

³⁷ 2005 Fraunhofer report (DE only; focus on stand-by power information): studies show little awareness of label meaning, variety of voluntary labels; US mandates online; efficiency changes driven by technological progress e.g. speed/size/monitor type) rather than energy considerations *per se*.

³⁸ Not by class, some data on CRT vs. flat-panel (not e.g. plasma/LCD etc.) and screen size.

³⁹ Class data uses current A-G and shows near-saturation at A level so little variance to model.

⁴⁰ Preparatory Study cites supplier and customer survey evidence; Business users rated environmental characteristics (including eco-labels) highly on survey, but ranked them below functions and price. Purchases made by organised/large-scale procurement; online availability may be secondary. Public procurement inclusion of environmental criteria varies widely by country – more relevant to labelling than online labelling. Private users paid little attention to energy, etc.

Product	Basis for Reason for inclusion/exclusion in quantitative assessment	Data		Relevance			
		Efficiency	Online purchase	Sufficient time under Delegated act	Importance of energy to consumer choice	Impact of labelling on purchases?	End-user influence on purchase
<i>Office lighting</i>	Main aspects of label information already covered in standard description	By type, wattage, etc.	No	No	Potential	Insufficient data	Different 'consumer' associated classes with fixture, lamp replacement; energy use matters
<i>Ovens</i>	Insufficient data	Indirect	Indirect	Yes	Significant	Insufficient data	Potential
<i>Room air conditioning</i>	Insufficient data	Yes (GfK and Eurovent)	No	Yes	Potential	Insufficient data	Complex picture; rentals, delegation to installers, difficulty of forecasting need (tendency to overcapacity)
<i>Simple set-top boxes</i>	Insufficient data	No	No	No	Minimal	Insufficient data	Yes
<i>Sound and imaging equipment</i>	Insufficient data	No	No	No	Minimal	Insufficient data	Yes
<i>Standby and off-mode losses</i>	Not directly related to online information provision	N/A	N/A	No	N/A	N/A	Unknown
<i>Street lighting</i>	Unlikely to be purchased/chosen online; bought via procurement	By type	No	No	Significant	Formal procurement: mandated online label unnecessary	Procurement officers
<i>Transformers</i>	Insufficient data	Insufficient data	Indirect	No	Minimal	Insufficient data	Potential
<i>Vacuum cleaner</i>	Insufficient data	Insufficient data	Insufficient data	No	N/A	Insufficient data	Insufficient data
<i>Water heaters</i>	Little end-user influence, lack of relevant data	Indirect (type/capacity)	No	No	Potential	Insufficient data	Increasing tendency to let installer choose.

Factors affecting baseline impact and significance of unmodelled products

The selection depends in part on the availability of suitable evidence and analysis covering the process by which the Delegated Act should operate. In this document, the potentially quantifiable impacts of policy options covering the online provision of Directive-mandated information derive from a simplified causal chain.

1. Demographic, economic and technological factors determine

- (a) Overall demand for energy-related products
 - (b) The mix of online and offline channels used by customers and
 - (c) The correlation between channel use and
 - (1) sensitivity to environmental considerations (e.g. in contrast to price, features, etc.); and
 - (2) influence of labels and other forms of information;
1. The combination of availability, pricing, features and e.g. energy costs determines the allocation of demand across different classes of appliance;
 2. The flow of new appliances influences the overall stock of appliances;
 3. The stock of appliances and patterns of use determine the overall consumption of energy and other impacts.

This causal chain presents a greatly simplified view of the hybrid and dynamic on- and offline market environment. To some extent, this simplification is necessary, but an understanding of its limitations is necessary both to qualify the results and to inform evaluation and monitoring strategy that can fill in some of the gaps. This approach:

1. Neglects feedback from demand to innovation and production;
2. Discounts trade-offs between labelling and pricing⁴¹;
3. Does not take into account differences between appliances sold online and off- line (or the way they are used); and
4. Does not quantify the extent to which online provision of information allows consumers to compare more products (sharpening competition and innovation incentives).

The approach taken for the quantitative impact assessment does not address the question of whether online information might be more effective (compared to offline information) in catalysing individual or collective shifts towards more energy efficient patterns of use.

The central focus in this section is not the impact of labelling per se on purchase decisions or consequence for product design and availability. These are important topics, and it is certainly reasonable to assume that online labelling will contribute to these objectives; indeed, we discuss below evidence as to why it might be expected to outperform offline labelling in this regard. However, these arguments are difficult to quantify on existing evidence.

⁴¹ Suppliers or dealers can capture energy savings from high-performing appliances in purchase price. Studies have shown that purchase price and operating costs are not perfect substitutes even when the latter can be perfectly predicted from the information provided; this allows rent-seeking. Moreover, if environmental performance is valued in its own right (as a merit good) or as a hedonic attribute (e.g. a status good), consumer willingness-to-pay no longer corresponds to energy savings. Conversely, compulsory information provision may remove a distinguishing characteristic of those suppliers and dealers who voluntarily provide such information, reducing rents, sharpening competition along other dimensions or 'crowding out' innovative information.

To quantify the resulting impact on environmental outcomes, it is also necessary to consider whether e.g. energy utilisation reflects choice of products more than usage patterns. In the latter case (e.g. as regards standby mode vs. hard-off switching) labelling exercises a secondary, awareness-raising influence, but this has proven difficult to quantify.

Therefore the baseline depends on the following factors:

- Impacts attributed to the labelling provisions associated with the existing Directive for specific product classes;
- The extent to which purchases within those classes are decided online;
- The degree to which those making purchasing decisions are (differentially) affected by environmental considerations and/or are affected by labelling information; and
- The extent to which energy savings will result from improved purchasing patterns.

Contextual factors affecting the impacts of online labels

There have been relatively few rigorous studies of the extent to which labels directly affect consumer purchasing behaviour and the consequent impact on energy utilisation⁴². The reasons are simple, but important – labelling in general and mandatory labelling in particular are affected by:

- Technological advances, pricing, income and other determinants of demand and supply behaviour;
- Other regulations (notably the Ecodesign Directive); and
- Other labelling initiatives.⁴³

The Preparatory Studies⁴⁴ summarise the features of these confounding factors in more detail than is appropriate here. We briefly note the most relevant factors.

Technological advances may reduce the impact of labelling on purchases of more efficient products by reducing the variance of labelled performance⁴⁵ or by making available optional features whose attractiveness outweighs differences in ecological performance⁴⁶. In some cases (e.g. the switch from CRT to LCD computer monitors and televisions) technology may include environmental improvement as a side-effect – consumers may switch to a more efficient screen simply because it performs better or has other attractive features. Similarly,

⁴² Such studies could be carried out using a combination of stated-preference (experimental) and revealed-preference (empirical) methods, but to date there is only scattered survey evidence.

⁴³ These range from voluntary eco-labels to compulsory labels applying to specific products and countries.

⁴⁴ See <http://env-ngo.eup-network.de/product-groups/preparatory-studies/> for completed and on-going studies.

⁴⁵ This is especially problematic for products whose headline classification and/or rating has not kept pace with technological improvements.

⁴⁶ One example is the movement towards larger televisions, which currently outpaces the increased energy efficiency per unit of screen area.

shifting purchase and/or energy prices may alter the importance attached by consumers to ecological performance. On the other hand, technological progress may enhance the salience to consumers of both labels and the information they provide e.g. for choosing among products differing primarily in eco-performance; similarly, sharply increased energy prices combined with pressures on disposable income may make energy efficiency more important.

