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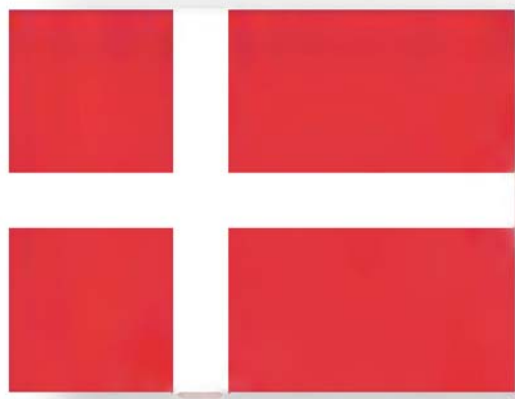**2022 Country Report – Denmark**

Accompanying the document

Recommendation for a COUNCIL RECOMMENDATION

on the 2022 National Reform Programme of Denmark and delivering a Council opinion on the 2022 Convergence Programme of Denmark

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Denmark

2022 Country Report

ECONOMIC AND EMPLOYMENT SNAPSHOT

Robust recovery facing some headwinds

Denmark benefited from a prolonged period of sustained and balanced economic growth before the COVID-19 pandemic. In 2019, Denmark's per capita GDP was 176% of the EU average, with only two EU Member States ahead of it. Economic growth was solid, averaging 2.5% in 2015-2019, well above the EU average. However, prior to 2015, the 2008 financial crisis — combined with a housing market bust in Denmark — had led to prolonged sluggish growth, with average GDP growth of 0.9% between 2011 and 2014 (Annex 18).

The COVID-19 pandemic had a significant impact on Denmark, albeit less than in many other EU Member States. While exports saw large declines, consumer spending contracted only moderately thanks to the policy measures taken, and housing construction and public investment boomed in 2020. The economy recovered strongly, with economic output having already returned to pre-pandemic levels in the second quarter of 2021 and real GDP rebounded at a rate of 4.7% in 2021 overall.

The strong Danish recovery is causing major labour shortages. The unemployment rate decreased by 0.5 percentage points to 5.1% in 2021. An effective wage support scheme helped avoid significant lay-offs and any major surge in unemployment. As economic activity resumed swiftly following the easing of restrictions, employment has been increasing steadily and unemployment has fallen to one of its lowest rates since 2008 as evidenced by the Social Scoreboard under the European Pillar of Social Rights. High demand for labour has led to labour

shortages across the economy: recruitment challenges were already widespread in construction and parts of other industry sectors since autumn 2020, and shortages in the services sector have further emerged after the reopening in spring 2021.

Graph 1.1: **Total employment**
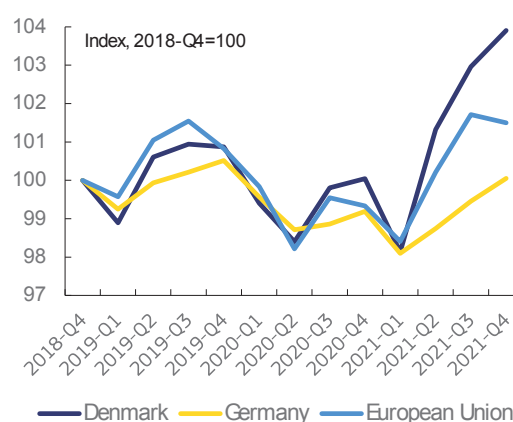
(1) Total employment rate, non-seasonally adjusted
Source: Eurostat (Quarterly national accounts)

Consumer price inflation has been on an upward trend since early 2021, but still remains below the EU average. The increase is driven mostly by energy and commodity prices, but other factors are also contributing. The ongoing pressure on global supply chains has resulted in rising industrial goods prices. Combined with a marked increase in food prices and a hike in cigarette duties, inflation increased from 0.4% in 2020 to 1.9% in 2021. A steep increase in inflation is expected in 2022, mainly due to further rise in energy, food and raw material prices caused by Russia's invasion of Ukraine with inflation projected to reach 5.1% in 2022. Although inflation is expected to moderate next year due to a levelling-off of energy prices and normalising supply chains, labour market pressures could nevertheless drive higher wage growth, potentially adding to inflationary pressures.

Russia's invasion of Ukraine constitutes a major downside risk to the economic situation. Surging energy and commodity prices, supply-side restrictions, increased uncertainty and the slowdown in Denmark's main export markets could dampen business investment and household consumption. On the other hand, the Danish fiscal position is strong, and the slowdown could be partly offset by increased government spending in the areas of public investment and defence. The arrival of people fleeing war is expected to be accommodated through additional government spending.

The Danish economy is advanced in terms of smart, sustainable and inclusive growth, but not without challenges. The green transition, digitalisation and innovation provide unique opportunities for further boosting productivity, job creation and health benefits. Denmark faces significant investment needs and policy challenges in particular to achieve its ambitious climate objectives, both as regards the circular economy (Annex 7) and green research and development (Annex 9). Improving skills in the labour force (Annex 12) and addressing labour shortages are key to fostering sustainable and inclusive growth (Annex 6). Denmark ranked top of the European Commission's 2021 Digital Economy and Society Index, but further digitalisation efforts are needed for small companies and public administration (see Annexes 8 and 11). Despite the high overall level of research and development (R&D), the concentration of R&D activities in a small number of large firms could be a sign of insufficient building of capacity for research within small and medium-sized companies (see also Annexes 9 and 10). While there are many start-up companies created in Denmark, these and small innovative companies struggle to scale up and grow (Annex 10). Given the high household debt, further policy measures could be needed to make indebted households more resilient and the introduction of the new property tax system could limit house price increases and ensure fairer taxation (Annexes 16 and 17).

Denmark is making progress on most of the United Nation's Sustainable Development Goals (SDGs), despite some challenges. Denmark performs very well on SDGs overall, ranking among the global top 5. It excels — and has further improved — in terms of environmental sustainability, fairness and macroeconomic stability. As regards productivity, strengthening digital skills remains a challenge. On the preservation of life on land, Denmark has made some progress, but still scores below the EU average (Annex 1) ([1]).

Under the headline '*Denmark can do more 1'* the government has launched a comprehensive medium-term strategy to relaunch the economy after the pandemic. The strategy, which goes beyond economic policy, comprises a wide range of reforms with a focus on innovation, education, green and digital transition and an increase in the workforce as well as foreign and security policy. As an integrated element in this first set of new policy guidelines, the government is putting forward a new digital strategy, of which the first stages are included in the Danish recovery and resilience plan. The strategy, based on recommendations from a high-level expert group, is expected to encompass a wide array of elements, including public sector digitalisation, digital skills for all, cyber security and research(see Box 1).

The "Denmark can do more 2*" strategy presented* in April 2022 focuses on medium-term ambitions in the field of energy independence. Policy intentions include the phasing out of fossil fuel boilers and support for low-income households; additional wind and solar capacity both offshore and onshore; fostering domestic sustainable biogas production capacity so as to cover 100% national gas demand by 2030; new carbon tax combined with the

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[1] Indeed, Denmark shows some vulnerabilities in the green resilience dashboard, particularly in the area of 'ecosystems, biodiversity and sustainable agriculture' (https://ec.europa.eu/info/strategy/strategic-planning/strategic-foresight/2020-strategic-foresight-report/resilience-dashboards_en#heatmap).

EU Emissions Trading System to ensure the Fit for 55 ambition is met by 2030; and boosting exports of green solutions at international level.

Macroeconomic impact of Russia's invasion of Ukraine

Denmark's direct economic exposure to Russia is below the EU average. Denmark's exposure towards Russia in trade and foreign direct investment has decreased substantially since the sanctions and Russian ban on certain products were introduced in 2014 and by now it is well below the EU average. Services trade represents around one third of the total trade with Russia and is mainly related to maritime transport. Accordingly, employment directly and indirectly related to exports to Russia is relatively small. Direct and indirect financial links greatly decreased after the largest Danish bank withdrew from Russia and the Baltic countries in 2016.

Energy dependence on Russia is significant but could fall markedly by next year. Coal accounts for 4.7% of Denmark's energy mix and it is almost wholly dependent on Russian imports. Denmark has a significantly larger share of oil in its energy mix (37.9%), but is much less dependent on Russian imports (12%) ([2]). Lastly, around 13.8% of Denmark's energy mix is made up of natural gas. Although the country does not import Russian gas directly, its dependence through import of gas from Germany is likely to be significant and constitutes an indirect dependence on Russia for natural gas. The refurbishment of one of the largest Danish oil and gas fields is expected to be finished in Q2 2023, which could significantly reduce the import of oil and make Denmark a net gas exporter again. The government also supports short-term measures to accelerate the exit from Russian natural gas and oil by the temporary increase of domestic gas extraction from the North Sea, increased use of sustainable biogas and accelerating the finalisation of the Baltic Pipe (which will transport gas from Norway to the Danish and Polish markets).

Supply side restrictions and price shocks could severely hit certain sectors. Denmark has a relatively significant reliance on Russian imports for iron and steel (around 18% of total supply). Similar to other EU countries, Danish companies are also facing large increases in energy prices. High energy prices could negatively affect companies in the short term. On the other hand they are expected to accelerate investment to sustainable energy solutions and further energy savings. The government decided to give a grant of EUR 792 to approximately 419 000 low-income households in order to compensate for rising energy costs in heating and granted approximately EUR 13.3 million to cover the additional costs faced by municipalities in relation to existing social schemes aimed at pensioners and low-income households in need. In addition, an agreement with district heating companies has been made to spread the price increase over the entire year, instead of only the payments in the winter months.

Denmark expects to receive up to 100 000 Ukrainians fleeing war. On 16 March 2022 Parliament adopted a law giving special refugee status to Ukrainian citizens, implying access to housing, schools and the labour market. The impact on the education, social and health systems is expected to be a significant challenge.

Solid public finances helped withstand the pandemic

Public finances deteriorated due to COVID-19 support measures and the contraction in GDP. The need for

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([2]) Eurostat (2020), share of Russian imports over total imports of natural gas, crude oil and hard coal. For Denmark, total imports include intra-EU trade. Crude oil does not include refined oil products.

emergency measures hit public finances at a time when these were in a sound starting position, as the general government balance was markedly positive in 2019 (to the tune of 4% of GDP), notably due to particularly strong tax revenues. However, the deterioration turned out to be significantly less severe (government balance of -0.2% of GDP in 2020) than in most other Member States, due to extraordinary tax revenue inflows as well as a less extensive take-up of emergency support schemes than initially expected. In the second half of 2021 public finances recovered, fuelled by the return to near-normal economic activity. As a result, the general government balance stood at 2.3% of GDP in 2021. Meanwhile, the debt-to-GDP ratio resumed its downward trend of recent years and fell below 40% of GDP in 2021 (see Annex 18).

Denmark provided far-reaching COVID-19 emergency support to businesses and workers. This large-scale response stabilised the economy, and the choice of emergency measures as well as their timing appears to have been well-judged. Wage support and coverage of businesses' fixed costs during the lockdown periods were the largest types of schemes. Also, state lending was widespread to prevent liquidity squeezes on closed businesses. General emergency measures were phased out last year and current COVID support measures have been made more targeted. A gradual phasing out of support measures should balance the need to allow resource reallocation while containing corporate insolvency for viable firms in highly impacted sectors. In this respect, gradually transitioning to commercial bank lending could ensure efficient capital allocation.

Danish public finances are considered sustainable over the longer term. The expected increases in pension , health and long-term care expenditure due to an ageing population should remain manageable, thanks among other things to already agreed increases in the future pensionable age (linked to increases in life expectancy).

As part of a broad political agreement, the government has also presented a plan for a new defence agreement. As part of the agreement, defence expenditure will be gradually raised from the current 1.2% of GDP to 2% of GDP by 2033. Additionally, 0.15% of GDP will be spent in 2022 and 2023 on defence, diplomacy and humanitarian purposes. To finance the increased spending, a change in the Budget Law will allow a structural deficit of maximum 1% of GDP, up from the current ceiling of 0.5% of GDP.

THE RECOVERY AND RESILIENCE PLAN IS UNDERWAY

The Danish recovery and resilience plan (RRP) was submitted in April 2021. It includes major measures to accelerate the twin green and digital transitions. The formal submission followed a consultation process with social partners and other civil society organisations. The plan includes a total of 34 measures (29 investments and 5 reforms) structured around three components: (i) advancing the green transition; (ii) accelerating and expanding digital reforms and transformation; and (iii) social and research/development. These are all helping to address challenges relevant to all four dimensions of competitive sustainability (see Annex 2).

The Danish RRP promotes environmental sustainability. The share in the Danish RRP dedicated to the green transition is among the highest in the EU. A green tax reform will accelerate the decarbonisation of the economy and is one of the plan's landmark initiatives.. The reform creates tax incentives for companies in 2021-22 to help them frontload green and digital investment. This will also help them prepare for higher energy taxes from 2023 onwards, which over time are to be replaced by a universal CO2 emission tax. The plan's measures to foster the green transition, include action on biodiversity and sustainable agriculture ('green transition of agriculture and environment'). The plan's energy efficiency component ('energy efficiency, green heating and carbon capture and storage (CCS) capacity') is expected to contribute to significant decreases in energy consumption and greenhouse gas emissions. The sustainable road transport component aims to accelerate the decarbonisation of the transport sector. Another component aims to promote R&D projects to accelerate research in various green policy areas: CCS and use of CO2, green fuels, climate-

friendly agriculture and, to a limited extent, the circular economy.

Several RRP measures address digital and productivity related challenges. A new 'Digital Strategy' was adopted to further digitalise the public sector and prepare it for future challenges**.** The National Digital Strategy entails nine 'visions' or sub-reform areas covering both the public and private sector. The digital sub-measures include a strategy to promote the adoption of AI and update the cybersecurity strategy. Funding will be provided to digitalise small and medium-sized enterprises and extend rural broadband coverage. In addition, digital measures in the health component (including expansion of telemedicine use) aim to make the sector more resilient (see Annex 14).

The measures in the plan will contribute to 'Shaping Europe's digital future' ([3]**).** Several measures to support the digital transition for small and medium-sized enterprises have the potential to further improve competitiveness. The investment window combined with targeted support schemes for smaller firms will continue to promote digitalisation in business. The forthcoming digital strategy is expected to address the challenges of the digital transition, namely by investing in the digitalisation of companies and digital skills. As regards innovation, the Danish RRP will fund public-private research partnerships focusing on the low carbon economy, resilience and adaptation to climate change. Focused research projects are included in the field of transport, agriculture and assessing CCS potential. With the help of the RRP and existing tax incentives for

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[3] European Commission 2019-24 priority axis: Shaping Europe's digital future | European Commission (europa.eu)

R&D, investment will foster private green and digital research projects.

The Danish plan includes a distinct social dimension, which contributes to the fairness objective and to the implementation of the European Pillar of Social Rights. The plan is expected to help maintain a high degree of social cohesion through supporting employment across the country and by extending digital services. It therefore underpins Denmark's economic, institutional and social resilience. The measures should strengthen Denmark's capacity to absorb economic and social shocks. Taken together, several components and measures are expected to support social and territorial cohesion and convergence (see also Annex 3). The plan further contains some measures that are expected to help address the country's challenges in the area of gender equality and equal

Denmark is likely to reap substantial benefits from spill-over effects. Lastly, the plan will help address the country-specific recommendations ([4]) issued by the European Commission in the context of the European Semester (see Annex 4). Regarding the health sector, the plan includes measures on digitalisation as well as infrastructure and logistics support for critical medical products, as well as support for COVID-related research.

Box 1:	**Key deliverables under the recovery and resilience plan in 2022-23**

- Launch of the National Digital Strategy

- Implement digital solutions in the health care sector as well as infrastructure and logistics support for critical medical products, and support for COVID-related research

- 3 500 households to gain very high-speed broadband coverage

- Increase the number of scrapped diesel cars, up by 36 000 vehicles

- Select research partnerships for green R&D projects

- Call for tenders for energy efficiency measures in industry

- Complete calls for tender aiming to implement climate technologies and remove carbon-rich soils in agriculture

- Further increase emissions tax on industry and publish an expert report on the introduction of uniform CO_2 emissions taxation.

opportunities for all.

The plan will contribute to macroeconomic resilience and economic growth. It is also in line with the European update of the 2020 new industrial strategy. Economic modelling simulations show that Denmark's value added could increase by between 0.4% and 0.6% by 2024 thanks to the Next Generation EU package, generating up to 8 000 additional jobs. Being a small, open economy,

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([4]) European Commission website: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0504&from=EN

Beyond the challenges addressed by the RRP, as outlined in section 2, Denmark faces additional key challenges not sufficiently covered in the plan, as outlined in the following section. This concerns in particular certain aspects of reducing dependence on fossil fuels, circular economy, labour supply and skills as well as the resilience of the housing market. Addressing these challenges will also help to make further progress in achieving the SDGs related to affordable and clean energy (goal 7), responsible consumption and production (goal 12), decent work and economic growth (goal 8) and industry, innovation and infrastructure (goal 9). In April 2022 the Danish government presented the 'Denmark Can Do More II' Strategy to phase out Russian gas and accelerate the green transition. The new roadmap covers five key elements for weaning households off gas, mostly by switching 400,000 households to district heating and heat pumps, increase production of sustainable biogas, accelerate renovation of North Sea gas fields, quadruple solar and onshore wind before 2030 and introduce a CO_2-tax.

Further reducing energy dependence on fossil fuels

Denmark has traditionally had a low energy supply dependence due to substantial oil- and gas fields in the North Sea and significant investment in renewable energy. Production of domestic oil and gas has decreased and Denmark is, on a temporary basis, a net oil and gas importer until the re-opening of the country's largest oil- and gas field (Tyra) in 2023. The share of renewable energy and sustainable biogas reached 43.6% in the total energy mix in 2020 which is expected to increase to 54% by 2030. Denmark has

also a high biogas' share of 25% in 2021 (out of its overall gas consumption), up from just over 21% in 2020.