The combined impact of the Ecodesign Directive and the ELD is reflected in the holistic nature of most of the Preparatory Studies. This is particularly relevant for product classes for which considerations of affordability, heterogeneous consumer preferences for functionality and other product characteristics and competition considerations ensure that efficient market outcomes imply the persistence of products with differing eco-performance. For such products, setting minimum standards on the grounds of Best Available Technology using the Ecodesign Directive as a ‘floor’ may be insufficient and require supplementary support for informed consumer choice via the ELD. The ELD Impact Assessment⁴⁷ draws attention to technical savings potentials associated with more efficient products identified in the Preparatory Studies and amounting to some 65-75 TWh/year, of which labelling is thought to be capable of providing 35 TWh⁴⁸. It should be noted, however, that this estimate of the effectiveness of labelling is based primarily on aggregate time-series approaches rather than studies of the direct effect of labels on particular purchasers. For the main product groups considered in the Impact Assessment for the ELD this indirect approach to measuring the impacts of labels can be seen in the presentation of the labelling impacts as a residual savings. In that study, the impacts were primarily expected from products for which labels were new or considerably extended. The headline impacts were expected energy savings calibrated as energy usage (TWh) and primary energy (mtoe), emissions (MTCO₂); and associated energy cost savings:

Table 8: estimated labelling impacts for unmodelled products

Product	Savings	TWh	mtoe	MTCO ₂	€billion
Televisions	Total	46			
	Labelling	12	1	4.8	1.66
Lighting	Total	74			
	Labelling	16	1.5	6.4	2.2
Heating and hot water	Total	-	58 (total ⁴⁹ by 2020)	90 (total by 2020)	45 (per yr)
	Labelling	-	18 (31% of total)	46 (51% of total)	15 ⁵⁰ (per yr; 33% of total)

This does not, of course, mean that the quantitative impacts are limited to those products; results from a 2009 IPSOS-MORI report on Green Technology show that (US) consumers incorporate environmental considerations in making a wide range of purchases.

⁴⁷ European Commission (2008) “Accompanying document to the Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products: IMPACT ASSESSMENT” Staff Working Document [COM(2008) 778 final {SEC(2008) 2863}.

⁴⁸ Equivalent to 3 MToE of primary energy using the conversion factors provided in the EU Energy and Transport in Figures, Statistical pocketbook, 2007/2008.

⁴⁹ This is the combined total arising from three Directives: the Ecodesign Directive, the Ecolabelling Directive and the Energy Performance of Buildings Directive

⁵⁰ In effect attributing one-third of the impact to one of the three Directives involved.

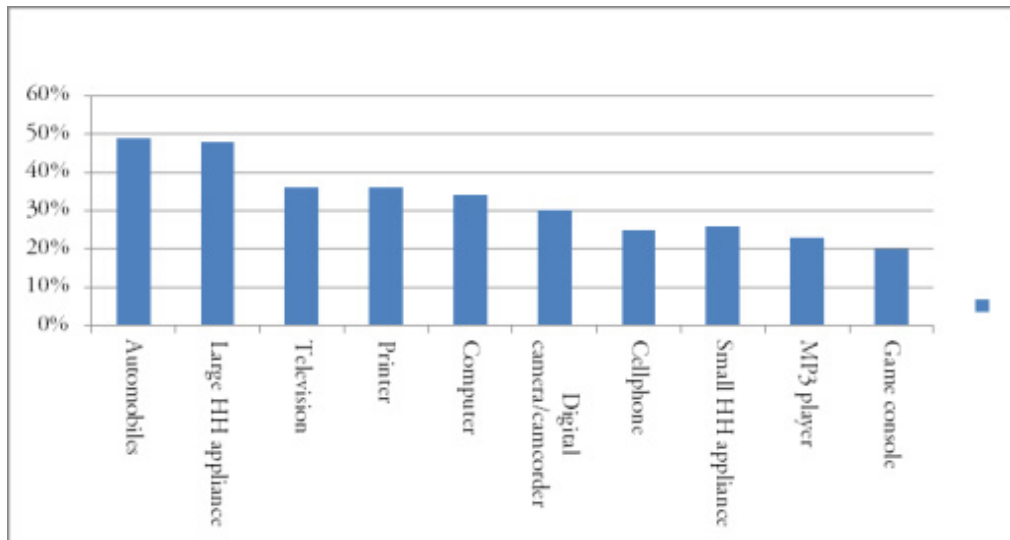


Figure 14: proportion of consumers considering environmental factors in making purchases

Although comparable data are not available for the EU, Figure 14 shows the distribution of importance attached by citizens of EU-27 Member States when making major appliance purchases (2009 data).

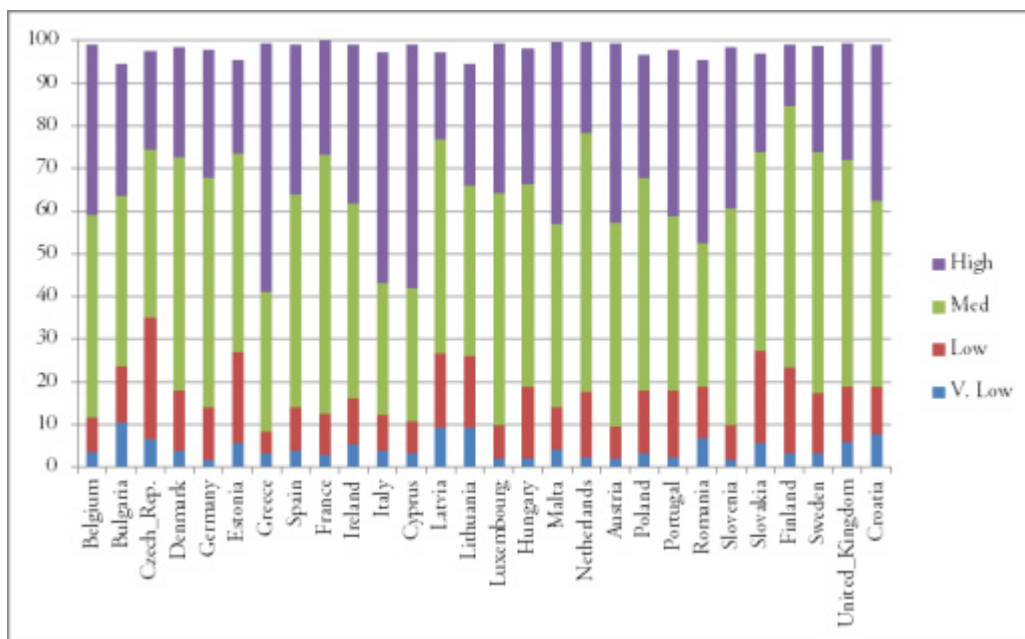


Figure 15: Importance of ecological considerations for major appliance purchases

Finally, there is strong evidence that both energy labels and Internet-derived information are important factors in major appliance purchases. A survey conducted in conjunction with the refrigerator, washing machine and dishwasher Preparatory Studies identified the following factors influencing such purchases:

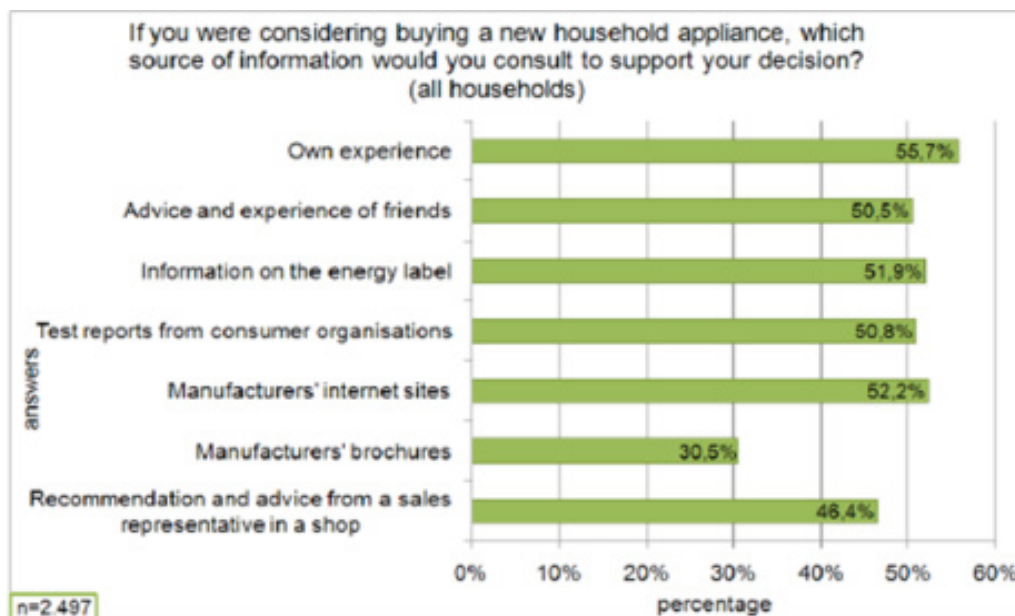


Figure 16: Sources of information for major appliance purchases (EU-27)

Baseline data

The following figures give some baseline data for the impact assessment. For each product shown, the baseline includes the impacts of existing labels and existing ecodesign requirements. No additional assumptions have been made about levels of compliance; the baseline has been obtained by adjusting the demand projections based on offline labels for the attenuating effects due to increased proportions of online search and purchase⁵¹ and the enhancement due to the information provision in the online environment.

Figure 17 shows baseline energy class evolution of washing machines (W), dishwashers (D) and refrigerators and freezers (R) in Western Europe and Eastern Europe.

	Western Europe	Central and Eastern Europe
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⁵¹ This is based on time series extrapolation of current trends as shown in **Figure 2** and **Figure 23**.

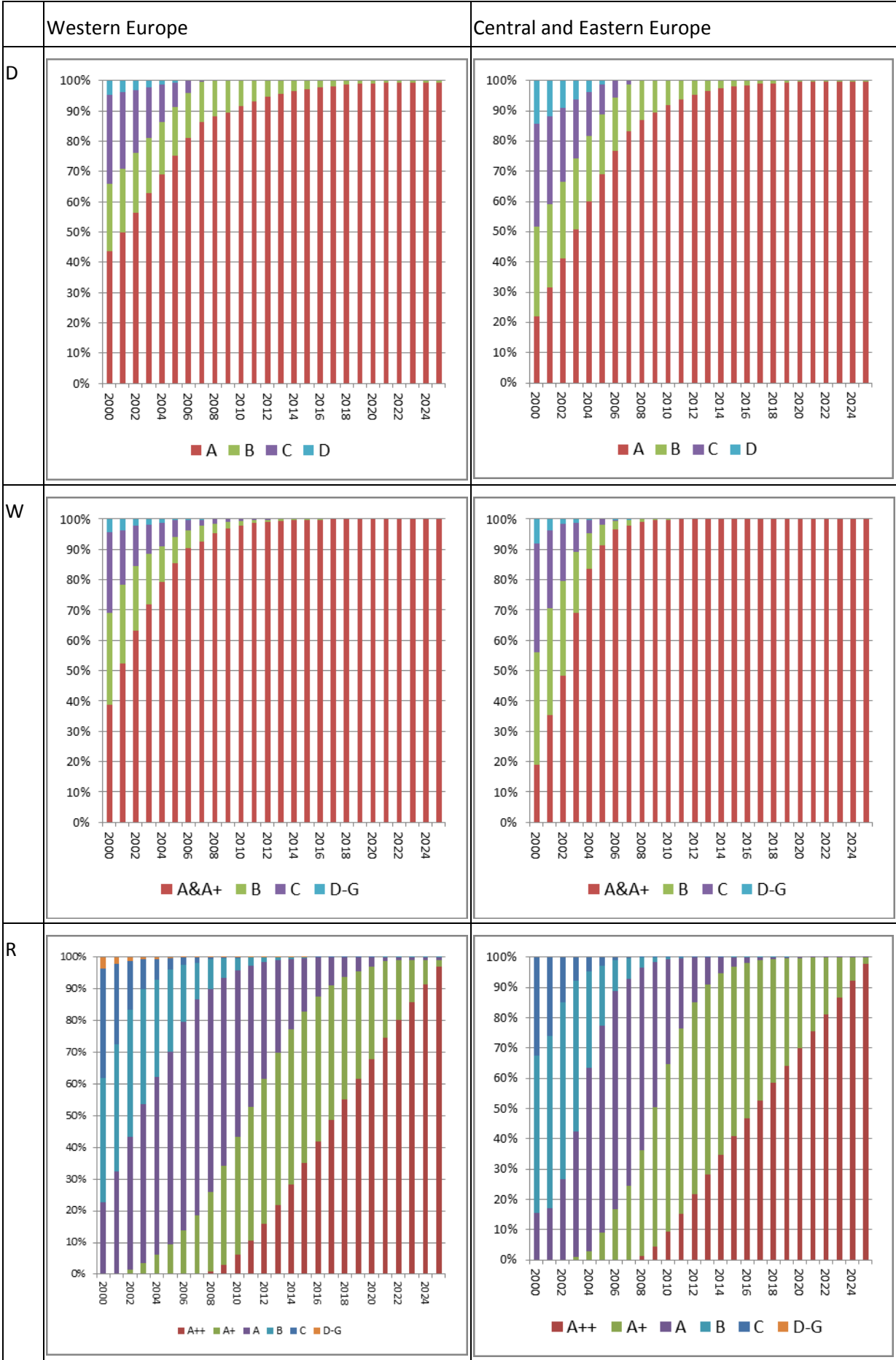


Figure 17: baseline energy class evolution

Figure 18 shows the resulting evolution in energy consumption (TWh/yr.) attributed to specific appliances for the EU-27.

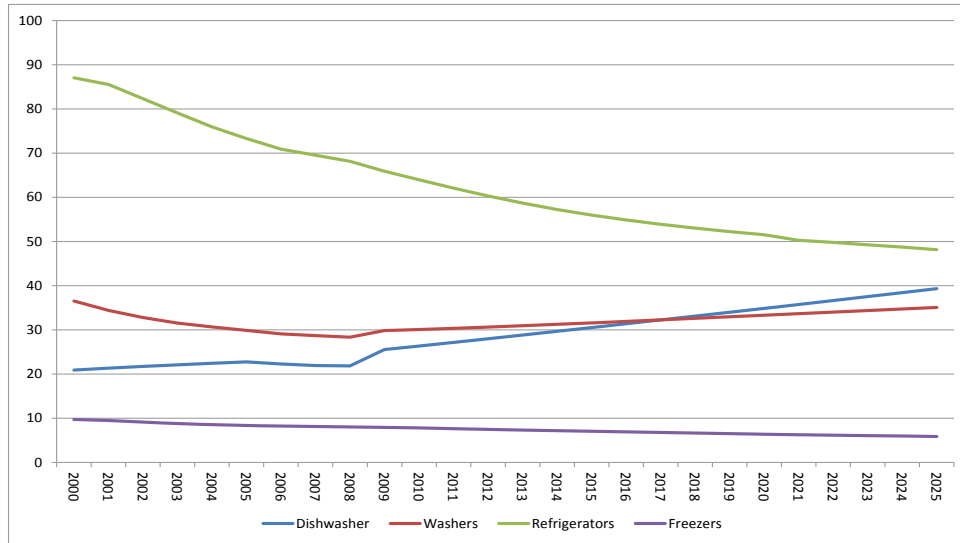


Figure 18: Baseline evolution of energy consumption by product, EU-27

Table 9: Baseline evolution of emissions and energy cost, EU-27

	Emissions				Energy			
	Washers	Dishwasher	Refrigerators	Freezers	Washers	Dishwasher	Refrigerators	Freezers
2000	15,7	9,0	37,4	4,2	36,5	20,9	87,0	9,7
2001	14,8	9,2	36,8	4,1	34,4	21,3	85,5	9,5
2002	14,1	9,3	35,4	3,9	32,8	21,7	82,3	9,1
2003	13,6	9,5	34,0	3,8	31,6	22,1	79,1	8,8
2004	13,2	9,6	32,7	3,7	30,7	22,4	75,9	8,6
2005	12,8	9,8	31,5	3,6	29,9	22,7	73,3	8,3
2006	12,5	9,6	30,5	3,5	29,1	22,3	70,9	8,2
2007	12,3	9,4	29,9	3,5	28,7	21,9	69,5	8,1
2008	12,2	9,4	29,3	3,5	28,3	21,9	68,1	8,1
2009	12,8	11,0	28,3	3,4	29,8	25,5	65,9	7,9
2010	12,9	11,3	27,5	3,4	30,1	26,3	64,0	7,8
2011	13,0	11,7	26,7	3,3	30,3	27,2	62,1	7,6
2012	13,2	12,0	25,9	3,2	30,6	28,0	60,3	7,5
2013	13,3	12,4	25,2	3,2	30,9	28,8	58,7	7,3
2014	13,4	12,8	24,6	3,1	31,2	29,7	57,2	7,2
2015	13,6	13,1	24,1	3,0	31,6	30,5	56,0	7,0
2016	13,7	13,5	23,6	3,0	31,9	31,4	54,9	6,9
2017	13,9	13,9	23,2	2,9	32,3	32,2	53,9	6,8
2018	14,0	14,2	22,8	2,9	32,6	33,1	53,0	6,7
2019	14,2	14,6	22,5	2,8	33,0	34,0	52,2	6,5
2020	14,3	15,0	22,2	2,8	33,3	34,9	51,5	6,4
2021	14,5	15,4	21,6	2,7	33,7	35,7	50,3	6,2
2022	14,6	15,8	21,4	2,6	34,0	36,6	49,8	6,1
2023	14,8	16,1	21,2	2,6	34,4	37,5	49,3	6,1
2024	14,9	16,5	20,9	2,6	34,7	38,4	48,7	6,0
2025	15,1	16,9	20,7	2,5	35,1	39,3	48,1	5,9

ANNEX IV: EXTERNAL EXPERTISE: MODELLING APPROACH

The impact assessment considered only a subset of the products covered by the Energy Labelling Directive – the selection is summarised in Annex III above.