Table 3.1: **Energy mix**

	DENMARK		EU	
	2020	**2030**	**2020**	**2030**
Solids	4.7%	0.6%	10.8%	5.8%
Oil	37.9%	33.6%	32.7%	32.1%
Gas	13.8%	11.8%	24.4%	21.5%
Nuclear	0.0%	0.0%	13.1%	12.0%
Renewables and biofuels	43.6%	54.0%	19.0%	28.7%

(1) % of Gross Inland Consumption
(2) The share of renewables includes non-renewable waste
Source: Eurostat (2019/2020 data)

Danish energy dependence on Russia has increased significantly since 2019 due to temporary factors. Oil makes up 37.9% of the total energy mix, with 12% [5] of it as direct Russian import in 2020. Gas makes up 13.8% of the energy mix and is mainly imported via Germany (87% of the total supply), where a significant share of gas is Russian-sourced. While coal accounts for a very small share of the energy mix (4.7%), Denmark is almost completely dependent on Russia (97%) for its imports. The total dependency on Russian energy imports for Denmark is 21.1% (EU average 24.4%). Denmark's oil and gas imports have increased substantially since 2019 due to the closure and ongoing refurbishment of one of the largest oil- and gas fields (Tyra) in the

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[5] Eurostat (2020), share of Russian imports over total imports of natural gas, crude oil and hard coal. For the EU27 average, the total imports are based on extra-EU27 imports. For Denmark, total imports include intra-EU trade. Crude oil does not include refined oil products. Denmark has an indirect dependency on Russian imports through intra-EU trade. Accounting for the secondary dependence on Russian gas through intra-EU imports would lead to the estimation that Denmark has a 65% Russian import dependency on gas / 98% on coal.

North Sea. Once this investment is finished in Q2 2023, Danish oil imports should decrease significantly, possibly eliminating Russian imports and make Denmark a net exporter of gas again. The government also supports exploring short-term measures to accelerate the exit from Russian natural gas and oil by a temporary increase in domestic gas extraction from the existing fields in the North Sea, and increased use of sustainable biogas.

Due to Denmark's ambitious climate objectives, several measures (including those financed by the RRP) are already being implemented top reduce fossil energy dependence but overall ambition could be increased. Denmark's climate policy objectives aim to reduce greenhouse gas emissions by 70% by 2030, compared to 1990, and achieve climate neutrality by 2050 at the latest, including a commitment to a full coal phase-out by 2028. Denmark's National Energy and Climate Plan (NECP) estimated additional investments needs between EUR 4-12 billion until 2030 in energy efficiency measures to meet this target. The Danish RRP's green tax reform provides a general tax incentive for companies to frontload their energy saving investment. Sustainable transport and mobility-related measures are also helping to reduce the dependence on fossil fuels. Energy efficiency investment in private and public buildings as well as for companies, replacing oil and gas burners will further reduce oil and gas dependence. Nevertheless, Denmark indicated a low contribution to the EU energy efficiency 2030 targets in its NECP, hence overall ambitions could be further increased.

Denmark is strongly committed to increasing renewable energy capacity in the form of offshore wind capacity. The Danish NECP estimates investment needs of EUR 8-12 billion in renewable electricity generation until 2030 to achieve the climate objectives. The country currently has 2,3 GW of offshore wind installed and has taken steps to add a further 6,15-6,55 GW of offshore wind capacity towards 2030. In June 2020, the Danish Parliament (Folketing) decided to begin preparations for the construction of two energy islands in

Denmark – an artificial North Sea energy island and another one on the natural land mass of Bornholm in the Baltic Sea. The energy island on Bornholm is currently planned to have a capacity of 2 GW, while the plan for the energy island in the North Sea will have an envisaged capacity of 3 GW in 2033, rising to 10 GW as soon as possible, with 2040 as a target date, subject to the realisation of necessary grid interconnections. A Commission study (^{6}) has identified numerous moderate and minor barriers in Denmark that tend to disrupt the often already lengthy and complex permitting and administrative procedures for deploying renewable energy installations, in particular for onshore and offshore wind as well as larger rooftop solar PV plants. In particular, these projects face a growing reluctance from responsible authorities in the planning and preparation processes and complaints from third-parties.

The increasing share of renewables and the expected large increase in energy consumption will require significant upgrades in energy transmission networks. As also highlighted in the Danish National Energy and Climate Plan further investment in the electricity grid is necessary to ensure that the increasing share of renewable energy can be integrated in the electricity system. An efficient electricity network, including expansion and upgrading of the Danish transmission grids and interconnections with neighbouring countries, is a precondition for the continued development of efficient and competitive renewable energy production and distribution.

Further increasing cross-country interconnection would help to achieve decarbonisation, energy efficiency, and security of supply. Denmark's geographical location is particularly promising for energy links Denmark's electricity grid. It is already well interconnected with other countries. Speeding up ongoing interconnection

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(^{6}) European Commission: Technical support for RES policy development and implementation, forthcoming.

projects can also foster diversification of energy supply Denmark's potential could be developed even further, in order to increase security of supply and adaptability to regional variances.

Strengthening the circular economy to support the green transition

Denmark is pursuing ambitious climate objectives and the Danish RRP has a strong focus on the green transition, earmarking 60% of the funds for green initiatives. The country has set a target to reduce greenhouse gas emissions by 70% by 2030 (relative to 1990 levels) and wants to achieve climate neutrality by 2050 at the latest. In 2020, Denmark's total greenhouse gas emissions were 42% below 1990 levels ([7]). Most of this reduction has come through a shift from fossil fuels to renewable energy. Currently, construction, transport and agriculture are the largest greenhouse gas-emitting sectors outside the EU Emissions Trading System. Denmark has put in place comprehensive policies and measures to further reduce greenhouse gas emissions in these sectors, which will be partially supported by the Danish RRP (see Annex 5).

Nevertheless, challenges remain in reaching Denmark's ambitious climate goals. Additional investment, in particular in research, technology and infrastructure, is likely to be needed. Further action is also warranted in other key sectors and areas such as the circular economy and waste management, and by enhancing carbon sinks in agriculture and water/fisheries management. In taking climate policy forward, attention needs to be paid to regions most affected by the transition due to high concentration of oil and gas industry in South Denmark and North Jutland (See Annex 15). In Denmark, energy poverty overall stands at 3% (EU: 8.2%), with approximately 10% of the two lowest-income deciles in the population being

unable to keep their homes adequately warm (see Annex 6).

Denmark is under-performing with respect to certain aspects of the circular economy. Danish rates of circular material use are well below the EU average. Graph 3.1 even shows a small decline in secondary material use over the past years. Denmark would thus benefit from investment to boost the circular economy, including through waste prevention and better waste management, as well as improved resource efficiency and secondary material usage (see Annex 7).

Graph 3.1: **Circular material use rate, 2010-2020**
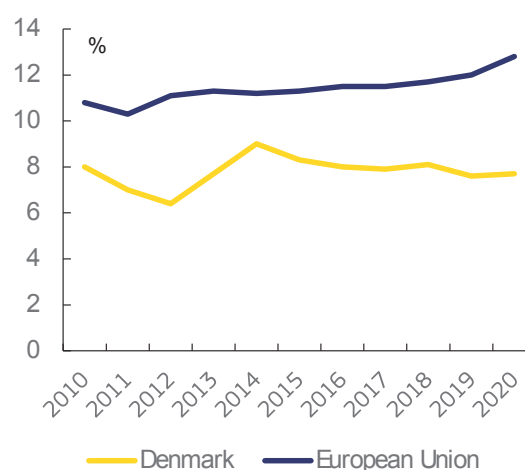
Source: Eurostat

Denmark would benefit from an improved municipal waste management system. It currently produces the highest amount of municipal waste[1] per capita in the EU, with 845 kg/capita/year. After a downward trend until 2017, municipal waste generation in Denmark has started to increase in recent years (see Graph 3.2). Further efforts to prevent or recycle waste can contribute to achieving Denmark's ambitious climate objectives. While Denmark's landfill rate is below 1%, it incinerated 45.2% of its municipal waste, close to double the EU average rate. In kg/capita/year terms incineration exceeds recycling by roughly 20% and despite energy recovery it implies missed opportunities for the circular economy (see also Annex7).

Graph 3.2: **Municipal waste by treatment in Denmark, 2011-2020**
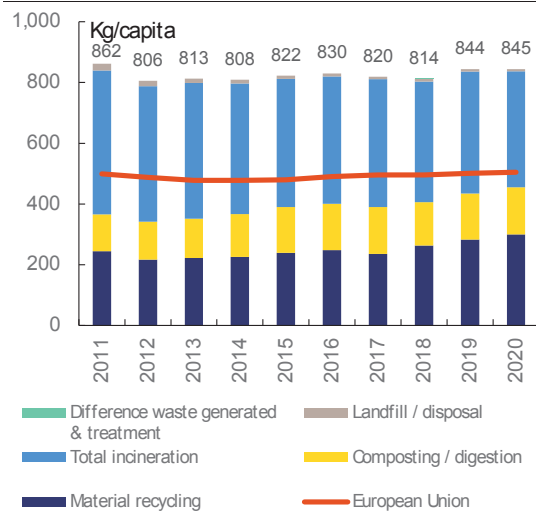
Source: Eurostat

Existing national programmes and plans for waste and the circular economy need to be implemented. Preventing products and materials from needlessly becoming waste for as long as possible is the most efficient way to improve resource efficiency and reduce the environmental impact of waste. Waste prevention and re-use are the preferred options at the top of the waste hierarchy in terms of achieving circularity. Already in 2019 ([8]), Denmark received two recommendations for priority action in the field of waste: (i) introducing of new policy instruments to promote waste prevention, and (ii) increasing the country's recycling share and shifting away from incineration to greener sources of heating generation. While less waste would imply lower energy generation, this could over time be replaced by other environmentally-friendly methods.

Training the labour force for the green and digital transition

Denmark saw strong employment growth after gradually reopening its economy. After receding in early 2020 due to the COVID-19 pandemic, employment

surpassed its pre-pandemic level in the second half of 2021. The COVID-19 outbreak induced a drop in economic activity, although its adverse effects on the labour market were to some extent cushioned by a short-time work scheme. From 2019 to 2020, the employment rate for people aged 20-64 in Denmark decreased, albeit less than in most Member States. Both the employment and unemployment rate in Denmark improved considerably during 2021.

Graph 3.3: **Real unit labour cost, real compensation per employee and real productivity**
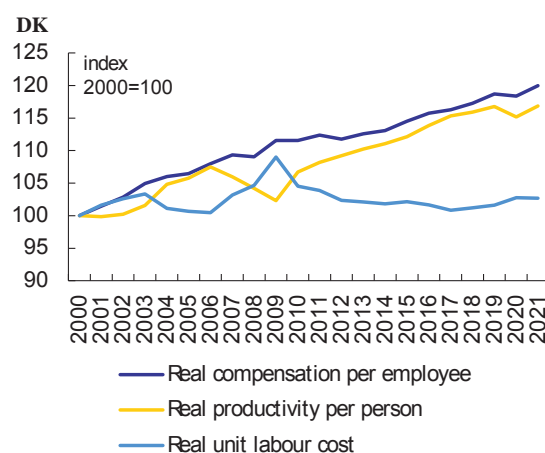
Source: Eurostat

Labour shortages are significant across all sectors, with gaps being historically large in the construction and services sectors. For the construction sector, the share of firms reporting labour shortages was at 43% in April 2022, while services industries reached a new record of 37% in the same month. Wages are on the rise, partly in response to the tight labour market. In the fourth quarter of 2021, nominal compensation per employee increased by 2.3%, which is the largest increase observed since 2010. Meanwhile, real compensation per employee decreased marginally (Graph 3.4). Labour shortages in greening sectors such as professional, scientific and technical activities have also been identified (see Annex 6).

Upskilling and reskilling could be key to perpetuating the current economic expansion. There is still a sizeable reserve

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([8]) 2019 European Commission: Environmental Implementation Review

of people able to join the labour market and fill vacancies in a range of sectors, provided the right training offers, notably vocational training, are available and sufficiently used. Denmark has increased public expenditure in this area with additional funding for upskilling measures to be implemented during 2020-22. Individuals' digital skills are high, with 69% in 2021 possessing at least basic digital skills, according to the Digital Economy and Society Index. The Digital Scoreboard (2020) shows that 20.4% of ICT specialists are women, above the EU average. By further strengthening participation in adult learning, Denmark would contribute to reaching the 2030 EU headline target on skills.

Denmark is one of the Member States with the highest level of digital skills, yet further improvements would facilitate keeping pace with the digital transition. The country ranks first in digital performance at EU level, scoring well above the EU average in basic and above basic digital skills. An above-average percentage of people possess at least basic digital skills. Technological change and digitalisation are making jobs increasingly skills-intense – both in terms of level and types of skills. Therefore, despite the overall positive relative performance, it is important to further improve the digital skills (see also Annex 8).

Attracting foreign students remains a challenge. The introduction of additional work visa categories has helped reduce labour shortages. However, it might not fully compensate lost hiring opportunities entailed by the decrease in foreign students following the curtailment of higher education programmes for English-speaking students.

Graph 3.4: **Participation, unemployment and NEET rates**
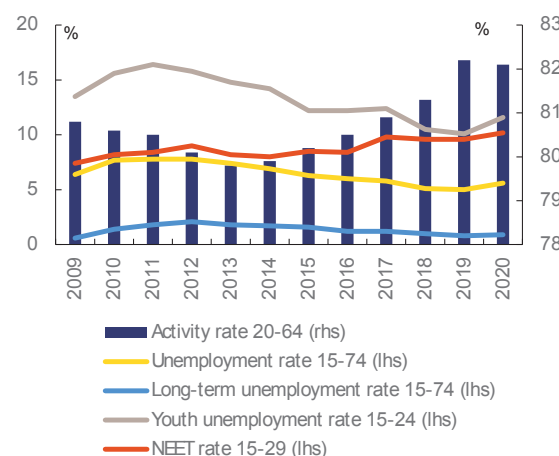
(1) NEET: not in education, employment or training.
Source: Eurostat

Some labour market trends pose challenges for Denmark in the quest for a skilled workforce. Denmark performs strongly in adult learning, but enrolment rates are falling. While above the EU average (10.8%), the rate of adult participation in learning has declined over recent years . A relatively large share of young adults (17% in 2018) do not finish high school or have no vocational qualification. At the same time, the share of early leavers from education and training has decreased, albeit remaining above the 2015 low (see Annex 13). According to PISA 2018 data, pupils with a migrant background continue to show considerably worse basic reading skills (twice the EU average). Denmark intends to address these challenges as part of its efforts to have an adequately skilled workforce, in line with the European Pillar of Social Rights.

Denmark's ambitious climate objectives will require re-skilling and upskilling in several sectors. To ensure a fair transition the work force in several sectors (such as industry, energy, transport and agriculture) will need to adapt to significant technological changes (see Annex 6). Further investment in skills would help the transition and preserve the competitiveness of these sectors. The high level of digitalisation in the country, both at public and private level, can further the green

transition in the Danish economy, including in the utility sectors.

Improving the resilience of the housing market

Danish households have long carried one of the highest mortgage debt burdens in the EU. Several factors contribute to Danish households' high debts, including a unique mortgage financing system providing very low interest rates, sizeable pension savings, taxation policy as well as idiosyncratic features of the mortgage market. Mortgage owners can benefit from interest-only, deferred amortisation types of loans (similarly for instance to Sweden and the Netherlands), thereby significantly expanding their loan-taking capacities. The Danish tax system also allows one of the highest tax deductions for mortgage interest payments in the EU, which incentivises debt financing of residential property (Annex 17). As a result, Danish households (together with Swedish and Dutch households) have one of the highest levels of mortgage debts in the EU compared to GDP or household incomes.

Following years of moderate growth, increased demand for residential property during the pandemic led to a new spike in house prices. The demand for residential properties more than doubled in 2021 and house price growth accelerated from 4.5% in 2020 to 13.4% in the first half of 2021 in annual terms. Elevated demand has eased since the second half of 2021, returning to the pre-pandemic average, and accordingly the house price increase has gradually slowed to around 4.1% by the end of 2021, but started to increase again in early 2022. The house price increase has been particularly steep in the Copenhagen area compared to the rest of Denmark (see Graph 3.5).

Index, 2000=100

Denmark — Copenhagen
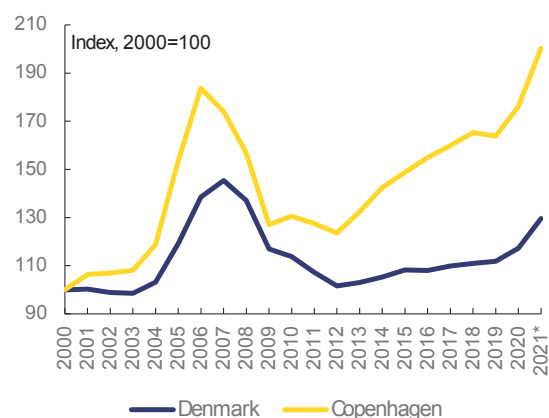
Source: Statistics Denmark

The new property taxation system would increase housing market resilience and fairness. Recurrent property taxes are currently capped, hence they do not increase with market prices and so are not able to dampen house price cycles. The current system also raises fairness questions, as effective property tax rates can be currently lower in the main urban cities where owners have benefitted from the highest housing price increase. The introduction of the new property tax system was already approved by Parliament in May 2017 ([9]) but is still not in place. The implementation of the new system would restore the link between market prices and taxes, smoothen house price cycles and ensure a fairer property taxation system ([10]). Reducing high mortgage interest deductibility would lower households' incentives to take on debt, while using this saving to increase the personal income tax allowance could increase welfare and economic equality ([11]).

Residential construction has kept pace with rising demand, but high demand poses challenges for affordable housing in urban areas. Investment in dwellings

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[9] The government announced the introduction of the new tax system from 2024, following several delays.

[10] See for instance Danmarks Nationalbank (2017): Housing Taxation Agreement Stabilises House Prices.

[11] European Commission, Country Report Denmark 2020, Commission Staff Working Document.

surged during the pandemic, growing at around 9-10% both in 2020 and 2021 also due to energy renovation in the social housing stock. However, high prices for owner occupied housing and long waiting times for social housing in the main urban areas increased the need for additional supply of affordable housing units. As a response the Danish government has put in place a range of new initiatives to further increase construction of affordable rental housing, primarily social housing. A total budget of EUR 1.35 billion has been appropriated to support the initiatives, of which EUR 0.67 billion are to be implemented until 2031. The initiative aims to construct 22,000 new affordable rental homes (1.6% of the total stock), including 4,000 student accommodations (10% of the total stock), in the four largest cities of Copenhagen, Aarhus, Odense and Aalborg by 2035. Amongst the new initiatives is an initiative with a budget of EUR 0.12 billion which enables social housing organisations to buy private rental housing and convert it into social housing.

Although mortgage lending growth remained modest, some Danish households remain vulnerable to an interest rate hike, or major house price adjustment. The share of loans from new mortgages with a debt-to-income (DTI) ratio above 4 and loan-to-value (LTV) ratio above 60% has increased in the Copenhagen area, but mya be showing first signs of declining again (see Graph 3.6). To avoid further building up of risk, the resilience of such loan takers could be strengthened by opting for fixed interest rates and increasing the amortisation requirement ([12]) to prevent rises in debt service costs, especially during economic downturns.

Graph 3.6: **Share of loans from new mortgages with debt-to-income above 4 and loan-to-value above 60%**
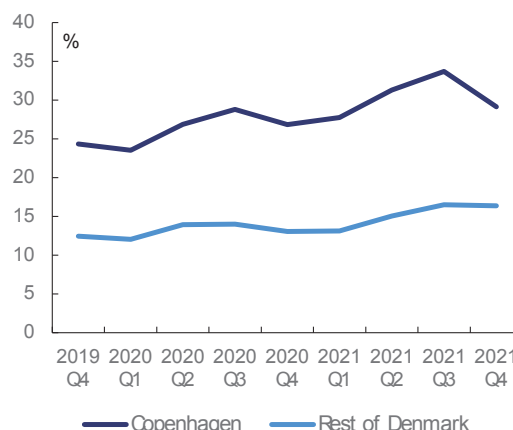
Source: Nationalbanken

KEY FINDINGS

Denmark's recovery and resilience plan includes measures to address a series of its structural challenges through:

- **Accelerating the green transition** by supporting the implementation of a green tax reform, fostering investment in the energy efficiency of public and private buildings, funding measures to reduce greenhouse gas emissions in transport, agriculture and other sectors;

- Accelerating the digital transition by adopting a new digital strategy, modernising public administration, helping small and medium-sized firms invest in digital technology and extending rural broadband coverage;

- Promoting R&D investment and involving more companies in research activities, as well as supporting green research and development projects;

- Increasing the resilience of the healthcare system, including digitalising healthcare, infrastructure and logistics support for critical medical products, and support for COVID-related research.

Beyond the reforms and investments in the RRP, Denmark would benefit from:

- Reducing dependence on fossil fuels and further decarbonising the economy by accelerating the deployment of renewable energies by streamlining and accelerating permitting procedures, upgrading energy transmission networks and increasing interconnections with neighbouring countries, while improving energy efficiency to reduce energy consumption.

- Making further progress with respect to the circular economy and waste management, in particular on prevention, recycling and reducing incineration of (municipal) waste.

- Supporting digitisation of small and medium-sized firms and public administration to improve productivity and competitiveness as well as boost the transition toward a greener Danish economy (for instance by increased digitalisation of utility services).

- Securing an adequate labour supply as well as investing in re- and upskilling the labour force and increasing vocational training participation to promote the green and digital transitions.

- Introducing the delayed new property tax system to ensure fairer property taxation and mitigate house price increases, address shortages of affordable housing in urban areas through new construction and increase financial resilience of highly indebted borrowers by further limiting the reliance on variable interest rates and deferred amortisation mortgage loans.

ANNEXES

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This annex assesses Denmark's progress towards the Sustainable Development Goals (SDGs) along the four dimensions of competitive sustainability. The 17 SDGs and their related indicators provide a policy framework under the UN's 2030 Agenda for Sustainable Development. The aim is to end all forms of poverty, fighting inequalities and tackling climate change, while ensuring that no one is left behind. The EU and its Member States are committed to this historic global framework agreement and to playing an active role in maximising progress towards the SDGs. The graph below is based on the EU SDG indicator set which was developed to monitor progress towards SDGs in an EU context.

While Denmark performs very well on several SDG indicators related to *environmental sustainability* (SDG 7, 9, 11, 12, 13), compared to the EU average, it still needs to catch up on others (SDG 14 and 15). Notably, 'Net greenhouse gas emissions per capita (as estimated by Eurostat)' improved from 9.8 t CO2e/capita in 2014 to 8.6 t CO2e/capita in 2019 but ranges above the EU average (7.8 t CO2e/capita). In addressing 'Affordable and clean energy' (SDG 7), Denmark has achieved further progress in regard to the share of renewable energy in total energy consumption, which increased from 30.5% in 2015 to 31.6% in 2020, significantly over-performing the EU average in this indicator (22.1% in 2020). Measures included in the energy and green R&D components of the RRP aim to further increase innovation in the energy performance field. The Danish government assessed that there is still progress to make on several goals, including on SDG 12 ([13]). Generation of municipal waste has increased from 814 to 845 kg per person between 2018 and 2020, while the circular material use rate decreased from 8.3% to 7.7% between 2016 and 2020.

**Denmark performs well on most SDG indicators related to *fairness (SDG 1, 2, 3, 4, 5, 8, 10).* Denmark outperforms the EU average in most indicators related to gender equality, poverty, inclusive growth and inequality (SDGs 1, 5, 8, 10), which can be attributed to its social benefits system. Denmark improved on various related indicators like 'Positions held by women in senior management' (27.1% in 2016, 34.9% in 2021), 'Employment rate' (76% in 2016, 79% in 2021) or 'People at risk of poverty or social exclusion' (18.6% in 2015, 16.8% in 2020).

While Denmark performs very well on some SDG indicators related to *productivity (SDG 8, 9),* it still needs to catch up on others (SDG 4). In Denmark, the share of households with high-speed internet connections in 2021 (94.9%) is well above the EU average (70.2%) and represents significant progress on this indicator since 2015 (58.1% in 2016, EU: 25.2%). Denmark has one of the highest gross domestic expenditure on R&D (3.03% of GDP in 2020) despite a small decrease since 2015 (3.06% of GDP). As regards quality of education (SDG 4), while Denmark outperforms EU average, several indicators have shown negative trends, such as early leavers from education (7.5% in 2017 to 9.8% in 2021) and the share of underachieving pupils in science (15.9% in 2015 to 18.7% in 2018). For this reason, the RRP includes a large share of investments in the digital component with measures to further tackle remaining digitalisation challenges, notably by promoting further digitalisation measures across the economy and society.

**Denmark performs very well on SDG indicators related to *macroeconomic stability (8, 16).* Denmark performs very well, and further improved, on the quality of its institutions, including trust in institutions (SDG 16). The percentage of the population in Denmark with confidence in the EU Parliament increased from 51% in 2016 to 67% in 2021 (EU: 50% in 2021). Denmark also outperforms the EU average on indicators related to 'Decent work and economic growth' (SDG 8). Real GDP per capita in Denmark increased from EUR 45 720 in 2016 to EUR 50 200 in 2021 (EU: 27 810 in 2021).

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[13] See "Voluntary National Review 2021: Progress on Sustainable Development Goals 2017-2021" https://fm.dk/udgivelser/2021/juni/voluntary-national-review-denmark/

Graph A1.1: **Progress towards SDGs in Denmark in the last five years**

Status rel. EU (y-axis) vs Progress score (x-axis)

Top-left quadrant (yellow): Denmark is moving away from these SDGs but status is better than EU
Top-right quadrant (green): Denmark is progressing towards these SDGs and status is better than EU
Bottom-left quadrant (red): Denmark is moving away from these SDGs and status is worse than EU
Bottom-right quadrant (yellow): Denmark is progressing towards these SDGs but status is worse than

SDG positions: SDG 4, SDG 2, SDG 17, SDG 8, SDG 16, SDG 9, SDG 5, SDG 3, SDG 11, SDG 10, SDG 1, SDG 12, SDG 7, SDG 13, SDG 15

Legend:
1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice and strong institutions
17. Partnership for the goals

For detailed datasets on the various SDGs see the annual ESTAT report 'Sustainable development in the European Union', https://ec.europa.eu/eurostat/product?code=KS-09-22-019; Extensive country specific data on the short-term progress of Member States can be found here: Key findings - Sustainable development indicators - Eurostat (europa.eu). *Source:* Eurostat, latest update of 28 April 2022. Data mainly refer to 2015-2020 and 2016-2021.

The Recovery and Resilience Facility (RRF) is the centrepiece of the EU's efforts to support its recovery from the COVID-19 pandemic, fast forward the twin transition and strengthen resilience against future shocks. Denmark submitted its recovery and resilience plan (RRP) on 30 April 2021. The Commission's positive assessment on 17 June 2021 and the Council's approval on 13 July 2021 paved the way for disbursing EUR 1.551 million in grants under the RRF in 2021-26. The financing agreement was signed on 27 August 2021. The key elements of the Danish RRP are set out in Table A2.1.

The share of funds contributing to each of the RRF's six policy pillars is outlined in Graph A2.1 below.

The progress made by Denmark in implementing its plan is published in the Recovery and Resilience Scoreboard. The Scoreboard also gives a clear of the progress made in implementing of the RRF as a whole.

Table A2.1: **Key elements of the Danish RRP**

Total allocation	EUR 1,551 million in grants (0.5% of 2019 GDP)
Investments and Reforms	29 investments and 5 reforms
Total number of Milestones and Targets	77
Estimated macroeconomic impact (1)	Raise GDP by 0.4%-0.6% by 2026 (0.5% in spillover effects)
Pre-financing disbursed	EUR 201 million
First instalment	Denmark did not yet submit a first payment request

(1) See Pfeiffer P., Varga J. and in 't Veld J. (2021), "Quantifying Spillovers of NGEU investment", European Economy Discussion Papers, No. 144 and Afman et al. (2021), "An overview of the economics of the Recovery and Resilience Facility", Quarterly Report on the Euro Area (QREA), Vol. 20, No. 3 pp. 7-16.
Source: European Commission

Graph A2.1: **Share of RRF funds contributing to each policy pillar**
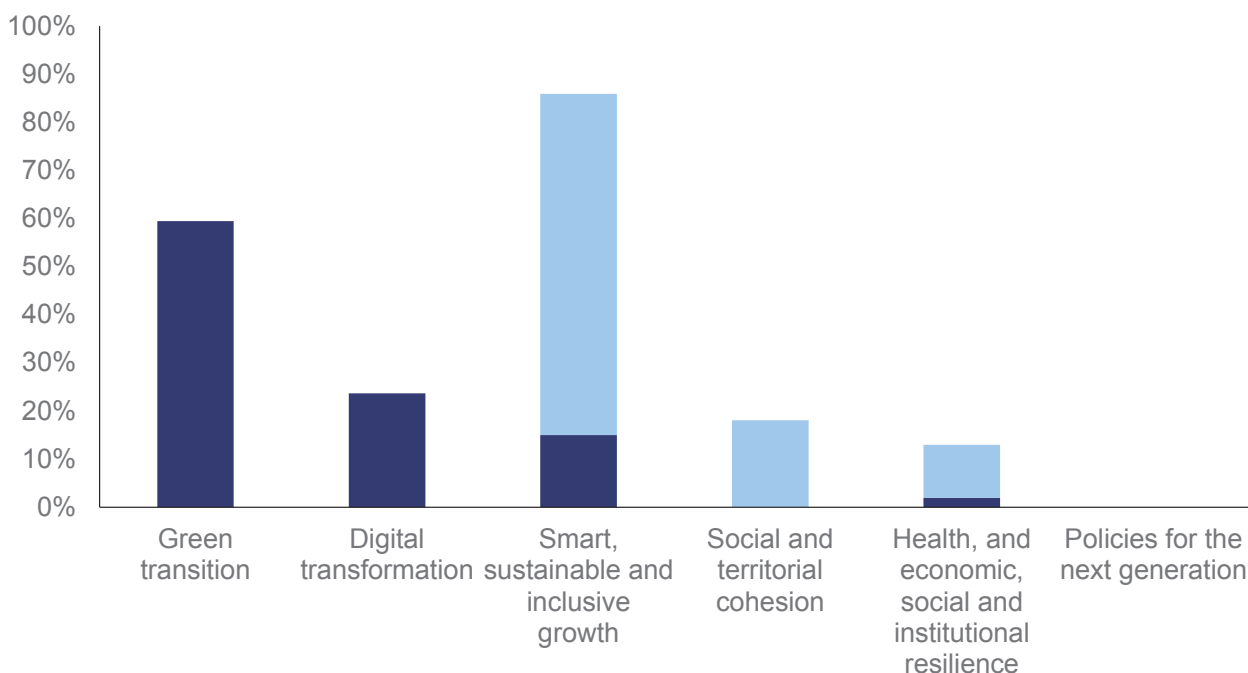
(1) Each measure contributes towards two policy areas of the six pillars, therefore the total contribution to all pillars displayed on this chart amounts to 200% of the estimated cost of the Danish RRP. The bottom part represents the amount of the primary pillar, the top part the amount of the secondary pillar.
Source: RRF Scoreboard https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/country_overview.html

The EU's budget of more than EUR 1.2 trillion for 2021-2027 is the investment lever to help implement EU priorities. Underpinned by an additional amount of about EUR 800 billion through NextGenerationEU and its largest instrument, the Recovery and Resilience Facility, it represents significant firepower to support the recovery and sustainable growth.

In 2021-27, EU cohesion policy funds ([14]) will support long-term development objectives in Denmark by investing EUR 0.61 billion ([15]) including EUR 89.0 million from the Just Transition Fund to alleviate the socio-economic impacts of the green transition in the most vulnerable regions. The 2021-27 cohesion policy funds Partnership agreements and programmes are designed taking into account the 2019-20 country-specific reports and investment guidance provided as part of the European Semester, ensuring this money fully complements other EU funding. In addition, Denmark will benefit from EUR 4.8 billion support for the 2023-27 period from the Common Agricultural Policy, which supports social, environmental, and economic sustainability and innovation in agriculture and rural areas, contributing to the European Green Deal, and ensuring long-term food security.

In 2014-20, the European Structural and Investment Funds (ESIF) for Denmark are set to invest EUR 1.96 billion ([16]) from the EU budget. The total investment including national financing amounts to EUR 2.75 billion (Graph A3.1), representing around 0.14% of GDP for 2014-20 and 3.97% of public investment ([17]). By 31 December 2021, 93% of the total was allocated to specific projects and

50% was reported as spent, leaving EUR 1.39 billion to be spent by the end of 2023 ([18]). Among the 11 objectives the most relevant ones for cohesion policy funding in Denmark are those of sustainable and quality employment, research and innovation, education and vocational training and competitiveness of SMEs (in total EUR 0.6 billion). By the end of 2020, Cohesion policy investments helped improve skills and job opportunities for almost 80 000 persons of which 5500 gained qualifications; supported almost 14 000 SMEs; created over 700 new products, and led to over 20 000 tonnes of reduction in CO_2eq.

Graph A3.1: **2014-20 European Structural and Investment Funds, - total budget by fund**
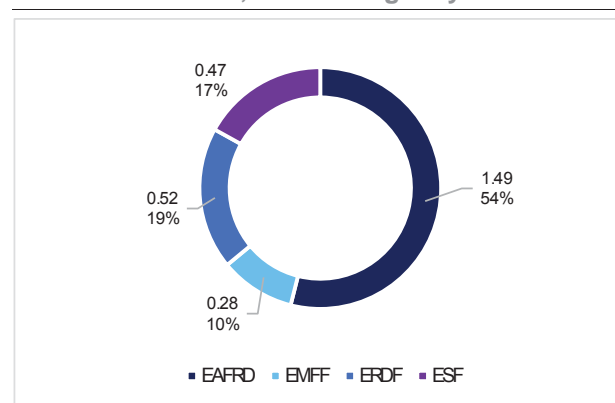
(1) EUR billion, %
(2) The data for the EAFRD and REACT-EU refer to the period 2014-2022
Source: European Commission

Cohesion policy funds are already substantially contributing to the Sustainable Development Goals (SDGs) objectives. In Denmark, cohesion policy funds are supporting 5 of the 17 SDGs with up to 93% of the expenditure contributing to the attainment of the goals.

REACT-EU under NextGenerationEU provided EUR 181.0 million of additional funding to 2014-2020 Cohesion policy allocations for Denmark to ensure a balanced recovery, foster convergence and provide vital support for regions following the impact of the coronavirus outbreak. REACT-EU support in Denmark focuses on the green and digital transition of the economy, notably helping companies develop and adapt to the transitions, and train their workforce.

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[14] European Regional Development Fund (ERDF), European Social Fund+ (ESF+), Cohesion Fund (CF), Just Transition Fund (JTF), Interreg.

[15] Current prices, source: Cohesion Open Data

[16] ESIF includes cohesion policy funds (ERDF, ESF+, CF, Interreg) and European Agricultural Fund for Rural Development (EAFRD) and European Maritime and Fisheries Fund (EMFF). According to the 'N+3 rule', the funds committed for the years 2014-2020 must be spent by 2023 at latest (by 2025 for EAFRD). Data source: Cohesion Open data, cut-off date 31.12.2021 for ERDF, ESF+, CF, Interreg; cut-off date 31.12.2020 for EAFRD and EMFF.

[17] Public investment is gross fixed capital formation plus capital transfers, general government.

[18] Including REACT-EU. ESIF data on https://cohesiondata.ec.europa.eu/countries/DK

Bar chart showing cohesion policy contribution to the SDGs:
- SDG 8 Decent work and economic growth: 0.46
- SDG 4 Quality education: 0.13
- SDG 7 Affordable and clean energy: 0.09
- SDG 1 No poverty: 0.08
- SDG 9 Industry, innovation, infrastructure: 0.02
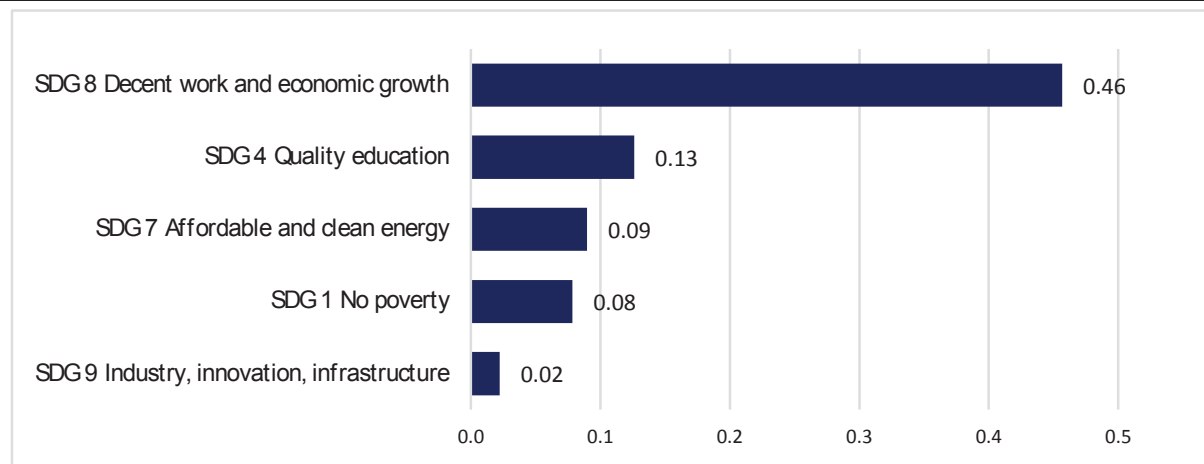
(1) EUR billion
Source: European Commission

In 2022, new projects using the Commission's **Technical Support Instrument** will start to (i) support the green and circular economy transition through standardisation of product data in digital and automated processes and (ii) develop a methodology for reviewing existing legislation for digital-readiness.