Data were collected on the distribution of newly sold appliances by energy class for the selected product types (televisions, fridge-freezers, and washing machines) over the period 2000-2006/7 (in different cases) for western Europe and Eastern Europe (GfK data). Series were created for the proportions of people buying through each of the 4 channels (a) all-online, b) search online and buy offline, c) buy online after offline search, d) all offline). The impacts of the policy options on the four groups were modelled in the following manner:

- N_a - Customers transacting wholly online see information ‘for first time’ under the options 1-3 and are therefore most affected
- N_b - Customers searching online but buying offline see information before narrowing their choice and are second most affected, esp. by options 2/3
- N_c - Customers searching offline but buying online are reminded of information before purchase and are least affected
- N_d - Customers transacting wholly offline are unaffected

Matrices were created for each option corresponding to the ‘uplift’ group.

of each op

The baseline projections were obtained by combining regression-based forecasts of historical data with projections taken from the preparatory studies for these product classes. These were used to compute the ‘baseline’ evolution of product classes out to 2020. In the case of refrigerator/freezers and washing machines, separate computations were carried out for Western Europe and Eastern Europe to reflect the marked differences seen in the GfK data.

The model adjusts this evolution for the options as follows

- The proportions in each class of customers for different countries/regions and different types of appliance were initialised using data from Mintel, IEA-OECD and other sources
- These were projected forward using a model estimated from Euromonitor data on proportions buying major appliances online. Logarithmic and Logit specifications fit best; the models were used to project demand by channel, country and year (to 2020). For comparison purposes, these were then collapsed using projected total sales and sales-weighted averages to produce weighted averages for Western and CE Europe (to match the GfK aggregate data series).
- These projected data were used to scale the proportions in each class based on the assumption that the proportion (A:B) of those buying online vs. buying in the shop after searching online would remain stable (driven by heterogeneous differences in trust and desire to get personal after-sales service). The total buying Online (A + C)

would track the overall proportions buying online (from the prev. bullet). The total buying offline would go down to match this; the model also assumes that the current imbalance in favour of all-offline vs. search online would reverse by 2020 (from roughly 70:30 to roughly 30:70). This permitted the projection of proportions in each channel, appliance class and year.

- The aggregate impact of the options on ‘uplift’ due to online information was computed in the obvious way: multiplying each θ by the corresponding N and adding.
- Finally a simulation model was created for the distribution of efficiency classes by setting the baseline uplift to 0 and assuming that those affected by the new energy efficiency information would choose the highest energy efficiency class. An uplift of 20%, say, would move the proportion in the highest class 20% of the way from its baseline value to the maximum; the proportions in the other classes would be reduced in proportion to their share of the total sales projected to maintain balance.

Converting demand to energy consumption

Four (or more) sources of energy consumption data were used:

- CECED data on the energy savings due to new appliances and the production balance by class (not linked to countries or to each other)
- SAVE-ODYSSEE project data on energy efficiency trends in various countries by category of energy use
- JRC Energy Efficiency Report data on total residential energy consumption in the EU, its breakdown by type of appliances (applying only to the total stock, not new purchases)
- 4E (IEA) mapping documents showing changes in various (incompatible) measures of energy consumption and efficiency for different appliances.

Initially, energy consumption per appliance was used to ‘calibrate’ the changes in energy classes (by regressing e.g. the kWh/year for fridge-freezers or the kWh/wash for washing machines on the vector of proportions in the different classes). These equations would be used to project energy consumption forward and to adjust on the basis of distinguishing between appliances near 100% penetration (where only replacement sales are expected) and those still coming on-stream (where additional growth is driven by demographics, income, etc.). But the regressions greatly overestimated the reductions in consumption.

Details

- (1) Provision of information leads to ‘uplift’ in efficiency of purchased appliances (n = proportion of customers; θ = EEI ‘uplift’ due to information)

$$N = n_a \theta_a + n_b \theta_b + n_c \theta_c$$

where by assumption $\theta_a > \theta_b > \theta_c$.

- (2) N depends on age structure of appliance stock, replacement cycle length, degree of penetration, demographics of households/disposable income. If $X(a,e)$ is the stock of appliances of age a and efficiency e then

$$X_{n,t}(a,e,t) = \begin{cases} X_{n,t}(a-1,e,t-1) & \text{if } a < r \\ 0 & \text{if } a \geq r \\ X_{n,t}(r,e,t-1) + y(e,t) & \end{cases}$$

Where r is the replacement cycle length and y is the net number of new appliances (not replacements) purchased at date t . This assumes that all appliances are replaced when they reach age r (those not replaced due to dissolution of household, death, etc. are removed from y). The new additions are assumed to follow an efficiency distribution that updates the most recent distribution:

$$u(e,t) = X_{n,t}(a,e,t) / \sum_{e'} X_{n,t}(a,e',t)$$

This updating is assumed to follow the historical trend, with the following modifications: the rate of increase of higher-efficiency purchases under the baseline option is slower as a result of the growth of online shopping (this attenuation is in the order $a > b > c$); the rate of increase of higher-efficiency purchases is greater under the online options; the rate of increase is a concave function of t (saturation).

ANNEX V: DISPLAY OF THE LABEL AND TECHNICAL INTERFACE

Ensuring the display of the energy label in the online environment appears at first sight to involve both the design and the implementation of complex arrangements across a range of contexts, many of which are not under the direct control of suppliers and dealers. However, extensive stakeholder consultation on a range of options showed that the requirements of prominence, completeness, understandability and comparability can be met through only slight modifications of existing online marketing and sales practices, which can be accomplished as part of normal commercial e-commerce systems maintenance.

The key to achieving this is to clearly specify the final look and feel of the online displays – leaving implementation to the (commercial) experts. Given that the media employed in the offline and online environments differ by definition, it is impossible for the latter to mimic the former identically; there are different ways of restoring equivalence while trading off any cost implications against the potential for market development of additional value added services.

Display of the label

A specific issue for the online environment is the design of the display and presentation order of the energy class, label and fiche information; while this is the same for all customers in all stores in the offline environment, online customers using e.g. computers, tablets or smart phones are presented with different display environments. As a result, the impacts of a ‘uniform’ approach (e.g. inclusion of a graphic showing the label or a graphic showing the product with the label attached) will be very different in different environments.

The Directive and the product-specific delegated acts are quite specific about the design (size colour, layout, location etc.) and content of mandated labels. However, with the size specified neither fiche nor label would be legible on most computer screens and would be visible only as an indistinct blob on most handheld devices. This may be neither practical nor user friendly for online customers. More fundamentally, the provisions in the Directive aim at three complementary factors:

- (a) Content – providing reliable, relevant and useful information when it is needed;
- (b) Coverage – ensuring that all consumers of all competing products see the information;
- (c) Uniformity - use of a single simple and recognisable design to facilitate comparison.

Provisions for the online environment should therefore ensure that the contents and their provision be precisely as specified. The extension to the online context is intended to ensure coverage. To promote uniformity, design specifications mandated for situations where consumers can see the goods before purchase should be supplemented by a requirement for

online dealers to ensure that the information is provided in legible and comprehensible form without additional effort on the part of the consumer. This design needs to be uniformly recognisable, taking into account the specific circumstances of online environments –with screen sizes and user interfaces ranging across smart phones, tablets and PCs



Figure 19: Energy class display (Against product)



Figure 20: Label Display (Click through)

Smart Phone display examples



Figure 21: Energy class display (Against product)



Figure 22: Label Display (Click through)

Touch screens on tablets and smart phones allow the displayed information to be enlarged by users.