Denmark also benefits from other EU programmes. These include the Connecting Europe Facility, which allocated EU funding of EUR 867.3 million to specific projects on strategic transport networks, and Horizon 2020, which allocated EU funding of EUR 1,760.0 million.

The Commission assessed the 2019-2021 country-specific recommendations (CSRs) ([19]) addressed to Denmark in the context of the European Semester. The assessment takes into account the policy action taken by Denmark to date ([20]), as well as the commitments in the recovery and resilience plan (RRP) ([21]). At this early stage of the RRP implementation, overall 92% of the CSRs focusing on structural issues in 2019 and 2020 have recorded at least "some progress", while 8% recorded "limited" (see Graph A4.1). Considerable additional progress in addressing structural CSRs is expected in the years to come with the further implementation of the RRP.

Graph A4.1: **Denmark's progress on the 2019-2020 CSRs (2022 European Semester cycle)**
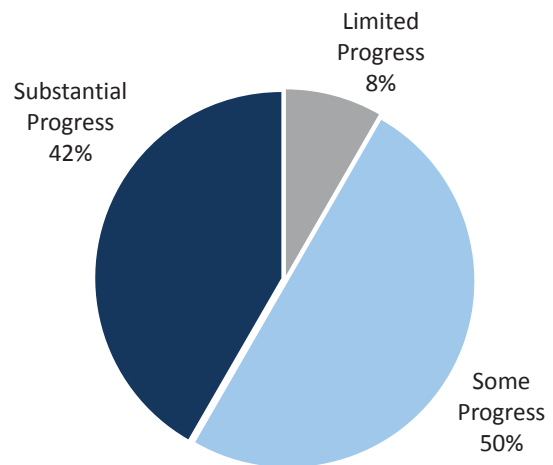
Source: European Commission

([19]) 2021 CSRs: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021H0729%2804%29&qid=1627675454457

2020 CSRs https://eur-lex.europa.eu/search.html?textScope0=ti&lang=en&scope=EURLEX&qid=1526385017799&type=quick&AU_CODED=CONSIL&DD_YEAR=2020&andText0=recommendation&DD_MONTH=07

2019 CSRs https://eur-lex.europa.eu/search.html?textScope0=ti&lang=en&scope=EURLEX&qid=1526385017799&type=quick&AU_CODED=CONSIL&DD_YEAR=2019&andText0=recommendation&DD_MONTH=07

([20]) Incl. policy action reported in the National Reform Programme, as well as in the RRF reporting (bi-annual reporting on the progress with implementation of milestones and targets and resulting from the payment request assessment).

([21]) Member States were asked to effectively address all or a significant subset of the relevant country-specific recommendations issued by the Council in 2019 and 2020 in their RRPs. The CSR assessment presented here takes into account the degree of implementation of the measures included in the RRP and of those done outside of the RRP at the time of assessment. Measures foreseen in the annex of the adopted Council Implementing Decision on the approval of the assessment of the RRP which are not yet adopted nor implemented but considered as credibly announced, in line with the CSR assessment methodology, warrant "limited progress". Once implemented, these measures can lead to "some/substantial progress" or "full implementation", depending on their relevance.

Table A4.1:**Summary table in 2019, 2020 and 2021 CSRs**

Denmark	Assessment in May 2022*	RRP coverage of CSRs until 2026
2019 CSR1	**Some Progress**	
Focus investment-related economic policy on education and skills,	Some Progress	
research and innovation to broaden the innovation base to include more companies,	Limited Progress	Relevant RRP measures planned as of 2021, 2022
and on sustainable transport to tackle road congestion.	Some Progress	Relevant RRP measures planned as of 2021, 2022, 2024
2019 CSR 2	**Some progress**	
Ensure effective supervision and the enforcement of the anti-money laundering framework	Some Progress	
2020 CSR1	**Substantial Progress**	
Take all necessary measures, in line with the general escape clause of the Stability and Growth Pact, to effectively address the COVID-19 pandemic, sustain the economy and support the ensuing recovery. When economic conditions allow, pursue fiscal policies aimed at achieving prudent medium-term fiscal positions and ensuring debt sustainability, while enhancing investment.	Not relevant anymore	Not applicable
Enhance the resilience of the health system, including by ensuring sufficient critical medical products and addressing the shortage of health workers.	Substantial Progress	Relevant RRP measures planned as of 2021
2020 CSR2	**Substantial Progress**	
Front-load mature public investment projects and	Substantial Progress	Relevant measures planned as of 2021, 2022
promote private investment to foster the economic recovery.	Substantial Progress	Relevant RRP measures planned as of 2021, 2022, 2023
Focus investment on the green and digital transition, in particular on clean and efficient production and use of energy,	Some Progress	Relevant RRP measures planned as of 2021, 2025
sustainable transport	Substantial Progress	Relevant RRP measures planned as of 2021, 2022, 2024
as well as research and innovation.	Substantial Progress	Relevant RRP measures planned as of 2021, 2025
Support an integrated innovation strategy with a broader investment base.	Some Progress	Relevant RRP measures planned as of 2021, 2022
2020 CSR 3	**Some progress**	
Improve the effectiveness of anti-money laundering supervision and effectively enforce the anti-money laundering framework.	Some Progress	
2021 CSR1	**Substantial Progress**	
In 2022, maintain a supportive fiscal stance, including the impulse provided by the Recovery and Resilience Facility, and preserve nationally financed investment.	Some Progress	Not applicable
When economic conditions allow, pursue a fiscal policy aimed at achieving prudent medium-term fiscal positions and ensuring fiscal sustainability in the medium term.	Full Implementation	Not applicable
At the same time, enhance investment to boost growth potential. Pay particular attention to the composition of public finances, both on the revenue and expenditure sides of the budget, and to the quality of budgetary measures, to ensure a sustainable and inclusive recovery. Prioritise sustainable and growth-enhancing investment, notably supporting the green and digital transition.	Full Implementation	Not applicable
Give priority to fiscal structural reforms that will help provide financing for public policy priorities and contribute to the long-term sustainability of public finances, including by strengthening the coverage, adequacy, and sustainability of health and social protection systems for all.	Full Implementation	Not applicable

* See footnote 21
Source: European Commission

The European Green Deal aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. This annex offers a snapshot of the most significant and economically relevant developments in Denmark in the respective building blocks of the European Green Deal. It should be viewed together with Annex 6 on the employment and social impact of the green transition and Annex 7 for circular economy aspects of the Green Deal.

Denmark is not yet in a position to meet European and domestic greenhouse gas emission reduction targets. In 2020 its total greenhouse gas emissions were 42% below 1990 levels ([22]). To meet its domestic reduction target of 70% by 2030 (relative to 1990 levels) and achieve climate neutrality by 2050 it will be necessary to significantly step-up investments and reforms across the Danish economy. In sectors covered by the EU Effort Sharing Regulation (ESR) – including buildings, road transport, agriculture, waste and small industry – greenhouse gas emissions fell by over 25% between 2005 and 2020, overshooting Denmark's EU 2020 reduction target for these sectors of 20%. However, to meet its ESR emissions reduction target for 2030 (39% reduction relative to 2005 levels), efforts beyond the measures currently slated in Denmark's National Energy and Climate Plan may still be needed. Additional action will in any case be required to achieve the revised Danish ESR target for 2030 (-50%) that the European Commission has proposed as part of its Fit for 55 package. In its recovery and resilience plan, Denmark allocates 59% of the available resources to climate objectives and outlines crucial reforms and investments to further the transition to a more sustainable, low-carbon and climate-resilient economy.

Denmark is performing relatively well with respect to environmental taxation. Its environmental tax revenues as a percentage of total tax revenues, as well as in terms of GDP,

are above the EU average (see Graph A5.1). This holds especially for transport taxes, which contribute to one of the highest revenue shares in the EU, as well as, to a smaller extent, taxes on pollution and resources ([23]). It is interesting to note that environmental tax revenues have been decreasing over time, largely due to a reduction in the tax base, as environmental taxation has managed to reduce harmful economic activity. The share of expenditure on environmental protection in total government expenditure is below EU average

Graph A5.1: **Fiscal aspects of the green transition**
Taxation and government expenditure on environmental protection
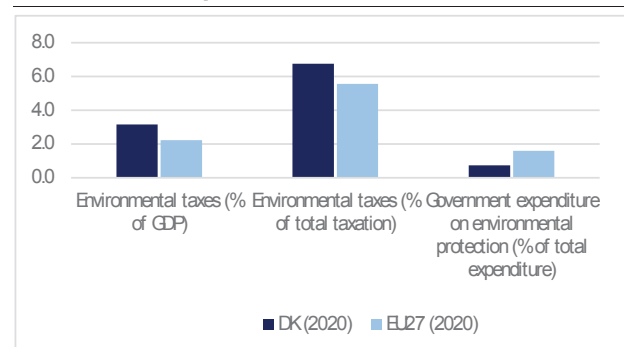
Source: Eurostat

Graph A5.2: **Thematic – Energy**
Share in energy mix (solids, oil, gas, nuclear, renewables)
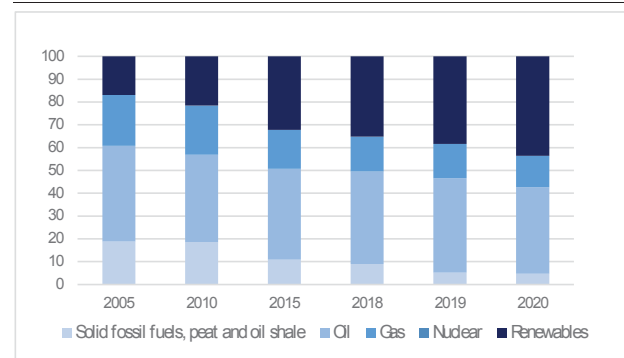
The energy mix is based on gross inland consumption, and excludes heat and electricity. The share of renewables includes biofuels and non-renewable waste.
Source: Eurostat

With 41% of renewables in its energy mix, Denmark is a frontrunner. Nevertheless, oil and petroleum still represent 38% of the country's energy mix (see Graph A5.2).

([22]) 2021 Commission Staff Working Documented annexed to the EU Climate Action Progress Report

([23]) For more information on taxation see Annex 18.

Substantial investments and further streamlining of permitting procedures to remove administrative barriers, in particular in the offshore wind sector, will be required for Denmark to meet its domestic objective of reducing its greenhouse gas emissions by 70% by 2030 (from a 1990 baseline) and for renewables to cover at least 55% of the country's gross final consumption by 2030. In December 2020, the government announced a moratorium on oil & gas exploration, with the objective of ending existing production by 2050.

In terms of biodiversity and ecosystem health, Denmark presents a mixed picture. Considering both Natura 2000 and other nationally designated protected areas, in 2019 Denmark was legally protecting 14.8% of its land areas (EU average 26%) and about 19% of marine areas (EU average 8%) (see Graph A5.3). At the same time, the share of habitats with bad or poor conservation status had increased to 61% and the share of assessments for species with bad or poor conservation status had increased to 95%. The percentage of land covered by forests was 16.4% in 2018, well below EU average of 43.5%. The share of organic farming has increased from 6.3% in 2015 to 11.55% in 2020, just above the EU average of 9.7% (2020).

As regards pollution, the situation of nitrates needs to be carefully monitored ([24]). Regarding air quality, air quality limit values were not exceeded in 2020.

In terms of mobility, Denmark presents a mixed picture. It is among the EU frontrunners in terms of zero-emission passenger cars as a share of new registrations (see Graph A5.4). At the same time, compared to many other EU Member States, electrification of its railway network is underdeveloped.

Graph A5.3: **Thematic – Biodiversity**
Terrestrial protected areas and organic farming

■ Terrestrial protected areas (% total area)
■ Area under organic farming (% total utilised agricultural area)
◇ EU27 (terrestrial)
◇ EU27 (organic)
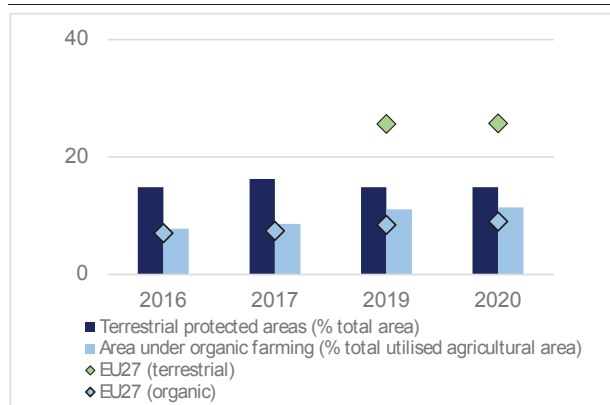
For terrestrial protected areas data for 2018, and data for the EU average (2016, 2017) is lacking.
Source: EEA (terrestrial protected areas) and Eurostat (organic farming)

Graph A5.4: **Thematic – Mobility**
Share of zero-emission vehicles (% of new registrations)

■ DK ◆ EU27
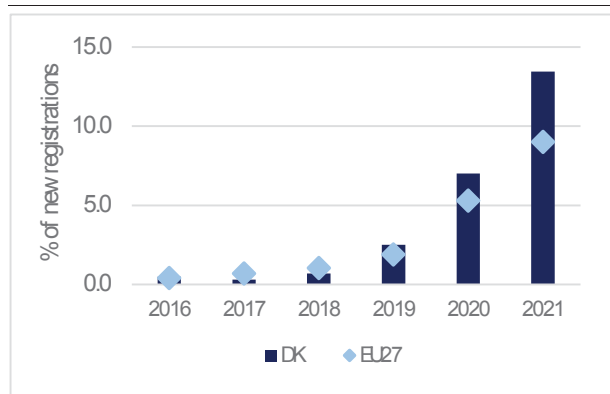
Zero-emission vehicles (passenger cars) include battery and fuel cell electric vehicles (BEV, FCEV)
Source: European Alternative Fuels Observatory

([24]) No data from Eurostat, but according to the last report on the implementation of the Nitrates Directive (SWD/2021/1001 final. 10.11.2021) referring to the change between the periods 2008-11 and 2016-19, groundwater quality has slightly improved as compared to the previous reporting period, with the percentage of stations reaching or exceeding 40 or 50 mg nitrate per L that decreased from 6.9% to 6.7% and from 19.3% to 14.3%, respectively. Annex 15 of the Staff Working Document accompanying the report on the implementation of the Nitrates Directive for the period 2016-2019

Table A5.1: Indicators underpinning progress on European Green Deal from a macroeconomic perspective

		2005	2019	2020	Target 2030	Distance WEM	Distance WAM	'Fit for 55' Target 2030	Distance WEM	Distance WAM
Non-ETS GHG emission reduction target (1)	MTCO2 eq; %; pp (2)	40.4	-20%	-25%	-39%	-3	-3	-50%	-14	-14

		2005	2016	2017	2018	2019	2020	National contribution to 2030 EU target
Share of energy from renewable sources in gross final consumption of energy (1)	%	16%	32%	34%	35%	37%	32%	55%
Energy efficiency: primary energy consumption (1)	Mtoe	19.4	17.3	17.4	17.4	16.8	15.3	18.3
Energy efficiency: final energy consumption (1)	Mtoe	15.5	14.5	14.6	14.6	14.3	13.1	15.8

		DENMARK						EU		
		2015	2016	2017	2018	2019	2020	2018	2019	2020
Fiscal and financial indicators										
Environmental taxes (% of GDP)	% of GDP	4.0	3.9	3.7	3.6	3.3	3.2	2.4	2.4	2.2
Environmental taxes (% of total taxation)	% of taxation (3)	8.6	8.6	8.0	8.2	7.0	6.8	6.0	5.9	5.6
Government expenditure on environmental protection	% of total exp.	0.78	0.77	0.80	0.78	0.78	0.75	1.66	1.70	1.61
Investment in environmental protection	% of GDP (4)	-	-	-	-	-	-	0.42	0.38	0.41
Fossil fuel subsidies	EUR2020bn	1.51	1.46	1.42	1.33	1.37	-	56.87	55.70	-
Climate protection gap (5)	score 1-4	0 out of 4 (decrease from historical level of 1.5). This is a no risk category (4 being a high risk).								
Climate										
Net GHG emissions	1990 = 100	69	72	71	70	65	58	79	76	69
GHG emissions intensity of the economy	kg/EUR10	0.33	0.33	0.32	0.32	0.29	0.29	0.32	0.31	0.30
Energy intensity of the economy	kgoe/EUR10	0.07	0.07	0.06	0.06	0.06	0.06	0.12	0.11	0.11
Energy										
Final energy consumption (FEC)	2015=100	100.0	102.5	103.0	103.1	101.2	92.9	103.5	102.9	94.6
FEC in residential building sector	2015=100	100.0	103.2	101.3	100.2	98.9	97.3	101.9	101.3	101.3
FEC in services building sector	2015=100	100.0	102.7	105.0	104.6	101.1	96.1	102.4	100.1	94.4
Pollution										
Smog-precursor emission intensity (to GDP) (4)	tonne/EUR10 (6)	4.85	4.75	4.92	5.06	4.63	-	0.99	0.93	-
Years of life lost caused due to air pollution by PM2.5	per 100.000 inh.	532	487	478	611	530	-	863	762	-
Years of life lost due to air pollution by NO2	per 100.000 inh.	15	15	6	2	< 1	-	120	99	-
Nitrate in ground water	mg NO3/litre	-	-	-	-	-	-	21.7	20.7	-
Biodiversity										
Terrestrial protected areas	% of total	-	14.8	16.3	-	14.8	14.8	-	25.7	25.7
Marine protected areas	% of total	-	18.2	-	-	18.7	-	-	10.7	-
Organic farming	% of total utilised agricultural area	6.3	7.8	8.6	9.8	11.1	11.5	8.0	8.5	9.1

		2000-2006	2006-2012	2012-2018	00-06	06-12	12-18
Net land take	per 10,000 km2	22.2	18.7	9.4	13.0	11.0	5.0

		2015	2016	2017	2018	2019	2020	2018	2019	2020
Mobility										
GHG emissions intensity of transport (to GVA) (7)	kg/EUR10	2.99	2.97	3.02	3.14	2.81	3.55	0.89	0.87	0.83
Share of zero emission vehicles (8)	% in new registrations	2.2	0.6	0.3	0.7	2.5	7.2	1.0	1.9	5.4
Number of plug-in electric vehicles per charging point		6	4	5	6	9	18	8	8	12
Share of electrified railways	%	24.3	24.5	25.4	26.1	32.3	-	55.6	56.0	-
Congestion (average number of hours spent in road congestion per year by a representative commuting driver)		22.9	24.3	24.6	25.2	25.8	-	28.9	28.8	-

		Year	DK	EU
Digital				
Share of smart meters in total metering points (9) - electricity	% of total	2018	69.1	35.8
Share of smart meters in total metering points (9) - gas	% of total	2018	0.0	13.1
ICT used for environmental sustainability (10)	%	2021	53.9	65.9

(1) The 2030 non-ETS GHG target is set in the Effort Sharing Regulation. The Fit for 55 targets are those in the Commission's proposal to increase EU's climate ambition by 2030. Renewables and Energy Efficiency targets and national contributions under the Governance Regulation (Regulation (EU) 2018/1999).

(2) Distance to target is the gap between Member States' 2030 target under the Effort Sharing Regulation and projected emissions, with existing measures (WEM) and with additional measures (WAM) respectively, as a percentage of 2005 base year emissions.

(3) Percentage of total revenues from taxes and social contributions (excluding imputed social contributions). Revenues from the ETS are included in environmental tax revenues (in 2017 they amounted to 1.5% of total environmental tax revenues at the EU level).

(4) Covers expenditure on gross fixed capital formation to be used for the production of environmental protection services (i.e. abatement and prevention of pollution) covering all sectors, i.e. government, industry and specialised providers.

(5) The climate protection gap indicator is part of the European adaptation strategy (February 2021), and is defined as the share of non-insured economic losses caused by climate-related disasters.

(6) Sulphur oxides (SO2 equivalent), Ammonia, Particulates < 10μm, Nitrogen oxides in total economy (divided by GDP).

(7) Transportation and storage (NACE Section H).

(8) Zero emission vehicles include battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV).

(9) European Commission Report (2019) 'Benchmarking smart metering deployment in the EU-28'.

(10) European Commission (2021). Each year the DESI is re-calculated for all countries for previous years to reflect any possible change in the choice of indicators and corrections to the underlying data. Country scores and rankings may thus differ compared with previous publications.

Source: Eurostat, JRC, European Commission, EEA, EAFO

The green transition not only encompasses improvements to environmental sustainability, but also includes a significant social dimension. While measures in this regard include the opportunity for sustainable growth and job creation, it must also be ensured that no one is left behind and all groups in society benefit from the transition. Denmark envisages a continuation of substantial green investments, providing strong potential for job creation; at the same time, the green economy is significant. The social dimension of the green transition is less likely to be an issue.

Denmark's recovery and resilience plan (RRP) outlines several crucial reforms and investments for a fair green transition. With EUR 923 million allocated towards green measures, these funds make up 59% of the total Danish RRP budget. This includes measures to improve energy efficiency by renovating private and public buildings, and by supporting such measures for small and medium-sized enterprises (SMEs). Among other things, these initiatives will help mitigate pollution, create labour-intensive renovation jobs and support local supply chains, while generating demand for highly energy and resource efficient equipment. In synergy with the Recovery and Resilience Facility, the European Social Fund Plus (ESF+) will help unlock the potential for 'green jobs' in Denmark; and the Just Transition Fund (EUR 89 million) will help mitigate the social impact of the green transition. Denmark's National Energy and Climate Plan (NECP) briefly considers the just and fair transition aspects of its policies, and provides information on the social, employment and skills impacts of the transition to a climate-neutral economy, including the need for skills and employment in the energy sector and in clean transition industries. Energy poverty is partially addressed in the NECP, with Denmark indicating that the issue is addressed through national social measures, such as heating supplements and supplementary benefits, though a target of reducing energy poverty could further enable support for vulnerable consumers through specific and measurable objectives [25].

The carbon footprint of the economy has slightly decreased and major greenhouse gas emitting sectors (such as the cement sector) remain sizeable. However, the green economy is significant and provides strong potential for further quality job creation. The intensity of greenhouse gas emissions in the Danish economy decreased between 2015 and 2020 (in terms of gross value added) and stands 17% above the EU average. In contrast, Denmark has the highest average carbon footprint per worker at 24.66 tonnes of greenhouse gas emissions in the EU (where the average is 13.61 tonnes) (see Graph A6.1). Energy-intensive industries (EII) provide jobs for a low percentage of the total workforce (1.31%), which is well below the EU average (3%). Cement has been identified as a transforming sector [26], with job losses estimated at around 350 direct jobs, as well as further impact on the subcontractors and the regional economy [27]. Modernising regional economies and increasing their competitiveness is key, in which the transition to a circular economy, innovation, implementation of advanced technologies and up- and reskilling could play an important role (see Annex 15). The environmental goods and services sector already provides jobs to a significant share of the employed population (2.6% vs. 2.2% in the EU) [28] and wind and solar energy potential as well as energy efficiency improvements offer further opportunities for green jobs [29]. Labour shortages in greening sectors such as professional, scientific and technical activities have been identified [30].

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[26] SWD(2021) 275 final

[27] 2020 European Semester: Overview of Investment Guidance on the Just Transition Fund 2021-2027 per Member State (Annex D)

[28] There is currently no common EU-wide definition of green jobs. The environmental goods and services sector (EGSS) accounts only report on an economic sector that generates environmental products, i.e. goods and services produced for environmental protection or resource management.

[29]
https://publications.jrc.ec.europa.eu/repository/handle/JRC126047

[30] Eurofound (2021), Tackling labour shortages in EU Member States, Publications Office of the European Union, Luxembourg.

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[25] SWD(2020) 903 final

As regards the social dimension of the green transition, ensuring access to essential transport and energy services appears overall to be less of a challenge for Denmark than for other EU countries. A relatively low but stable share of the population at risk of poverty lives in rural areas (10.2% vs 18.7% in the EU) [31]. The share of the population who are unable to keep their homes adequately warm slightly improved between 2015 and 2020 (from 3.6% to 3%), which remains significantly below the EU average (8.2%), with a higher incidence among lower-income groups (see Graph A6.2). Consumption patterns vary across the population: the average carbon footprint of the top 10% of emitters is about 5 times higher than that of the bottom 50% of the population (5.3 times in the EU).

Tax systems are key to ensuring a fair transition towards climate neutrality [32]. Denmark's revenues from total environmental taxes decreased from 3.97% of GDP in 2015 to 3.29% in 2019, and remained relatively stable in 2020, reaching 3.17% of GDP (against 2.24% in the EU). The labour tax wedge for low-income earners [33] slightly decreased from 31.1% in 2015 to 30.4% in 2019. It stood at 30.5% in 2021 compared to 31.9% in the EU (see Annex 18). Redistributive measures accompanying environmental taxation could potentially promote progressive measures and have a positive impact on the disposable income of households in the bottom 20% of the income distribution [34].

Graph A6.1: **Fair green transition challenges**
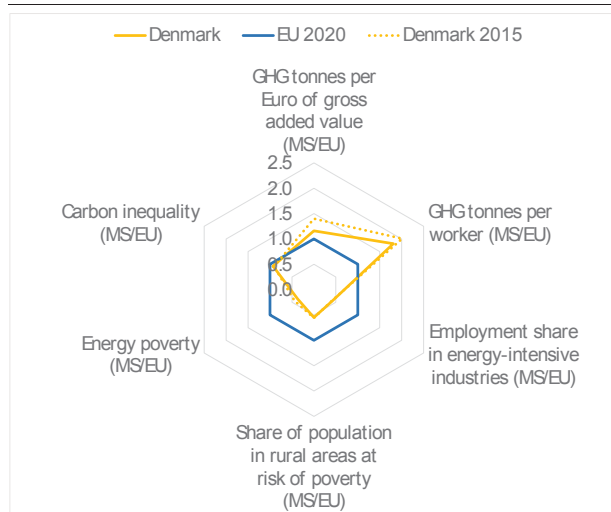
(1) Numbers are the normalised indicator performance, signifying factors relative to EU27 average

Source: Eurostat, World Inequality Database

Graph A6.2: **Energy poverty by income decile**
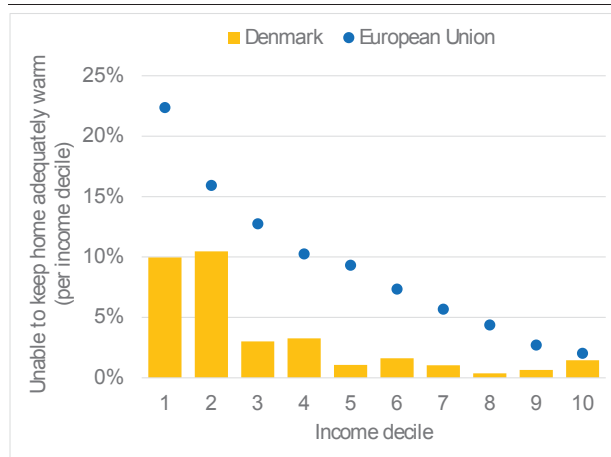
Source: Eurostat EU-SILC survey (2020)

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[31] Based on COM(2021) 568 final (Annex I) as a proxy for potential transport challenges in the context of the green transition (e.g. due to vulnerability to fuel prices).

[32] COM(2021) 801 final

[33] Tax wedge for a single earner at 50% of the national average wage. Source: Tax and benefits database, European Commission/OECD.

[34] SWD(2021) 641 final PART 3/3

The efficient use of resources is key to ensuring competitiveness and open strategic autonomy, while minimising the environmental impact. The green transition presents a major opportunity for European industry by creating markets for clean technologies and products. It will have an impact across the entire value chains in sectors such as energy and transport, construction and renovation, food and electronics, helping create sustainable, local and well-paid jobs across Europe.

With respect to the circular economy, Denmark could do better. Between 2016 and 2020, the circular (secondary) use of material in Denmark declined from 8% in 2016 to 7.7% in 2020, well below the EU average of 12.8%. With 1.62 PPS (^{35}) generated per kg of material consumed in 2020, resource productivity (^{36}) in Denmark is below the EU average of 2.23 PPS per kg and showed no signs of convergence in the last years on record. Denmark also fell below the EU average for three circular economy indicators relating to employment, value-added and private investments.

Denmark is taking some steps to become more circular. The national Action Plan for Circular Economy from July 2021 (^{37}) contains 129 measures running up to 2032, with a focus on waste prevention and recycling, and gives an extra focus on how value chains within biomass, construction and plastics can become more circular. Furthermore, Denmark is leveraging ERDF programmes that provide support for the circular economy, in particular for strengthening the competitiveness and innovativeness of SMEs.

In certain areas of waste management Denmark is underperforming. It has the highest municipal waste per capita figure in the EU with 845 kg/year/inhabitant in 2020 (EU average 505 kg/year/inhabitant). Furthermore, in 2020, 45.2% of municipal waste was still incinerated (albeit with energy recovery) compared to the EU average of 27.1%. In terms of municipal waste collected for recycling, Denmark ranks just above the EU average (53.9% in 2020 (EU average 47.8%)), but with clear room for improvement. In 2018, hazardous waste also accounted for 10% of total waste generated.

Graph A7.1: **Municipal waste treatment**
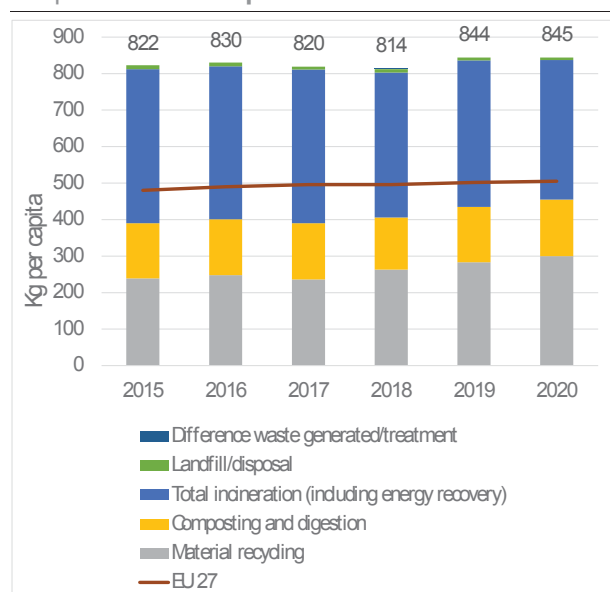
Source: Eurostat

(^{35}) 'PPS per Kilogram' (GDP in current prices expressed in Purchasing Power Standards). Purchasing Power Standards are fictive 'currency' units that remove differences in purchasing power, hence eliminate differences in price levels across countries; to be used when comparing across countries at one point in time

(^{36}) Resource productivity expresses how efficiently the economy uses material resources to produce wealth. Improving resource productivity can help to minimise negative impacts on the environment and reduce dependency on volatile raw material markets.

(^{37}) Danish Action Plan for Circular Economy July 2021

Table A7.1: Selected resource efficiency indicators

SUB-POLICY AREA	2015	2016	2017	2018	2019	2020	EU27	Latest year EU 27
Circularity								
Resource Productivity (Purchasing power standard (PPS) per kilogram)	1.5	1.5	1.6	1.6	1.6	1.7	2.2	2020
Material Intensity (kg/EUR)	0.6	0.6	0.6	0.6	0.6	0.6	0.4	2020
Circular Material Use Rate (%)	8.3	8.0	7.9	8.1	7.6	7.7	12.8	2020
Material footprint (Tones/capita)	22.2	22.7	23.4	23.0	24.0	-	14.6	2019
Waste								
Waste generation (kg/capita, total waste)	-	3663	-	3702	-	-	5234	2018
Landfilling (% of total waste treated)	-	28.7	-	5.9	-	-	38.5	2018
Recycling rate (% of municipal waste)	47.4	48.3	47.6	49.9	51.5	53.9	47.8	2020
Hazardous waste (% of municipal waste)	-	9.6	-	9.8	-	-	4.3	2018
Competitiveness								
Gross value added in environmental goods and services sector (% of GDP)	3.0	3.2	3.3	3.2	3.4	3.2	2.3	2018
Private investment in circular economy (% of GDP)	0.1	0.1	0.1	0.1	-	-	0.1	2018

Source: Eurostat

The Digital Economy and Society Index (DESI) monitors EU Member States' digital progress. The areas of human capital, digital connectivity, the integration of digital technologies by businesses and digital public services reflect the Digital Decade's four cardinal points. This Annex describes Denmark's DESI performance.

The Danish recovery and resilience plan (RRP) dedicates 25% of its allocation to measures supporting the digital transformation. The Danish government has taken the first steps in its new National Digital strategy with the budget act of 2022. Further initiatives will be presented, when the overall National Digital Strategy is launched in 2022.. The planned sub reforms in the strategy will focus on further digitalising the public administration and preparing it for future challenges, including, targets to increase public-private innovation partnerships, uptake of AI technologies in public sector and adopting a new cybersecurity strategy. In addition, the plan aims to improve broadband connectivity and digital solutions in the health sector.

The shortage of ICT specialists is a key challenge for Denmark in the DESI dimension on human capital. The country scores well above the EU average in basic and above basic digital skill and the percentage of ICT specialists is slightly above the EU average. However, there is a growing problem filling ICT specialist vacancies and the share of firms reporting hard-to-fill vacancies for jobs requiring ICT specialist skills is above the EU average (58.1% compared to 55.4%) ([38]).

Denmark is a leader when it comes to digital connectivity ensuring wide coverage of fast broadband internet. Denmark scores significantly above the EU average both in terms of Very High Capacity Network and 5G coverage, but take-up of at least 1 Gbps is only close to EU average (7.25% compared to 7.58%).

Danish companies embrace digital technologies. 79% of SMEs have at least a basic level of digital intensity. Twice as many companies use big data and cloud technologies as the EU average. On Artificial Intelligence Danish companies are the top performers in the EU. The share of enterprises having medium/high intensity of green action through ICT is below the EU average (54% compared to 66%). Improvements in this field could accelerate the country's transition towards a greener economy.

Denmark is in the leading group, but not the top performer concerning wide availability of digital public services. The country scores above EU average for digital public services for both citizens and businesses.

([38]) Source: Eurostat – European Union Survey on ICT Usage and eCommerce in Enterprises

Table A8.1: **Key Digital Economy and Society Index Indicators**

| Human capital | Denmark | | | EU | EU top-performance |
	DESI 2020	DESI 2021	DESI 2022	DESI 2022	DESI 2022
At least basic digital skills	**NA**	**NA**	**69%**	**54%**	**79%**
% individuals			2021	2021	2021
ICT specialists	**5.1%**	**5.3%**	**5.6%**	**4.5%**	**8.0%**
% individuals in employment aged 15-74	2019	2020	2021	2021	2021
Female ICT specialists	**22%**	**23%**	**23%**	**19%**	**28%**
% ICT specialists	2019	2020	2021	2021	2021
Connectivity					
Fixed Very High Capacity Network (VHCN) coverage	**93%**	**94%**	**95%**	**70%**	**100%**
% households	2019	2020	2021	2021	2021
5G coverage (*)	**NA**	**80%**	**98%**	**66%**	**99.7%**
% populated areas		2020	2021	2021	2021
Integration of digital technology					
SMEs with at least a basic level of digital intensity	**NA**	**NA**	**79%**	**55%**	**86%**
% SMEs			2021	2021	2021
Big data	**14%**	**27%**	**27%**	**14%**	**31%**
% enterprises	2018	2020	2020	2020	2020
Cloud	**NA**	**NA**	**62%**	**34%**	**69%**
% enterprises			2021	2021	2021
Artificial Intelligence	**NA**	**NA**	**24%**	**8%**	**24%**
% enterprises			2021	2021	2021
Digital public services					
Digital public services for citizens	**NA**	**NA**	**83**	**75**	**100**
Score (0 to 100)			2021	2021	2021
Digital public services for businesses	**NA**	**NA**	**89**	**82**	**100**
Score (0 to 100)			2021	2021	2021

(*) The 5G coverage indicator does not measure users' experience, which may be affected by a variety of factors such as the type of device used, environmental conditions, number of concurrent users and network capacity. 5G coverage refers to the percentage of populated areas as reported by operators and national regulatory authorities.
Source: Digital Economy and Society Index

This Annex provides a general overview of the performance of the Danish research and innovation system. In the 2021 edition of the European Innovation Scoreboard ([39]), Denmark is an innovation leader, and is in third place overall in the EU. Although still largely exceeding the EU average, Denmark's innovation performance relative to the EU has decreased somewhat over time.