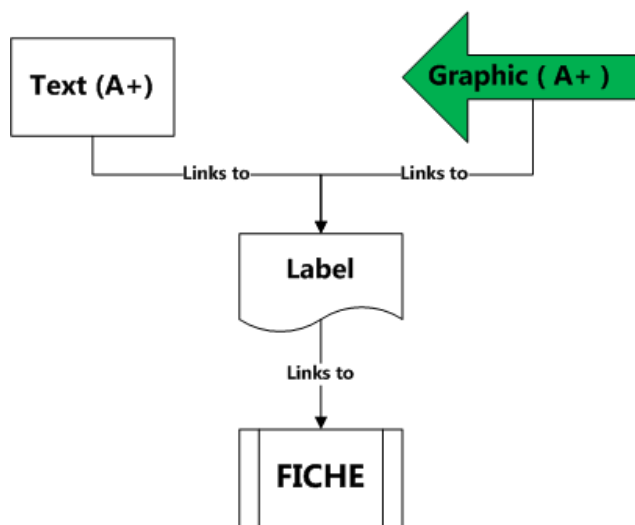
Technical interface

Information and graphics will be displayed and interacted with using all the standard and appropriate means and mechanisms of the Display technology.

Using all the standard and appropriate means and mechanisms of the Display technology the following Information hierarchy must be capable of being made available and interacted with:

- 1. **Text** (e.g. A+)
- 1.1. **Graphic** (egg A+ set in a graphic)
- 1.1.1. **Label** (egg: Graphic representation of the appropriate label)
- 1.1.1.1. **Fiche** (egg: Full text providing detailed information related to the product)

The baseline available interface interaction flow for this hierarchy should be:



For traditional “PC” computers these interface mechanisms include but are not limited to:

- Mouse clicks
- Mouse overs
- Keyboard
- Voice interface
- Touch (rare but increasing)
- Eye movement and activity monitoring
- Movement related interactions
- Remote access

For tablets, Smart phones and Touch screen technologies these interface mechanisms include but are not limited to:

- Touch / Tap (Single and multi)
- Gestures / swipe (On screen or virtual screen space)
- Onscreen keyboard
- Virtual keyboard
- Voice
- Eye movement and activity monitoring
- Movement related interactions

- Remote access

For future “Virtual Interfaces”, such as light projected keyboards, holographic displays and human / machine capabilities, the display and interactivity must deliver similar and equivalent display and interaction opportunities and performance as legacy systems, using mechanisms appropriate to their technical capabilities.

ANNEX VI: DETAILED ANALYSIS OF IMPACTS

This annex presents further discussion and data related to short-, medium- and long-term impacts, as well as providing an overview of the impacts of all options.

Additional discussion and data on short-term impacts

In addition to the discussion on short-term impacts in the main body, the following evidence is presented.

Beyond the allocation of customers to different channels when online channels are used, there is an overall trend towards making major appliance purchases online (this combines channels A and C). Figure 23 shows baseline data for the proportion of customers buying at least one major appliance online in the European Member States. Czech Republic and UK are much higher than other countries, but show signs of levelling off (especially UK). Online purchasing in the Netherlands is high but fairly stable, while use of online channels is accelerating sharply in Denmark.

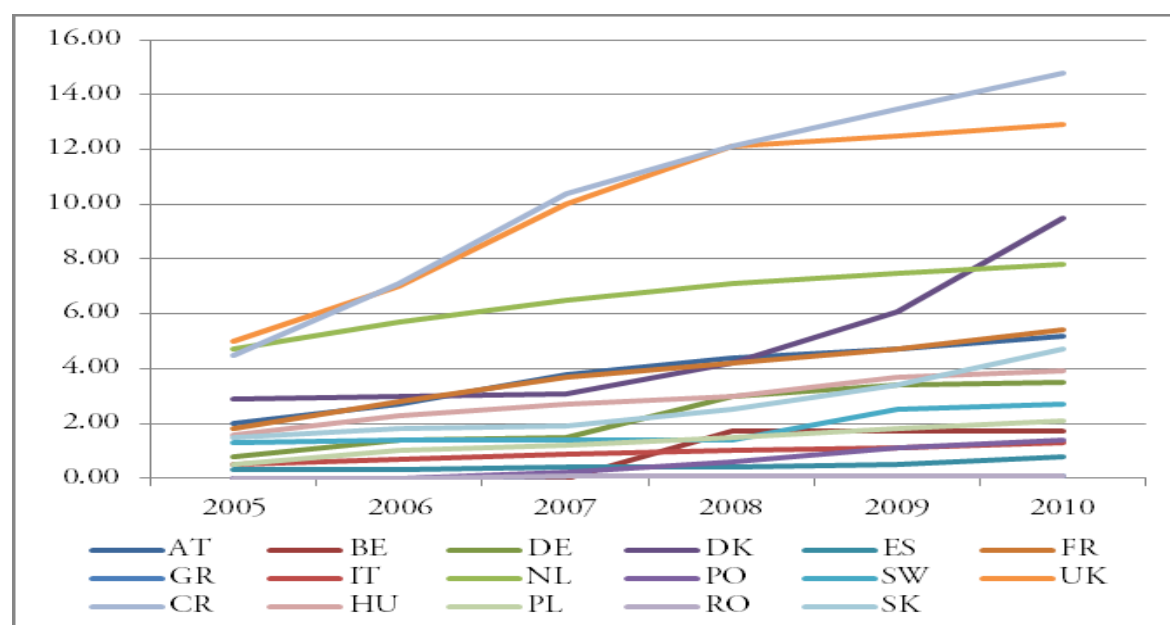


Figure 23: Growth of online purchases of major appliances by country

Mintel data⁵² in Table 10 show the correlations between ranking energy efficiency highest or second highest among purchase attributes and the propensity to use each of the channels, for different demographic characteristics (values listed in right-hand column).

Table 10: Correlation of energy efficiency demand with purchase channel

	A	B	B+D	A+C	Characteristic values

⁵² Source: Mintel Oxygen reports (home retailing) May 2012.

	A	B	B+D	A+C	Characteristic values
Age:	49.3%	67.5%	21.0%	61.8%	15-24, 25-34, 35-44, 45-54, 55-64, 65+
Socio-economic group:	83.6%	91.5%	55.3%	87.7%	AB, C1, C2, D, E
Life stage:	71.8%	81.4%	-4.9%	81.1%	Pre-/no family, Families, Third age, Retired
Age of own children in household:	31.1%	39.8%	55.4%	53.0%	0-4, 5-9, 10-15, any 0-15, No children
Special groups:	95.3%	75.8%	13.2%	91.9%	ABC1 pre-/no family, ABC1 families, ABC1 third age, ABC1 retired
Working status:	50.6%	16.4%	15.0%	31.9%	Working, Full-time, Part-time, Not working, Retired
Household tenure:	89.9%	99.8%	65.5%	96.7%	Owned outright, Buying home, Renting
ACORN group:	73.7%	64.5%	78.9%	79.2%	Wealthy Achievers, Urban Prosperity, Comfortably Off, Moderate Means, Hard Pressed

These data show strong correlations between environmental awareness and concern and use of Internet purchasing channels. This is reflected in:

- The proportion of planned and emergency purchases, because planned purchases are more likely to involve deliberate comparison of attributes, and are more likely to include an online component;
- Changes in the purchasing behaviour of customers in each channel; and
- Secular trends in the efficiency of appliances and patterns of energy consumption – (from the most recent JRC Energy efficiency and consumption report) shows the change in total residential energy consumption over the period 1999-2007 in TWh and as a proportion of the 1997 level.

The data show strong differences mostly consistent with differentials in economic growth and disposable incomes. For instance, much of the residential demand in CEE countries represents new rather than replacement purchases.

Another factor affecting both the impact of the ELD and its Delegated Acts and the consequences for the environment is the rapid growth in energy consumption. The data in Table 11 give an overview of the patterns across Europe. It is interesting to interpret these in relation both to economic performance and to the absorption of energy-efficient appliances.