Denmark has a good R&D ecosystem, which is underpinned by significant investment and excellent scientific, technological and innovation outputs. Denmark ranked first in the EU in 2020 in terms of public research intensity (public expenditure on R&D as a percentage of GDP) and it also ranks high on overall R&D intensity (GERD as % of GDP) and business enterprise expenditure on R&D (BERD). This high R&D investment translates into high scientific and technological outputs, performing well above the EU average in terms of high-quality publications and patents, including environmental-related patents, where it more than doubles the EU average. This strong performance reflects the connection of the Danish research and innovation (R&I) system with its ambition to take advantage of the opportunities that the green transformation will open up.

Despite the many strengths of the Danish R&I system, investment is concentrated in a small number of large companies and growing productivity gaps between large and small companies suggest weaknesses in the diffusion of technological advances. Broadening the innovation base and involving more companies in R&D activities would promote innovation diffusion ([40]). Denmark's recovery and resilience plan has a strong R&D focus, with more than 17% of the total spending earmarked for R&D projects. Achieving Denmark's ambitious greenhouse gas emissions reduction targets also requires incentives for research and innovation. Therefore, the 'green research and development' component contains a temporary increase in R&D tax deductibility for all

companies, while the mission-based R&D partnerships will focus on four solutions to address the challenges to achieving Denmark's ambitious climate goals. The focus on broadening the innovation base and R&D for the green transition is also evident in the Danish Cohesion Policy programmes.

([39]) 2021 European Innovation Scoreboard, Country profile: Denmark https://ec.europa.eu/docsroom/documents/45911

([40]) Peer review of Danish R&I system, Horizon 2020 Policy Support Facility, 2019

Table A9.1: Key research, development and innovation indicators

Denmark	2010	2015	2018	2019	2020	Compound annual growth 2010-20	EU average
Key indicators							
R&D Intensity (GERD as % of GDP)	2.92	3.05	*2.97*	*2.93*	*3.03*	0.4	*2.32*
Public expenditure on R&D as % of GDP	0.95	1.11	*1.08*	*1.09*	*1.18*	2.2	*0.78*
Business enterprise expenditure on R&D (BERD) as % of GDP	1.96	1.94	1.87	*1.84*	*1.84*	-0.63	*1.53*
Quality of the R&I system							
Scientific publications of the country within the top 10% most cited publications worldwide as % of total publications of the country	14.9	14.4	13.7	:	:	-1.1	9.9
PCT patent applications per billion GDP (in PPS)	6.3	6.0	6.0	:	:	-0.7	3.5
Academia-business cooperation							
Public-private scientific co-publications as % of total publications	12.4	12.1	12.8	12.5	11.7	-0.6	9.05
Human capital and skills availability							
New graduates in science & engineering per thousand pop. aged 25-34	15.8	17.1	19.6	19.6	**:**	2.9	16.3
Public support for business enterprise expenditure on R&D (BERD)							
Total public sector support for BERD as % of GDP	0.070	0.089	:	0.093	:	3.1	0.196
R&D tax incentives: foregone revenues as % of GDP	0.003	0.020	0.031	0.031	:	31.8	0.100
Green innovation							
Share of environment-related patents in total patent applications filed under PCT (%)	22.5	20.4	25.7	:	:	1.7	12.8
Finance for innovation and Economic renewal							
Venture Capital (market statistics) as % of GDP	0.045	0.028	0.057	0.080	0.094	7.7	0.054
Employment in fast-growing enterprises in 50% most innovative sectors	6.5	4.5	5.6	5.7	:	-1.4	5.5

Source: DG Research and Innovation - Common R&I Strategy and Foresight Service - Chief Economist Unit. Eurostat, OECD, DG JRC, Science-Metrix (Scopus database and EPO's Patent Statistical database), Invest Europe

Productivity growth is a critical driver of economic prosperity, well-being and convergence over the long run. A major source of productivity for the EU economy is a well-functioning single market, where fair and effective competition and a business-friendly environment are ensured, in which Small and Medium Enterprises (SMEs) can operate and innovate without difficulty. Businesses and industry rely heavily on robust supply chains and are facing bottlenecks that bear a negative impact on firms' productivity levels, employment, turnover and entry/exit rates. This may impact the Member States' capacity to deliver on Europe's green and digital transformation.

Denmark's labour productivity level is high compared to other EU Member States and productivity growth has been strong, especially in manufacturing. Denmark has a strong manufacturing sector, with labour productivity above the average of other Nordic countries, while productivity growth in services is slightly lagging behind. The Danish economy is a frontrunner in green growth and digitalisation. However, skills shortages are denting further growth. Moreover, R&D activity remains concentrated in few large firms, while the contribution of SMEs is modest (see Annex 8). Productivity growth is fundamental for maintaining the relatively high level of welfare in Denmark and for ensuring the country's competitiveness in the longer term.

Denmark has a stable and favourable business environment. Firms benefit from an easy access to digital public services. Among the long-term barriers to investment, Danish firms most frequently cite availability of skilled staff (75%) [41]. While many companies are created in Denmark, start-ups and small and innovative companies struggle to grow and scale up. Late payments can be a problem for certain small companies and the rate of SMEs whose bank loans' applications were refused or rejected as well as the share of finance constrained firms are above the EU average. Equity financing is less pronounced than in some of the other Nordic countries but better than EU average.

Denmark is well-integrated into the single market. Denmark's trade integration in the single market for goods and services is in line with the EU average. It has slightly increased in recent years regarding trade in goods, while it has slightly decreased regarding trade in services. Overall, Denmark is performing relatively well on the Single Market Scoreboard.

As in other countries, global supply chain disruptions are currently denting growth. Danish manufacturing firms have been grappling with supply problems for key raw materials and components, as well as price increases. 25% of firms reported disruptions to their operations due to shortages in materials or equipment in 2021 (vs. 26% for the EU average). At the same time, firms in the logistics sector benefited from the surge in demand and increased prices. At the beginning of 2022 business confidence has fallen to an 11-month low and has turned pessimistic for the first time since February 2021 [42].

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[41] https://www.eib.org/en/publications/econ-eibis-2021-eu

[42] Statistics Denmark, Business Tendency Survey

Table A10.1: **Key Single Market and Industry Indicators**

SUB-POLICY AREA	INDICATOR NAME	DESCRIPTION	2021	2020	2019	2018	2017	Growth rates	EU27 average*
HEADLINE INDICATORS									
Economic structure	Value added by source (domestic)	VA that depends on domestic intermediate inputs, % [source: OECD (TiVA), 2018]				68,48			**62,6%**
	Value added by source (EU)	VA imported from the rest of the EU, % [source: OECD (TiVA), 2018]				16,78			**19,7%**
	Value added by source (extra-EU)	% VA imported from the rest of the world, % [source: OECD (TiVA), 2018]				14,7			**17,6%**
Cost competitiveness	Producer energy price (industry)	Index (2015=100) [source: Eurostat, sts_inppd_a]	189,1	86,9	114,3	124,2	101	**87,2%**	**127,3**
RESILIENCE									
Shortages/supply chain disruptions	Material Shortage using survey data	Average (across sectors) of firms facing constraints, % [source: ECFIN CBS]	25	5	4	8	5	**400%**	**26%**
	Labour Shortage using survey data	Average (across sectors) of firms facing constraints, % [source: ECFIN CBS]	23	5	10	11	9	**156%**	**14%**
	Sectoral producer prices	Average (across sectors), 2021 compared to 2020 and 2019, index [source:Eurostat]						**7,4%**	**5,4%**
Strategic dependencies	Concentration in selected raw materials	Import concentration a basket of critical raw materials, index [source: COMEXT]	0,16	0,15	0,15	0,15	0,17	**-6%**	**17%**
	Installed renewables electricity capacity	Share of renewable electricity to total capacity, % [source:Eurostat, nrg_inf_epc]		46,10	45,40	45,90	43,00	**7%**	**47,8%**
Investment dynamics	Net Private investments	Change in private capital stock, net of depreciation, % GDP [source: Ameco]		4,4	4,1	4,5	4,2	**4,8%**	**2,6%**
	Net Public investments	Change in public capital stock, net of depreciation, % GDP [source: Ameco]		1	0,6	0,8	0,7	**43%**	**0,4%**

(Continued on the next page)

SINGLE MARKET								
Single Market integration	Intra-EU trade	Ratio of Intra-EU trade to Extra-EU trade, index [source: Ameco]	1,55	1,48	1,45	1,51	1,46	**6%**	**1,59**
Professional services restrictiveness	Regulatory restrictiveness indicator	Restrictiveness of access to and exercise of regulated professions (professions with above median restrictiveness, out of the 7 professions analysed in SWD (2021)185 [source: SWD (2021)185; SWD(2016)436 final])	2				2	**0%**	**3,37**
Professional qualifications recognition	Recognition decisions w/o compensation	Professionals qualified in another EU MS applying to host MS, % over total decisions taken by host MS [source: Regulated professions database]	73,4						**45%**
Compliance - cooperation EC and MS	Transposition - overall	5 sub-indicators, sum of scores [source: Single Market Scoreboard]		Above average	On average	On average	Above average		
	Infringements - overall	4 sub-indicators, sum of scores [source: Single Market Scoreboard]		Above average	On average	On average	Above average		
Investment protection	Confidence in investment protection	Companies confident that their investment is protected by the law and courts of MS if something goes wrong, % of all firms surveyed [source: Flash Eurobarometer 504]	76						**56%**
BUSINESS ENVIRONMENT - SMEs								
Business demography	Bankruptcies	Index (2015=100) [source: Eurostat, sts_rb_a]	n.a.	n.a.	228,2	187,4	162,1	**40,8%**	**70,1**
	Business registrations	Index (2015=100) [source: Eurostat, sts_rb_a]	n.a.	n.a.	141,7	142,8	125,9	**0,125**	**105,6**
	Late payments	Share of SMEs experiencing late payments in past 6 months, % [source: SAFE]	35,1	24,9	38,7	n.a.	n.a.	**-9%**	**45%**
Access to finance	EIF Access to finance index - Loan	Composite: SME external financing over last 6 months, index from 0 to 1 (the higher the better) [source: EIF SME Access to Finance Index]		0,38	0,26	0,21	0,31	**23,5%**	**0,56**
	EIF Access to finance index - Equity	Composite: VC/GDP, IPO/GDP, SMEs using equity, index from 0 to 1 (the higher the better) [source: EIF SME Access to Finance Index]		0,3	0,23	0,48	0,33	**-9,7%**	**0,18**
	% of rejected or refused loans	SMEs whose bank loans' applications were refused or rejected, % [source: SAFE]	26,7	26,5	28,2	6,7	11,1	**140,0%**	**12,4%**
Public procurement	SME contractors	Contractors which are SMEs, % of total [source: Single Market Scoreboard]		50	45	43	55	**-9,1%**	**63%**
	SME bids	Bids from SMEs, % of total [source: Single Market Scoreboard]		54	55	52	53	**2%**	**70,8%**

(*) latest available

Source: See above in the table the respective source for each indicator in the column "Description"

Good administrative capacity enables economic prosperity, social progress, and fairness. Public administrations at all government levels deliver crisis response, ensure the provision of public services, and contribute to building resilience for the sustainable development of the EU economy.

Denmark's public administration is ranked among the most effective in the EU27 ([43]**).** The Danish authorities work on various initiatives to improve administrative performance. Areas of particular focus are cross-policy coordination, digital services, as well as increasing and ensuring the proximity of public services. ([44])

Denmark is among the best performers when it comes to e-government, offering highly mature digital services. It ranks above the average on the e-government benchmark's composite indicator (84.3 vs. 70.9 in the EU). The share of users of e-government services is high at 93% in 2021. Against this backdrop, the Danish Recovery and Resilience Plan aims to strengthen the capacity and resilience of public administration by modernising the digital infrastructure, improving cyber and information security in the public administration, and promoting better access to data and interoperable data infrastructure. The latter will also be addressed with the regional development support.

Administrative capacity is strong. The share of civil servants participating in adult learning is above the EU average, as is the share of employees in public services who have tertiary education qualifications. Denmark has one of the EU's youngest public workforces with 43% of employees under 39 years old, and a relatively low share of public sector employees between 55 and 74 years (20.9% in 2021). However, gender parity for senior positions is relatively low, with a deviation from parity nearly twice as high as the average (47.2 vs 21.8 in the EU).

Denmark could improve its performance on evidence-based policy making. Its performance on stakeholder engagement and ex-post assessment of legislation is below the EU median (see Graph 10.1)

Graph A11.1: **Performance on evidence-based policy- making indicators**
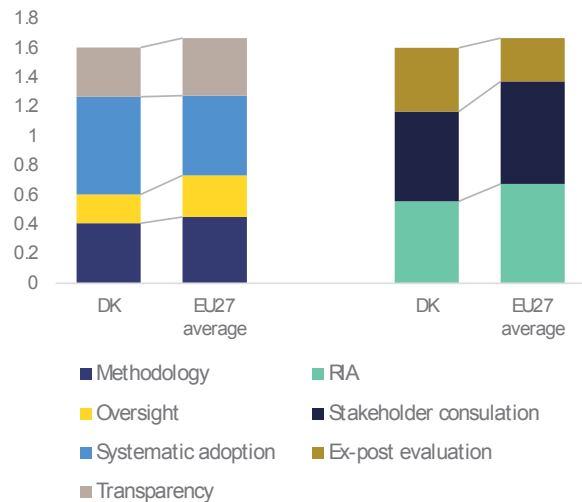
(1) RIA: regulatory impact assessment
Source: OECD iREG indicators

The justice system performs efficiently. The clearance rate for litigious civil and commercial cases improved markedly in 2020 (111.1%, up from 91.78% in 2019). The overall quality of the justice system is good. Digital tools are used in courts; however, a number of gaps regarding digitalisation in the justice system remain to be addressed. As regards judicial independence, no systemic deficiencies have been reported. ([45])

([43]) Worldwide Governance Indicators, 2020.

([44]) European Commission, Directorate-General for Structural Reform Support, Public administration and governance: "European Public Administration Country Knowledge, Country brief 2021, Denmark", Publications Office, 2022.

([45]) For more detailed analysis of the performance of the justice system in Denmark, see the 2022 EU Justice Scoreboard (forthcoming) and the country chapter for Denmark of the Commission's 2022 Rule of Law Report (forthcoming).

Table A11.1: **Public administration indicators**

Indicator (1)	2017	2018	2019	2020	2021	EU27
E-government						
1 Share of individuals who used internet within the last year to interact with public authorities (%)	92.0	94.0	94.0	92.0	93.0	70.8
2 2021 e-government benchmark´s overall score (2)	na	na	na	na	84.3	70.9
Open government and independent fiscal institutions						
3 2021 open data maturity index	na	na	na	na	91.3	81.1
4 Scope Index of Fiscal Institutions	46.3	46.3	46.3	46.3	na	56.8
Educational attainment level, adult learning, gender parity and ageing						
5 Share of public administration employees with tertiary education, levels 5-8 (3)	58.1	59.3	61.6	62.3	64.7	55.3
6 Participation rate of public administration employees in adult learning (3)	34.8	29.7	35.0	27.0	31.5	18.6
7 Gender parity in senior civil service positions (4)	50.6	52.6	39.6	40.0	47.2	21.8
8 Share of public sector workers between 55 and 74 years (3)	22.6	22.4	22.0	20.7	20.9	21.3
Public Financial Management						
9 Medium term budgetary framework index	0.62	0.62	0.62	0.62	na	0.72
10 Strength of fiscal rules index	1.0	1.0	1.0	1.0	na	1.5
11 Public procurement composite indicator	7.7	4.0	7.7	5.0	na	-0.7
Evidence-based policy making						
12 Index of regulatory policy and governance practices in the areas of stakeholder engagement, Regulatory Impact Assessment (RIA) and ex post evaluation of legislation	1.61	na	na	1.61	na	1.7

(1) High values stand for good performance barring indicators # 7 and 8.
(2) Measures the user centricity (including for cross-border services) and transparency of digital public services as well as the existence of key enablers for the provision of those services.
(3) Break in the series in 2021.
(4) Defined as the absolute value of the difference between the share of men and women in senior civil service positions.
Source: ICT use survey, Eurostat (#1); E-government benchmark report (#2); Open data maturity report (#3); Fiscal Governance Database (#4, 9, 10); Labour Force Survey, Eurostat (#5, 6, 8); European Institute for Gender equality (#7); Single Market Scoreboard public procurement composite indicator (#11); OECD Indicators of Regulatory Policy and governance (#12)

ANNEX 12: EMPLOYMENT, SKILLS AND SOCIAL POLICY CHALLENGES IN LIGHT OF THE EUROPEAN PILLAR OF SOCIAL RIGHTS

The European Pillar of Social Rights provides the compass for upward convergence towards better working and living conditions in the EU. The implementation of its 20 principles on equal opportunities and access to the labour market, fair working conditions, social protection and inclusion, supported by the 2030 EU headline targets on employment, skills and poverty reduction, will strengthen the EU's drive towards a digital, green and fair transition. This Annex provides an overview of Denmark's progress in achieving the goals under the European Pillar of Social Rights.

The Danish labour market was performing well prior to the outbreak of COVID-19 and has shown resilience to the pandemic. It now faces labour shortages. The employment rate is relatively high, at 79.0%, with a comparatively low gender employment gap of 6.9% (10.8% in the EU in 2021). The long-term unemployment rate remained relatively low throughout the crisis (1.0% in 2021), well below the EU average (2.4%). Wholesale and retail trade, accommodation and food service activities were the areas most affected by the COVID-19 crisis. However, the government's wage compensation scheme prevented a surge in unemployment. Labour market shortages are at the highest level since 2008, with increasing recruitment challenges observed across most industries and regions and an unsuccessful recruitment rate of 33% (December 2021). EU Cohesion Policy funding will support measures addressing skills needs for fair digital and green transitions, with funding under the REACT-EU instrument (Recovery Assistance for Cohesion and the Territories of the EU) further supporting these measures, as well as entrepreneurs and innovation. Tackling these challenges is also key to contribute to reaching the 2030 EU headline target on employment.

Table A12.1:**Social Scoreboard**

Equal opportunities and access to the labour market	Early leavers from education and training (% of population aged 18-24) (2021)	9.8
	Individuals' level of digital skills (% of population 16-74) (2021)	69.0
	Youth NEET (% of total population aged 15-29) (2021)	8.4
	Gender employment gap (percentage points) (2021)	6.9
	Income quintile ratio (S80/S20) (2020)	4.0
Dynamic labour markets and fair working conditions	Employment rate (% population aged 20-64) (2021)	79.0
	Unemployment rate (% population aged 15-74) (2021)	5.1
	Long term unemployment (% population aged 15-74) (2021)	1.0
	GDHI per capita growth (2008=100) (2020)	116.9
Social protection and inclusion	At risk of poverty or social exclusion (in %) (2020)	16.8
	At risk of poverty or social exclusion for children (in %) (2020)	13.4
	Impact of social transfers (other than pensions) on poverty reduction (% reduction of AROP) (2020)	52.4
	Disability employment gap (ratio) (2020)	18.1
	Housing cost overburden (% of population) (2020)	14.1
	Children aged less than 3 years in formal childcare (% of under 3-years-olds) (2020)	67.7
	Self-reported unmet need for medical care (% of population 16+) (2020)	1.7

Critical situation	To watch	Weak but improving	Good but to monitor	On average	Better than average	Best performers

Update of 29 April 2022. Members States are classified on the Social Scoreboard according to a statistical methodology agreed with the EMCO and SPC Committees. It looks jointly at levels and changes of the indicators in comparison with the respective EU averages and classifies Member States in seven categories. For methodological details, please consult the Joint Employment Report 2022. Due to changes in the definition of the individuals' level of digital skills in 2021, exceptionally only levels are used in the assessment of this indicator; NEET: neither in employment nor in education and training; GDHI: gross disposable household income. The housing cost overburden rate is the percentage of the population living in households where the total housing costs ('net' of housing allowances) represent more than 40 % of disposable income ('net' of housing allowances).
Source: Eurostat, Social Scoreboard

The declining adult learning participation rate poses challenges to Denmark, especially in view of the green and digital transitions. A decrease was recorded in recent years in adult participation in learning over the past four weeks (from 28% in 2016 to 22.4% in 2021), though the rate remains more than twice the EU average. At the same time, the share of early leavers from education and training has decreased, although remaining above the 2015 low. The difference between native-born and foreign-born children is

relatively small (1.4 pps). Denmark has relatively low vocational education and training (VET) participation rates, and attracting students remains a key challenge. It has taken several policy measures in this domain, including a marked increase in public expenditure on primary schools and additional funding for upskilling measures to be implemented in 2020-22. The share of individuals with basic or above basic digital skills is high, at 69% in 2021. There is nonetheless a relatively low share of women in digital jobs, as the Women in Digital Scoreboard (2020) shows, with only 20.4% of ICT specialists being women. Further strengthening the participation in adult learning will allow Denmark to contribute to reaching the 2030 EU headline target on skills.

Although the share of people at risk of poverty or social exclusion has decreased in recent years, there is potential for further improvement. At 16.8% in 2020, the rate of people at risk of poverty or social exclusion is relatively low compared to the EU average of 21.9%, although certain groups, and in particular young people, migrants and persons with disabilities, face barriers to accessing the labour market and a higher risk of poverty. Through the Fund for European Aid to the Most Deprived (FEAD) and the expected European Social Fund Plus ESF+ programmes, Denmark utilises EU funding to support the most deprived, focusing on measures supporting the homeless and those at risk of homelessness. While the housing cost overburden remains above the EU average (at 14.1% compared to 7.9% in the EU 2020), it is evolving in the right direction.

This Annex outlines the main challenges for Denmark's education and training system in light of the EU-level targets of the European Education Area Strategic Framework and other contextual indicators, based on the analysis from the 2021 Education and Training Monitor. Denmark's education and training system performs well but still has certain equity challenges that could worsen due to the pandemic. Denmark outperforms the EU average and EU-level targets in terms of participation in the early childhood education, in basic skills, early leavers from education and training, and tertiary education.
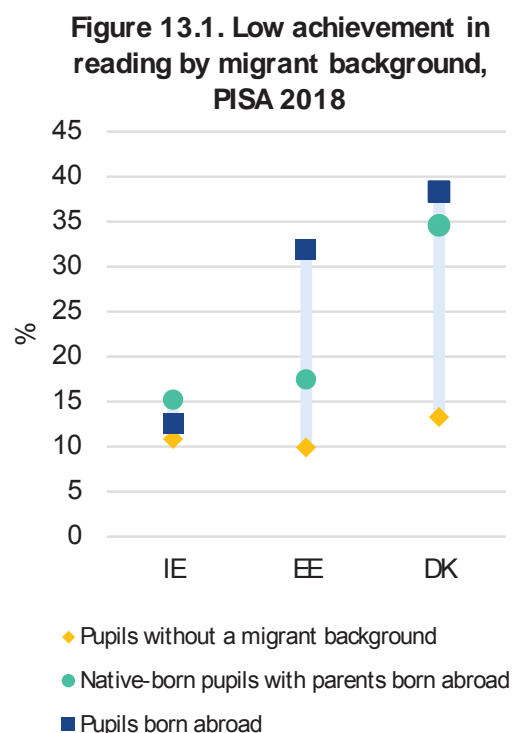
Early school leaving is slightly more frequent in Denmark than on average in the EU, and there is an urban-rural divide. At 9.8%, early school leaving is slightly above the EU level target (9%), and pupils drop out in rural areas more frequently than in cities. In addition, there is a significant gender gap (3.5 pps) in favour of girls. Participation in early childhood education and care is one of the highest in the EU and reforms aim to improve quality of provision.

Educational outcomes and basic skills are good overall, but young people with migrant background lag behind. Parents' socioeconomic backgrounds still influence educational results in Denmark. PISA results show that 15-year old Danish pupils are performing well overall in reading, maths and science (close to the 15% EU level target for the share of low-achievers, and above the EU average). Nevertheless, the share among disadvantaged pupils of low-achievers in reading is 20 pps higher than among their advantaged peers. This represents a significant gap, but is still below the EU average (26.9 pps). The gap between the performance of foreign and native-born pupils is large at 25 pps, and there has been little improvement for second-generation migrants. The government is increasing funding for primary and lower secondary schools (*Folkeskole*) systematically until 2023 to allow municipalities to further improve the quality of education.

Evidence ([46]) shows that teacher policies face major challenges such as teacher shortages

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([46]) OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools (2016), OECD Education Working

and a lack of fully trained teachers. Fewer young people are attracted to initial teacher training programmes, and many drop out during training. 18% of teachers in primary school lack adequate qualification in 2021. Teachers are obliged to participate in continuous professional development. Compared with their peers in other countries they are generally less satisfied with the training available.

Graph A13.1: **Low achievement in reading by migrant background, PISA 2018**

Figure 13.1. Low achievement in reading by migrant background, PISA 2018

♦ Pupils without a migrant background
● Native-born pupils with parents born abroad
■ Pupils born abroad

(1) Comparable EU Member States have been selected
Source: OECD (2019), PISA (2018)

Tertiary attainment has further increased in recent years and has surpassed the EU-level target. Its overall recent increase is in line with the EU trend. Tertiary attainment increased by about a quarter for native born and 0.4 pps for EU-born graduates. The share of EU-born graduates now surpasses that of Danish students by about 12 pps and the EU average by some 19 pps. The high attainment rates for foreign-born students hint at the attractiveness of higher education and of the labour market in Denmark, which can help reduce skills shortages. The recent Danish initiative to decrease the number of courses

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Paper No. 235 (2020), OECD Teacher in Focus 2017/16, AE Analysis 18 procent af lærerne har ikke en læreruddannelse 4/2021.

Table A13.1: **EU-level targets and other contextual indicators under the European Education Area strategic framework**

Indicator		Target	2015 Denmark	2015 EU27	2021 Denmark	2021 EU27
Participation in early childhood education (age 3+)		96%	98.0%	91.9%	97.7% [2019]	92.8% [2019]
Low achieving 15-year-olds in:	Reading	< 15%	15.0%	20.4%	16.0% [2018]	22.5% [2018]
	Mathematics	< 15%	13.6%	22.2%	14.6% [2018]	22.9% [2018]
	Science	< 15%	15.9%	21.1%	18.7% [2018]	22.3% [2018]
Early leavers from education and training (age 18-24)	Total	< 9 %	8.1%	11.0%	9.8%	9.7%
	By gender Men		9.9%	12.5%	11.6%	11.4%
	Women		6.2%	9.4%	8.1%	7.9%
	By degree of urbanisation Cities		5.8%	9.6%	6.2%	8.7%
	Rural areas		11.3%	12.2%	13.2%	10.0%
	Native		8.0%	10.0%	9.7%	8.5%
	By country of birth EU-born		: u	20.7%	: u	21.4%
	Non EU-born		9.5% u	23.4%	13.9% u	21.6%
Tertiary educational attainment (age 25-34)	Total	45%	43.0%	36.5%	49.1%	41.2%
	By gender Men		34.6%	31.2%	40.6%	35.7%
	Women		52.0%	41.8%	57.8%	46.8%
	By degree of urbanisation Cities		57.9%	46.2%	61.8%	51.4%
	Rural areas		26.3%	26.9%	33.4%	29.6%
	Native		41.9%	37.7%	48.5%	42.1%
	By country of birth EU-born		59.7% u	32.7%	60.1%	40.7%
	Non EU-born		44.6% u	27.0%	48.8%	34.7%
Share of school teachers (ISCED 1-3) who are 50 years or over			33.2%	38.3%	32.7% [2019]	38.9% [2019]

The 2018 EU average on PISA reading performance does not include ES; u = low reliability, : = not available; Data is not yet available for the remaining EU-level targets under the European Education Area strategic framework, covering underachievement in digital skills, exposure of vocational educational training graduates to work based learning and participation of adults in learning.
*Source:* Eurostat (UOE, LFS); OECD (PISA)

held in English at Danish universities could reverse this trend.

Especially relevant in light of the ongoing COVID-19 pandemic, resilient healthcare is a prerequisite for a sustainable economy and society. This Annex provides a snapshot of the healthcare sector in Denmark.

Life expectancy has increased more rapidly than the EU average since 2010 and continued to grow slightly in 2020 despite the COVID-19 pandemic (see Graph A14.1**).** Only one other EU Member State (Cyprus) did not signal a drop in life expectancy in 2020. As of 17 April 2022, Denmark reported 0.86 cumulative COVID-19 deaths per 1 000 inhabitants and 478 confirmed cumulative COVID-19 cases per 1000 inhabitants. Mortality rates from treatable causes are well below the EU average, while cancer mortality – although falling in recent years - remains high.

Graph A14.1: **Life expectancy at birth, years**
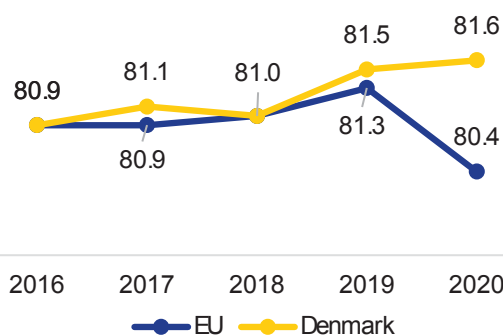
Source: Eurostat database

Graph A14.2: **Projected increase in public expenditure on health care over 2019-2070 (reference scenario)**
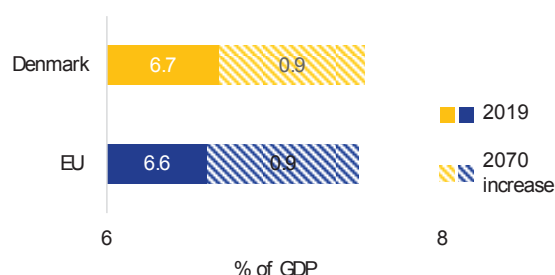
Source: European Commission/EPC (2021)

Health spending relative to GDP was similar to the EU average in 2019. Health spending in real terms, however, grew on average at a rate of 2% per year between 2015 and 2019 – slightly slower than the EU average. Denmark has universal health coverage with mainly public financing (83.3% in 2019). Public

expenditure on health is projected to increase by 0.9 percentage points (pp) of GDP by 2070, the same as for the EU as a whole (see Graph A14.2).

Denmark has more doctors and nurses per capita than the EU average. However, Denmark faces shortages in General Practitioners (GPs), particularly in rural and remote areas. Several government initiatives were taken to increase the supply of GPs and nurses, both before and during the pandemic. In line with policies aimed at shifting care to outpatient settings, hospital capacity has declined steadily over the past two decades. Still, surge capacity during the pandemic was sufficient (at the cost of suspending non-urgent care and elective surgery).

Through its Recovery and Resilience Plan (RRP), Denmark plans to invest EUR 33 million (2% of the total RRP) to boost digitalisation in the healthcare system, through the further rollout of telemedicine. The Danish plan will also help underpin a management system for stocks of critical medical supplies and study the effects and side effects of COVID-19 vaccines.

Table A14.1: **Key health indicators**

	2016	2017	2018	2019	2020	EU average (latest year)
Treatable mortality per 100 000 population (mortality avoidable through optimal quality healthcare)	76.0	73.2	73.0	66.6		92.1 (2017)
Cancer mortality per 100 000 population	293.6	284.7	279.8	282.5		252.5 (2017)
Current expenditure on health, % GDP	10.1	10.0	10.1	10.0		9.9 (2019)
Public share of health expenditure, % of current health expenditure	84.1	84.0	83.9	83.3		79.5 (2018)
Spending on prevention, % of current health expenditure	2.6	2.5	2.4	2.5		2.8 (2018)
Acute care beds per 100 000 population	252.5	253.6	254.0	249.0		387.4 (2019)
Doctors per 1 000 population *	4.0	4.1	4.2			3.8 (2018)
Nurses per 1 000 population *	9.9	10.0	10.1			8.2 (2018)
Consumption of antibacterials for systemic use in the community, daily defined dose per 1 000 inhabitants per day **	15.2	14.3	13.6	13.4	12.5	14.5 (2020)

Doctors' density data refer to practising doctors in all countries except FI, EL, PT (licensed to practice) and SK (professionally active). Nurses' density data refer to practising nurses in all countries (imputation from year 2014 for FI) except IE, FR, PT, SK (professionally active) and EL (nurses working in hospitals only). More information: https://ec.europa.eu/health/state-health-eu/country-health-profiles_en
Source: Eurostat Database; except: * Eurostat Database and OECD, ** ECDC.

The regional dimension is an important factor when assessing economic and social developments in Member States. Taking into account this dimension enables a well-calibrated and targeted policy response that fosters cohesion and ensures sustainable and resilient economic development across all regions. Regional economic disparities in Denmark increased in 2000-19. The Capital region is the engine of the Danish economy. Three other regions, South Denmark, Central Jutland and North Jutland follow with GDP above the EU average. Only Zealand is below the EU average in GDP terms and is defined as a transition region for cohesion policy funding. While the Capital region accounted for over 40.6% of national GDP in 2019 and has a lead in GDP growth, North Jutland has the slowest GDP growth rate per head (0.9%), below the EU average (1.39%) (see Graph A15.1).

Graph A15.1: **GDP per head (2010) and GDP growth (2010-2019)**
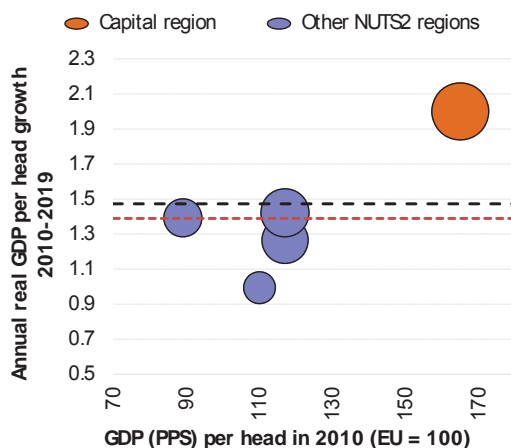
Bubble sizes correspond to population size.
Source: European Commission

The general labour market conditions show hardly any differences between regions. Only in high-tech and knowledge intensive sectors does the Capital region largely outperforms other regions. Labour productivity was above the EU average for all regions, but the gap between the capital and the rest of the country increased during this period (see Graph A15.2).

Graph A15.2: **Evolution of labour productivity across Danish regions**
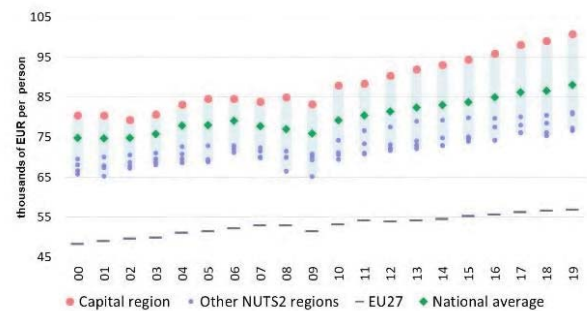
Real GVA in EUR (2015 prices) by employment in thousands of persons.
Source: European Commission

There are disparities in innovative capacity across the regions. The capital region stands out in terms of R&D expenditure, and has the highest share of highly-educated people aged between 30 and 34. Only one other Danish region, Central Jutland, is above the EU average of 2.2% for R&D expenditure. The Capital region and Central Jutland are also innovation leaders in the European Research and Innovation Scoreboard. On the other hand, Zealand and North Jutland are the two regions with the lowest R&D expenditure, whereas Zealand and South Denmark have the least highly educated people.

When it comes to the impacts of the COVID-19 pandemic, slight increases in unemployment rates took place in all regions between 2019 and 2020, but with no major regional differences. However, there was an almost 15% increase in working from home in the Capital region compared to 5-8% on other regions.

Overall, CO2 fossil fuel emissions per person in Denmark are below the EU average. However, Denmark has set very ambitious national targets for the CO2 emissions, which will affect all Danish regions (see Graph A15.3).