Table 11: Residential energy consumption changes 1999-2007

Country	Change (TWh)	% increase	Country	Change (TWh)	% increase
Sk	-18.86	-333%	Es	57.54	127%

Country	Change (TWh)	% increase	Country	Change (TWh)	% increase
Bg	-7.31	-72%	Pl	26.77	129%
Be	-6.93	-30%	Hu	14.41	147%
Se	-1.31	-3%	Gr	33.17	246%
EU-15	12.97	2%	Ro	31.79	403%
UK	4.3	4%	Pt	45.57	479%
De	6.72	5%	le	34.18	569%
Fr	14.83	12%	Si	26.61	1113%
It	10.71	18%	Lt	30.65	1622%
NMS-12	14.81	19%	Ee	30.08	2212%
Cz	4.26	30%	Lu	23.01	3384%
At	5.85	44%	Lv	56.41	4905%
NI	13.79	65%	Mt	26.3	5058%
Fi	16.51	89%	Cy	68.91	7254%
Dk	12.14	125%			

It is clear from this table that residential energy consumption growth is quite high in many of the New Member States; of course, a large part of this can be explained by recent and rapid increases in living standards. The same pattern applies to the purchase of energy-efficient appliances. However, while this might seem like a persuasive argument for a strong and direct linkage between awareness of energy costs (the combination of rapid increases driven by the penetration of ownership of energy-related products with soaring energy prices), it is equally necessary to acknowledge the ‘leapfrogging’ effect; countries where many households are buying these goods for the first time have a smaller stock of old and inefficient (but long-lived) appliances. Worth noting, as well, is the relatively high proportion of online shoppers in these countries.

Simulation of quantitative impacts

The impact assessment uses a simulation model based on the data in Table 12.

Table 12: Main data sources for projections

Variable	dimensions	Source and notes
Proportions in each channel	countries/regions, different types of appliance	Mintel, IEA-OECD, Nielsen Detailed breakdowns by demographics available for some countries; limited time series
Online purchasing of major appliances	Country, data	Euromonitor Used to create time series projection model
Impact of information per channel	Channel, appliance type	SAVE-ODYSSEE, GfK, personal communication Used to initialise impact matrix – updated per option
Energy class of new	Class, type of appliance,	CECED, IEA

Variable	dimensions	Source and notes
appliances	region, date	
Energy efficiency	Date, type of appliance	Trends: SAVE-ODYSSEE By appliance class: 4E (IEA) mapping documents, Prep. Study analyses
Energy savings due to new appliances	Date, appliance type	CECED, Prep. Study analyses
EU energy consumption	Total, By appliance (total stock only), country, date Specific consumption per year, wash, etc.	JRC Energy Efficiency Report 4E (IEA)
Importance and influence of energy efficiency labels	Demographics, Country	GfK, CECED, Fraunhofer-ISI, Prep. Study surveys

Figure 24 and Figure 25 show the proportional impact of option 2 a and 2b on the purchases of the highest class of three products over time as a percentage of the baseline proportion. In this graph, the impact on cold appliances (refrigerators and freezers) is far larger than that on the other products (which are nearly saturated in terms of rating). The decreasing apparent impact on cold appliances is a result of expanding penetration (current levels of purchase will taper off) and inventory updating; under the baseline the sales of new appliances tend to saturation at the highest modelled rating. This does not, of course, mean either that energy efficiency will not continue to improve (it will due to improvements within the top rating) or that labelling will cease to be effective. In contrast, the impact on washers and cold appliances (where penetration tends to be greater) is growing as a result of replacement demand. It does, however, mean that ratings alone will cease to exert much impact and therefore that more informative options (e.g. those making detailed label and fiche information visible accessible and usable) will prove even more influential over time.

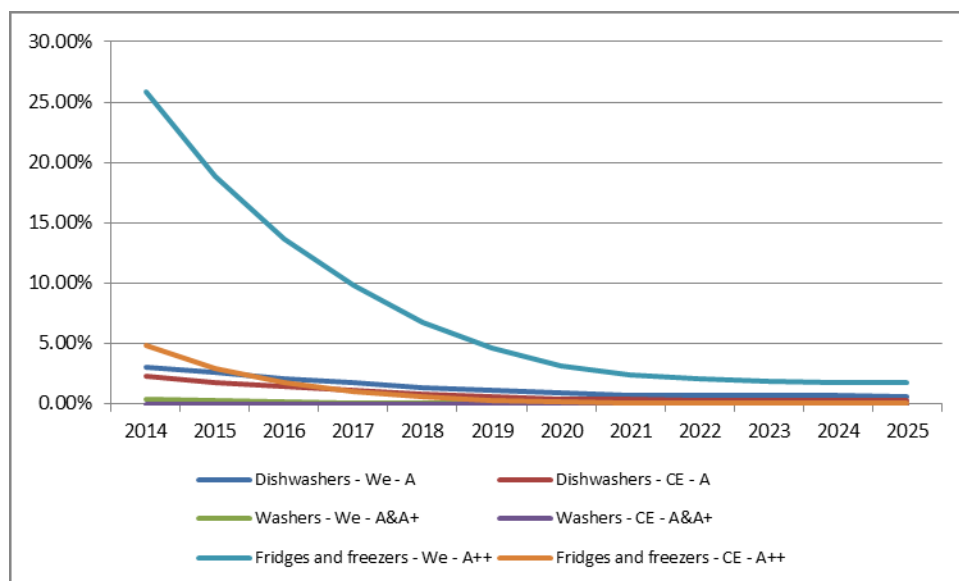


Figure 24: Proportional impact of Option 2a on top-rated appliance sales

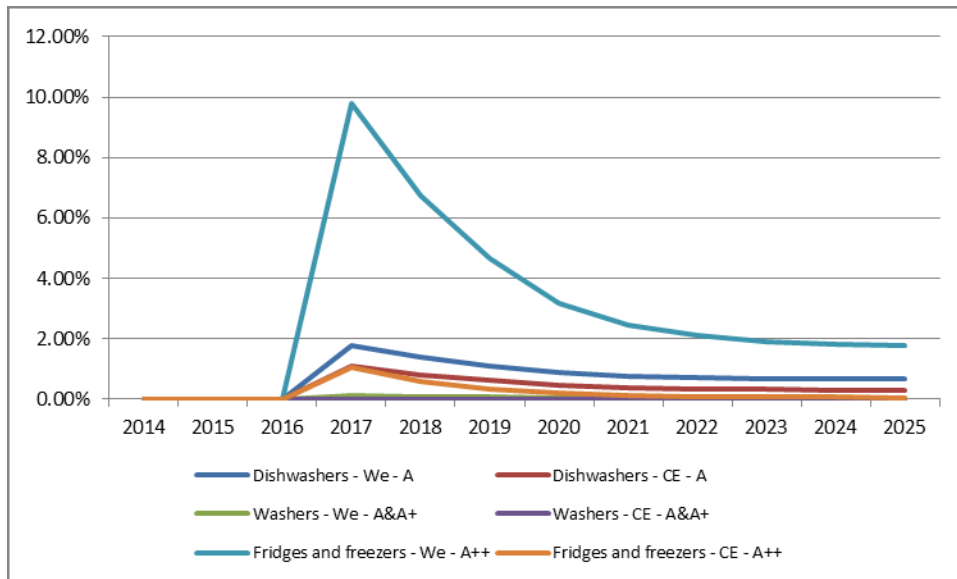


Figure 25: Proportional impact of Option 2b on top-rated appliance sales

The baseline projections and those shown in the figures above were made by using regression equations to project the proportions of customers in each class, the baseline distribution of energy classes and the trends in energy consumption and efficiency. The relation between the distribution of energy classes and consumption was estimated by multiple regression (including time trends and energy prices).

The options were simulated by explicit assumptions on the impact of information by option and by channel. These included the responsiveness of customers in different channels to energy-related information [pure online (A) > Search online, buy in store (B) > Search in stores, buy online (C) > pure offline (D) = 0]. The impacts were based on data showing the proportions of individuals ranking efficiency high among the list of product characteristics, taking into account as well the correlations among demographic characteristics, priority attached to environmental considerations, responsiveness to information and the likelihood of consulting online sources. These were used to adjust the proportions in energy classes using a flexible accelerator mechanism; the highest (band of) classes was assumed to increase, with proportionate reductions⁵³ in lower classes.

The time-paths of energy consumption follow similar profiles. The results have been calibrated to produce aggregate impacts on energy consumption or average efficiency per country and appliance type. Because the results are consistent with those in other impact assessments but depend on a range of explicit assumptions and limited data, we retain the model and a large database of computations but only provide a few relevant outputs here. In other words, the results should be viewed as confirmation of the more detailed qualitative analysis.

The overall environmental impact of the Directive can be obtained from the flows of equipment of different energy efficiency ratings (and vintages) into the appliance stock; each

⁵³ Empirically, this should reflect the additional price per class and energy prices; data limitations and the 'levelling' effect of class divisions currently make these relationships statistically unreliable.

vintage is weighted by average energy consumption per year. In principle, these parameters could be adjusted for differences in the frequency of use (e.g. if the process of researching and/or buying an energy-labelled appliance online sensitises customers to energy costs and leads them to e.g. run devices only when full or during off-peak times). In much the same way, the Preparatory Studies provide a wealth of detail that can be used to compute the energy consumption (and other environmental impacts) associated with many specific types and models of energy-related product; in some ways, this is better for predicting market outcomes, since for many of the products consumption decisions are driven by price, functionality and appearance and only modified by environmental considerations. However, in almost every case the market information required (at the necessary level of detail) to estimate product-specific or hedonic (function- and feature-orientated) demand functions is lacking.

A greater problem arises from the static and discrete nature of the ratings themselves. To compute energy use accurately requires both recalibration of energy ratings to actual energy use and an interpolation to differentiate the average energy use of a modern and an older appliance of the same rating. This is important because of the linkage between age, performance and replacement or upgrade cycles. The existing stock is fairly old, and the attachment of individuals to the products they own limits their willingness to seek out replacements. This dilutes the impact of current changes in purchase patterns. However, the current levels of energy use also provide only a partial picture of the lifetime consequences. This depends on two further factors; the rate at which energy performance will increase in the future and the frequency of upgrading.

The same computation can be performed on an inventory model basis; for example, if replacement occurs on a 12-year cycle, the energy use associated with a purchase today is 12 years' consumption at the current rate followed by 12 years at the next rate, etc. If the provision of more information accelerates the replacement cycle, the window before upgrading is shorter – but the more rapid long-term improvement in energy use is then offset by the depreciation loss on appliances owned for a shorter period of time and having in most cases little residual value. Clearly, also, the results will be very different for different products, especially for those driven by rapid feature improvement and 'early adopter' trends. In this regard, for example, it has been noted that the increased energy efficiency per cm² of screen area in televisions and monitors has been more than offset by the market trend towards ever-larger screens, resulting in increased energy consumption per device and a potential rebound effect: providing energy efficiency information can induce customers to justify the purchase of larger screens than they otherwise would on the grounds that the technical efficiency is better, so the environmental and operating cost increases less than proportionately to the viewing area.

The tables in section 7 **Error! Reference source not found.** show the evolution of energy use, emissions (CO₂) and energy cost associated with the baseline and the two options. These preliminary estimates do not take into account reactions by suppliers, dealers and other intermediaries and make very conservative estimates of the 'reach' of the proposed measures.

Note that the magnitudes of these effects are broadly consistent with those identified for labelling per se in the ELD impact assessment.

It should also be noted that other, dynamic rebound effects of labelling and subsidised replacement/scrappage programmes are possible; in the period leading up to a step improvement in energy efficiency, encouraging replacement reduces individual energy efficiency by ‘locking in’ lower performance⁵⁴.

Finally, if the ‘educative’ and/or sensitising effect of information is persistent, there is likely to be a reinforcing effect on future purchases; the individual who chooses the better-performing products today is more likely to choose from the upper range of the distribution when the time comes to replace it; those choosing lower-rated appliances today may choose better ones in future if the price/performance ratio improves. In any event, making information more available and amplifying the advantages of upgrading (especially to similar or replacement appliances to overcome psychological attachment to or inertia regarding current appliances) may increase the overall pace of replacement as well as the channels through which it occurs.

Better and wider comparisons

The online channels allow head-to-head comparison of or search among a far greater range of appliances, and thus the extent to which competitive pressures can favour enhanced performance. This is particularly true of ‘standard’ appliances for which features tend to be fairly similar or difficult to relate to actual differences in consumer utility. In this setting, price and energy use have the distinct advantage of characterising all possible choices and being fairly easy to compare and to relate to cost and other shared values.

The short-run impact should therefore be the emergence of distinct submarkets stratified along energy efficiency lines; if the options are successful, competition will be keener and consumer surplus higher for the better-performing products, even if energy savings are not taken into account.

Over time, this will reinforce the tendency of even less environmentally aware consumers to choose better products⁵⁵. In the present case, a similar rebalancing may be anticipated between online and offline dealers; as the former provide recognisable labels (serving as a trustmark for online commerce) and enhanced information, their market share should grow. This will produce a positive feedback between the online channels and better consumer decisions while at the same time advancing the Digital Agenda goals with regard to e-commerce.

⁵⁴ It is possible to derive analytically the optimum pace of technological advance and price trajectories under assumptions about individual preferences, competition, energy prices and the availability of information; the change in the optimal (equilibrium) outcome when information availability improves thus provides a precise measure of the economic and energy use consequences of one of the options described here. But the analysis goes beyond present scope.

⁵⁵ A further ramification is that this migration to the mainstream of the market towards better performance may facilitate more rapid increases in the minimum level of performance expressed in successor Ecodesign Directives and procurement policies.

On balance, however, the more likely result is that the combination of large transactions costs, the need for a durable point of contact through the life of the product and traditional reliance on physical stores' service models will mean that most market growth will involve hybrid models where the dealer side is represented by a store with both on- and offline presence. The online component will enable the dealer to participate in consumers' research (to choose a model) and search (to find a dealer and an attractive offer). The offline presence will provide look-and-feel reinforcement⁵⁶ and purchase fulfilment. This will be reinforced by the anticipated uptake of such information by automated search engines, filtration, costing and comparison engines.

Overall short-term assessment

- High and growing proportions of buyers are aware of, pay attention to and are influenced by labels.
- Those most likely to respond to this information tend to be those most likely to use online or hybrid shopping.
- Purchasing behaviour is influenced by appliance prices (the shadow price of energy savings), the cost consequences of buying more efficient appliances (and thus local energy prices) and by the unquantified 'eco' argument⁵⁷. In addition, customer willingness to pay is influenced by societal factors and marketing. The online and offline environments differ significantly in this respect; thus the response to equivalent products for which the same objective information is available may be different in the two settings.
- The price premium for more efficient appliances varies strongly by country, in proportion to variations in the overall level of appliance prices. It is plausible, but not proven, that the options discussed here will increase the level of competition in appliance markets and reduce both the premia and regional disparities.
- A German study of implementation of the previous Directive⁵⁸ considered voluntary online information provision and found that online and hybrid suppliers were more likely than their offline counterparts to make complete information available (i.e. online compliance is greater than offline compliance). This combines with the lower cost of monitoring to favour the options. The study did note that the information was less likely to conform to legal specifications of size, placement and format.
- CECED studies suggest that online users are better able to handle non-standardised information (though on balance the consensus is that standard formats are always needed). Industry marketing and policy evidence shows that online shoppers prefer

⁵⁶ Recent experimental evidence shows that consumer willingness-to-pay for some kinds of products is greater in the physical presence of the good than with either text-based or graphic presentations. See e.g. Bushong, B., King, L., Camerer, C. and A. Rangel (2010) "Pavlovian Processes in Consumer Choice: The Physical Presence of a Good Increases Willingness-to-Pay" *American Economic Review* **100**: 1556–1571.

⁵⁷ In other words, purchase premium, local energy prices and energy class are all significant and positive influences on energy-sensitive buying behaviour. It is not yet clear whether price premia for efficient appliances outweigh the energy savings; they do differ strongly by country.

⁵⁸ Schlomann et. al. 2001.

more concrete and useful information; they like being able to explore and customise their comparisons. This argues strongly in favour of Option 2.

- There are major differences among countries in the effectiveness of labels and in overall energy consumption patterns. Some of the Central and Eastern European Countries started from a low base as regards appliance efficiency but caught up very fast (in part because penetration and incomes were both very low to begin with, so most purchases were close to the efficiency frontier. The Central and Eastern European Countries make heavy use of the Internet for appliance shopping compared to Western Europe. On the other hand, there are distinct laggard countries in both regions whose performance in terms of both energy efficiency and Internet use is much lower. Perhaps this is an argument for a uniform regulation, but also highlights the dependence of progress on improving Internet access.
- There does not appear to be a stable cross-sectional relation between Internet use and energy efficiency. Both are trending up over time, but this does not indicate a causal relationship or that the benefits of the options considered here will already be produced by the growth of e.g. broadband access and service quality.

Factors limiting the impact of the options

- Purchases are divided between considered (new and replacement) purchases and 'emergency' purchases. The latter are much more likely to be offline and not as thoroughly researched (therefore by assumption less affected by the options). This limits option impacts, especially under economic conditions that lengthen replacement cycles, thus retarding the growth of efficiency in the stock and increasing the probability of emergency purchasing.
- Energy classes are becoming saturated - almost all production is in the top classes and most purchases are converging quickly. Thus the differential impact of the options is somewhat limited. But this only applies to the classes themselves. On-going improvements within the top classes are not picked up by the ratings. This weakens progress incentives, but also accounts for the poor statistical quality of the relation between ratings and energy consumption.
- Impacts are to some extent affected by penetration rates, especially among specific appliances (e.g. refrigerators as compared to air conditioners). While complete data covering the full range of appliances covered in the current Directive (especially electronics) are not yet available, it is clear that new purchases of efficient appliances increase average efficiency by less than replacement purchases in the same energy class and also that (*ceteris paribus*) new appliance purchases increase total consumption. It is not clear whether emergency replacements are better or worse than new purchases; they may have lower efficiency, but are likely to exceed average efficiency and do not create new demand.
- There is little or no evidence on the impact of the options (or labelling) on replacement cycles. A number of studies consider the interaction and *combined* effectiveness of e.g. turn-in programs and ecodesign and public procurement measures. But these studies consider labelling in general and are hard to relate to the online options.

- There is some evidence that awareness of and familiarity with labelling programmes accompanies greater sensitivity to energy costs; the availability of the tags might thereby influence the way the appliances are used (leading to durable increases in energy awareness); however, there is no concrete evidence of the prevalence or magnitude of this effect.

Costs for manufacturers, dealers and others

These proposals do not change the coverage of the Directive in terms of appliances or create obligations to produce new information. Therefore, they are not expected to give rise to significant implementation costs. Likewise, the cost of producing graphics and other electronic files required to convey the necessary label and fiche information is already sunk when complying with the existing Directive. There may well be web design and consumer behaviour study costs. We have not estimated these because none of the options requires or restricts manufacturers from carrying them out for their products, dealers from carrying them out across their product range or search and comparison site providers developing means of collecting the necessary information and presenting it in a suitable fashion.

Many of these costs are currently incurred by those providing such information voluntarily; requirements for uniform provision may therefore reduce these through economies of scale and scope while at the same time improving the uniformity and comparability of the information provided.

Eventually, as a result of market competition, providers of online search and comparison information will face incentives to collect (at a minimum) energy rating information and to ensure its prominent display when search results and comparison tables are presented. They may also provide capabilities for users to narrow their searches or rank their comparisons by energy efficiency class. This generates web design and implementation costs (again, we do not estimate them). The conversion of energy efficiency and consumption information into equivalent operating costs is also likely to be costly, especially in view of the need to develop and convey clear and meaningful usage scenarios and to reflect local energy prices. As this information is voluntary, any cost will be covered by enhanced revenues.

Small and medium-sized suppliers of innovative goods are likely to benefit. Option 2 allows them to highlight the ‘inframarginal’ advantages of their products throughout the dealer network, but does not overcome the access barriers many face in gaining access to large dealers (hybrids and hypermarkets). Market forces may reduce the height of this barrier, since search and comparison engines will pick up their products; those who produce particularly good products or deliver environmentally-sound products on a consistent basis may be able to reap ‘breakout’ success as the new provision of innovative and useful information builds societal awareness (analogous to the rapid growth of organic and ‘green’ SMEs). By contrast, the levelling of the playing field involved in moving away from Option 0 may disadvantage high cost SMEs, including those for whom the voluntary provision of such information was a way to stand out.

Additional discussion on medium- to long-term impacts

In addition to the discussion on direct medium- to long-term impacts in section 5.5, the following evidence is presented regarding likely indirect effects.

Beyond the direct effects described in section 5.5 is a dynamic coevolution. The arguments for a clear and easy to compare label remain compelling, but the static nature of classification and the steady progress of technology are gradually reducing the variance of performance levels (as measured by the rating) and thus its perceived relevance. At the same time, more detailed information – particularly when not available for electronic processing, computation and comparison – is harder consistently to compare and can lead to confusion, attenuated ability to identify and implement more eco-efficient buying practices and other forms of market failure. Indeed, given the continual evolution of power markets and the convergence, interoperability and integration of energy-related products, it is quite possible that even the detailed current performance indicators mandated in the label and fiche descriptions will need to be replaced by others. Given these factors, it seems evident that

- Mandatory provision of a minimum level of accurate, reliable, easy to compare and relevant information must continue;
- This information should be available in equivalent form in all circumstances where likely to determine or strongly influence consumer decisions;
- The reliability of the information can be enhanced if it constitutes a material part of the consumer contract (e.g. the formal offer) – this may be challenging in online and mobile environments, where the assurance provided by written documentation may be lacking.
- For online environments, alternative forms of information may be more useful, relevant, reliable, etc. This may be particularly important as consumers face more complex purchase decisions and/or identify new types and combinations of relevant information. This suggests an online extension that should establish a floor of minimum required information described in specific ways (though possibly in alternative ways as well) but which allows innovative approaches when they can be shown to offer at least equivalent protection for consumers and incentives for environmental progress.
- This process of innovation can be partially left to the market – it may be in the interests of competing dealers, etc. to look for information that consumers find useful.
- However, there are a number of limitations to a laissez-faire approach. The first concerns neutrality – one advantage of mandated minimum information disclosure is that it treats all customers equally and only discriminates against products or producers on the merits of their products⁵⁹. A second concerns complexity – the great variety of voluntary eco-labelling schemes and the evidence cited in the Preparatory Studies of highly variable levels of awareness, understanding and trust suggest

⁵⁹ In this respect, it may have advantages compared to e.g. minimum environmental performance standards, which may disadvantage small and/or innovative suppliers if they are not carefully drafted. In addition, such standards may concentrate too narrowly on the characteristics of individual products and neglect the way they function in combination or the extent to which actual usage patterns may lead to worse results.

strongly that such schemes may complicate or frustrate consumer choice and may even ‘crowd out’ better types of information. These possibilities are illustrated by two plausible scenarios:

- The optimistic possibility is a race to the top – sellers of energy-efficient products (and stores that stock a good variety of products) will try to deploy useful and clear information that is relevant to consumers, easy to comprehend and consistent at least within product classes. This might include lifetime cost of ownership⁶⁰ for products where usage patterns do not vary greatly (e.g. cold appliances) but might be cost/load or costs associated with a variety of usage patterns for products where users have more discretion (e.g. washing machines, dishwashers, televisions). As integration proceeds (e.g. smart meters), such information could also indicate the savings available through optimised utilisation. Initially, the aim might be to boost prices for better-performing products by highlighting their superiority; ultimately competition should whittle down these margins because almost the whole market could make comparisons. Beyond this, such information would tend to empower users and therefore: make them more aware of the energy considerations of other purchases; and more likely to pursue environmentally-responsible patterns of use as well as purchase.
- A far less attractive prospect is a race to the bottom, which can occur if consumers seek to discover and act on comparative eco-performance information, but are frustrated by suppliers or dealers (tacitly) colluding to provide complex, misleading or highly differentiated information intended to frustrate head-to-head competition⁶¹. Better products will still command higher prices but
- Decisions will not always favour the ‘best’ products (because consumers cannot tell which is best);
- Consumer search will not always lead them to the ‘best’ dealers (because idiosyncratic information raises search/comparison costs and reduces consumer mobility);
- Higher prices will not be eroded by competition (current data show big national differences in the shadow price of a higher energy rating); and
- The suppliers’ incentives to produce better products and/or better/more information will be weakened as well

⁶⁰ based on local energy prices, and thus requiring input from dealers, government, energy companies, etc. as well as large-scale suppliers.

⁶¹ An example of complexity is provided by the excessive variety of insurance policies or mobile phone tariffs; an example of misleading information is mileage ratings based on highly unrealistic driving scenarios – it is not that the information is inaccurate, but that it does not indicate how rapidly and under what circumstances performance will deteriorate under realistic conditions – thus even the ordinal ranking of vehicles cannot be determined with certainty and the competitive importance of the information has declined.

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