Table A15.1: Denmark, selected indicators at regional level

NUTS 2 Region	GDP per head (PPS)	Productivity (GVA (PPS) per person employed)	GDP per head growth	Population with high educational attainment	R&D expenditure	R&D expenditure in the business enterprise sector	Employment in high-technology sectors	Employment in knowledge-intensive services	CO_2 emissions from fossil fuels per head
	EU27=100, 2019	EU27=100, 2018	Avg % change on preceding year, 2010-2019	% of population aged 30-34, 2017-2019	% of GDP, 2017	% of GDP, 2017	% of total employment, 2020	% of total employment, 2020	tCO_2 equivalent, 2018
European Union	100	100	1.39	39.4	2.19	1.5	4.5	40.01	7.2
Danmark	130	113	1.47	48.8	2.98	1.9	5.7	49.24	
Hovedstaden	167	127	2.00	63.2	4.76	3.3	10.0	58.04	3.8
Sjælland	89	101	1.39	33.4	1.41	0.8	4.4	46.57	6.5
Syddanmark	116	105	1.26	38.6	1.75	1.1	2.2	43.11	11.2
Midtjylland	120	104	1.42	46.2	2.46	1.5	4.4	45.47	4.4
Nordjylland	109	100	0.99	40.3	1.60	0.6	3.0	44.35	7.1

Source: Eurostat

Graph A15.3: **CO2 emissions from fossil fuels per person in Danish regions (2018)**
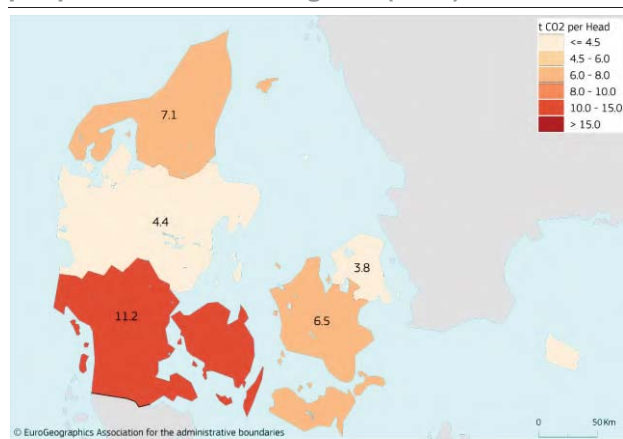
CO2 emissions from fossil fuels per head, 2018 in Denmark   EU-27 = 7.2

Source: European Commission

Graph A15.4: **Territories most affected by the climate transition in Denmark**
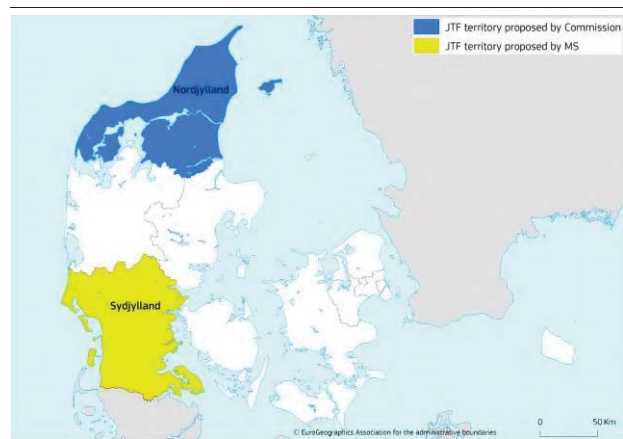
Denmark, Just Transition Fund

Source: European Commission

Although the green transition affects the whole of Denmark, two regions are considered most impacted (see Graph A15.4). South Denmark, and more precisely South Jutland, has a high concentration of the country's oil and gas industry, which is to be phased out by 2050. South Denmark is also the only Danish region with greenhouse gas emissions above EU average. North Jutland, the region with the second-highest greenhouse gas emission intensity in Denmark, has the largest single industrial greenhouse gas emitter in Denmark, the Portland cement factory. Both regions are below the national average in most economic and labour market comparisons, mainly due to the high profile of the capital region as a frontrunner.

This Annex provides an overview of key developments in Denmark's financial sector. The banking sector's solvency has remained quite solid during the pandemic. Danish banks' capital adequacy ratio was not affected by the pandemic and continued to exceed the EU average in Q3 2021 (22.9% vs 19.3%). The stress test conducted by Danmarks Nationalbank shows that while Danish banks have sufficient capital to withstand a severe recession scenario, some of the systemic banks are close to their buffer requirements. At the same time, the non-performing loan ratio remained unchanged for the last three years. As regards profitability, the annualised return-on-equity recovered to 8.1% in Q3 2021 (vs 7.1% in the EU), which could be explained by the low impairment charges. Due to high staff costs, the efficiency of the banks declined in 2020, but recovered in 2021 following increased focus on cost cutting (cost-to-income of 63.3% in 2020 vs 57.7% in Q3 2021). Credit to non-financial corporations increased towards the end of 2021, driven mainly by the end of government liquidity support schemes, while demand for mortgages continued to rise, although at a more moderate pace than house prices.

The residential real estate market exhibits risks that could be addressed by further macroprudential policy measures. The European Systemic Risk Board (2022) ([47]) has identified a number of key vulnerabilities: high house price growth, signs of house price overvaluation, high household indebtedness, large (and increasing) share of loans with deferred amortisation of outstanding loans, significant interconnectedness with the Nordic banking system. House prices have risen steadily in the last two years and their overvaluation was estimated on average at 16% in 2020. House price increases have slowed significantly since mid-2021 and overall mortgage lending growth remained moderate. However, lending to highly indebted homeowners as well as interest-only loans represented increasing shares of new mortgages. In addition, some homeowners have a significant exposure to interest rate risk.

In 2021 the Systemic Risk Council issued several recommendations to reduce the risks in the system and better prepare the financial system for shocks. Accordingly, the Countercyclical Capital Buffer (CCyB) was raised to 1% as of September 2022. It has been decided that it will increase up to 2.5% as of March 2023. However, the Council's recommendation on limiting access to interest-only loans for highly indebted borrowers, capping the loan-to-value ratio at 60%, was not followed by the government, who considered at this stage Danish households are in strong financial position and it is sufficient for now to increase monitoring of the residential real estate market.

Denmark has taken action to address money-laundering risks and approved several measures to strengthen its anti-money laundering (AML) framework, such as transposing the 4th and 5th AML Directives. The Financial Supervisory Authority and the Financial Intelligence Unit have been strengthened by increasing their budget and adding staff. Procedures applying the risk-based approach, adequate training and qualifications for new staff and better cooperation between relevant Danish and international AML authorities are currently being implemented. However, no evidence has yet been provided of the effectiveness of the recently adopted legislative and reforms.

([47]) ESRB, Vulnerabilities in the residential real estate sectors of the EEA countries, February 2022, https://www.esrb.europa.eu/news/pr/date/2022/html/esrb.pr220211~9393d5e991.en.html.

Table A16.1: **Financial soundness indicators**

	2017	2018	2019	2020	2021
Total assets of the banking sector (% of GDP)	363.0	349.4	383.4	401.0	378.5
Share (total assets) of the five largest bank (%)	65.7	64.5	66.2	67.1	-
Share (total assets) of domestic credit institutions (%)[1]	93.0	93.0	92.9	93.4	93.1
Financial soundness indicators:[1]					
- non-performing loans (% of total loans)	2.5	2.3	1.9	1.9	1.9
- capital adequacy ratio (%)	22.1	21.6	22.4	23.2	22.9
- return on equity (%)	10.8	8.0	8.7	4.5	8.1
NFC credit growth (year-on-year % change)	-	-	-	-	-
HH credit growth (year-on-year % change)	-	-	-	-	-
Cost-to-income ratio (%)[1]	51.2	57.7	61.0	63.3	57.6
Loan-to-deposit ratio (%)[1]	228.7	240.7	248.9	215.8	212.6
Central bank liquidity as % of liabilities	0.1	0.1	0.0	0.1	-
Private sector debt (% of GDP)	216.7	215.3	221.0	220.9	-
Long-term interest rate spread versus Bund (basis points)	15.9	5.8	6.8	15.0	31.3
Market funding ratio (%)	44.8	42.4	41.4	40.2	-
Green bond issuance (bn EUR)	1.8	0.8	10.9	1.6	6.8

(1) Last data: Q3 2021
Source: ECB, Eurostat, Refinitiv

This Annex provides an indicator-based overview of Denmark's tax system. It includes information on the tax structure, i.e. the types of tax that Denmark derives most revenue from, the tax burden for workers, and the progressivity and redistributive effect of the tax system. It also provides information on tax collection and compliance and on risks of aggressive tax planning activity.

Denmark's tax revenues are high in relation to GDP, but the tax structure is balanced and relatively growth-friendly. Denmark is a high-tax country with the highest tax-to-GDP ratio of all Member States for 2020. Although Denmark's labour tax revenues as a percentage of GDP in 2020 were among the highest in the EU, this is because of the country's high tax revenues as a share of GDP overall, while the share of labour taxes in total taxation is below the EU aggregate. Similarly, revenues from consumption taxes and environmental taxes as a share of GDP were among the highest in the EU, but this was in part due to the high overall taxation. Yet consumption and environmental tax revenues were also above the EU aggregate as a share of total taxation, indicating Denmark's growth-friendly tax structure. Recurrent taxes on property, which are also highly conducive to economic growth, are strongly used: revenues from recurrent property taxes were among the highest in the EU both as a share of GDP and

as a share of total taxation in 2020. On the other hand, the Danish tax system also allows one of the highest tax deductions for mortgage interest payments in the EU, which incentivises debt financing of residential property. The new property tax system, which would ensure fairer taxation of housing, as endorsed by Parliament back in 2017, is still not in place.

Denmark's labour tax burden is relatively low across the income distribution. The labour tax wedge for Denmark in 2020 was substantially lower than the EU average at various income levels, i.e. for single persons at the average wage (100%) as well as at 50%, 67% and 167% of the average wage. Second earners at a wage level of 67% of the average wage, whose spouse earns the average wage, also face a tax wedge slightly below the EU average, but the difference in their tax wedge compared to single persons at the same wage level is above the EU average. On the other hand, in 2020 the tax-benefit system helped reduce inequality (as measured by the GINI coefficient) by substantially more than the EU average.

Denmark is doing moderately well on digitalisation of the tax administration, which can help reduce tax arrears as well as cut compliance costs. From 2018 to 2019 outstanding tax arrears have increased slightly by 0.4 pp. to 8.4% of total revenue. This is significantly below the EU27 average of 31.8%, though that average is inflated by very large

Table A17.1: **Taxation indicators on taxation**

		Denmark					EU-27				
		2010	2018	2019	2020	2021	2010	2018	2019	2020	2021
Tax structure	Total taxes (including compulsory actual social contributions) (% of GDP)	45.0	44.4	46.8	46.8		37.9	40.1	39.9	40.1	
	Labour taxes (as % of GDP)	22.7	22.9	23.1	24.1		20.0	20.7	20.7	21.5	
	Consumption taxes (as % of GDP)	14.6	14.1	13.6	13.8		10.8	11.1	11.1	10.8	
	Capital taxes (as % of GDP)	7.7	7.4	10.1	8.9		7.1	8.2	8.1	7.9	
	Total property taxes (as % of GDP)	2.5	2.5	2.7	2.6		1.9	2.2	2.2	2.3	
	Recurrent taxes on immovable property (as % of GDP)	2.0	2.0	2.0	2.0		1.1	1.2	1.2	1.2	
	Environmental taxes as % of GDP	4.0	3.6	3.3	3.2		2.4	2.4	2.4	2.2	
Progressivity & fairness	Tax wedge at 50% of Average Wage (Single person) (*)	31.2	30.2	30.4	30.2	30.5	33.9	32.4	32.0	31.5	31.9
	Tax wedge at 100% of Average Wage (Single person) (*)	35.9	35.4	35.5	35.3	35.4	41.0	40.2	40.1	39.9	39.7
	Corporate Income Tax - Effective Average Tax rates (1) (*)		20.3	20.3	20.3			19.8	19.5	19.3	
	Difference in GINI coefficient before and after taxes and cash social transfers (pensions excluded from social transfers)	12.2	11.3	11.4	11.2		8.4	7.9	7.4	8.3	
Tax administration & compliance	Outstanding tax arrears: Total year-end tax debt (including debt considered not collectable) / total revenue (in %) (*)		8.0	8.4				31.9	31.8		
	VAT Gap (% of VTTL)		7.9	8.6				11.2	10.5		
Financial Activity Risk	Dividends, Interests and Royalties (paid and received) as a share of GDP (%)		6.1	6.2	6.5			10.7	10.5		
	FDI flows through SPEs (Special Purpose Entities), % of total FDI flows (in and out)		16.2	6.7	5.5			47.8	46.2	36.7	

(1) Forward-looking effective tax rate (OECD).
(*) EU-27 simple average as there is no aggregated EU-27 value.
Source: European Commission, OECD

Tax wedge 2021 (%)
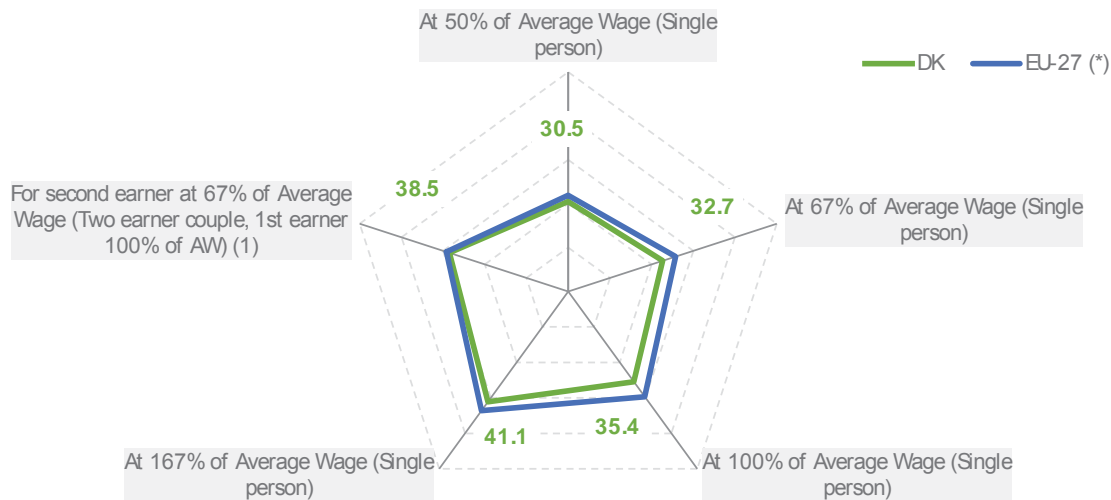
The tax wedge measures the difference between the total labour cost of employing a worker and the worker's net earnings: sum of personal income taxes and employee and employer social security contributions, net of family allowances, expressed as a percentage of total labour costs (the sum of the gross wage and social security contributions paid by the employer).
(1) The second earner average tax wedge measures how much extra personal income tax (PIT) plus employee and employer social security contributions (SSCs) the family will have to pay as a result of the second earner entering employment, as a proportion of the second earner's gross earnings plus the employer SSCs due on the second earner's income. For a more detailed discussion see OECD (2016), Taxing Wages 2016, OECD Publishing, Paris.
http://dx.doi.org/10.1787/tax_wages-2016-en
(*) EU-27 simple average, as no aggregated EU-27 value
Source: European Commission

values in a few Member States. The VAT gap (an indicator of the effectiveness of VAT enforcement and compliance) has remained relatively stable in Denmark at 8.6%, below the EU-wide gap of 10.5%. It is positive that the new IT system PSRM doubled debt collection from DKK 1.6 billion in 2020 to DKK 3.7 billion in 2021. ([48])

([48]) https://www.gaeldst.dk/nyheder/nyt-system-inddriver-dobbelt-saa-meget-af-danskernes-gaeld-til-det-offentlige/

Table A18.1: **Key economic and financial indicators**

	2004-07	2008-12	2013-18	2019	2020	2021	forecast 2022	forecast 2023
Real GDP (y-o-y)	2.5	-0.4	2.2	2.1	-2.1	4.7	2.6	1.8
Potential growth (y-o-y)	1.5	1.0	1.7	1.9	1.8	2.4	2.3	2.1
Private consumption (y-o-y)	3.3	-0.3	1.9	1.2	-1.3	4.2	2.3	2.1
Public consumption (y-o-y)	1.6	1.6	0.8	1.5	-1.7	3.7	1.4	0.6
Gross fixed capital formation (y-o-y)	5.8	-3.6	4.6	0.1	5.1	5.6	2.7	2.3
Exports of goods and services (y-o-y)	6.2	1.0	3.4	5.0	-7.0	7.8	5.4	4.5
Imports of goods and services (y-o-y)	9.5	0.5	3.8	3.0	-4.1	8.2	5.0	4.6
Contribution to GDP growth:								
Domestic demand (y-o-y)	3.2	-0.5	2.0	1.0	0.1	4.1	2.0	1.7
Inventories (y-o-y)	0.3	-0.2	0.1	-0.2	-0.1	0.3	0.1	0.0
Net exports (y-o-y)	-1.0	0.3	0.0	1.4	-2.0	0.3	0.5	0.2
Contribution to potential GDP growth:								
Total Labour (hours) (y-o-y)	0.2	-0.1	0.2	0.3	0.3	0.8	0.7	0.5
Capital accumulation (y-o-y)	0.8	0.3	0.5	0.7	0.8	0.9	0.9	0.9
Total factor productivity (y-o-y)	0.6	0.9	0.9	0.9	0.7	0.6	0.6	0.6
Output gap	3.3	-2.3	-1.9	-0.3	-4.1	-2.0	-1.6	-1.9
Unemployment rate	4.5	6.7	6.3	5.0	5.6	5.1	4.8	4.7
GDP deflator (y-o-y)	2.4	2.2	0.8	0.7	2.6	2.4	3.3	2.3
Harmonised index of consumer prices (HICP, y-o-y)	1.5	2.4	0.5	0.7	0.3	1.9	5.1	2.7
Nominal compensation per employee (y-o-y)	3.4	2.6	1.6	1.9	2.3	3.2	3.6	2.9
Labour productivity (real, hours worked, y-o-y)	1.5	0.7	1.5	1.4	0.8	0.4	0.2	0.4
Unit labour costs (ULC, whole economy, y-o-y)	2.3	2.0	0.6	1.2	3.8	1.1	2.8	2.2
Real unit labour costs (y-o-y)	0.0	-0.2	-0.2	0.4	1.1	-1.2	-0.5	-0.1
Real effective exchange rate (ULC, y-o-y)	1.4	-0.7	0.1	-2.2	.	.	.	.
Real effective exchange rate (HICP, y-o-y)	-0.2	-0.7	0.2	-1.7	1.5	-1.0	.	.
Net savings rate of households (net saving as percentage of net disposable income)	-2.7	-0.1	3.4	3.6	5.8	4.9	.	.
Private credit flow, consolidated (% of GDP)	17.5	5.3	1.6	10.7	4.8	8.8	.	.
Private sector debt, consolidated (% of GDP)	192.3	224.0	216.0	221.0	220.9	212.0	.	.
of which household debt, consolidated (% of GDP)	116.5	136.5	122.3	110.1	111.6	104.5	.	.
of which non-financial corporate debt, consolidated (% of GDP)	74.8	86.8	93.4	110.8	109.2	107.4	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (2)	.	2.9	3.5	1.7	2.0	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	3.6	7.8	6.7	4.8	7.3	6.1	7.2	7.7
Corporations, gross operating surplus (% of GDP)	22.7	22.3	24.3	24.4	24.9	25.6	26.2	26.5
Households, net lending (+) or net borrowing (-) (% of GDP)	-4.8	-1.0	1.0	0.0	1.0	-0.1	-0.2	-0.4
Deflated house price index (y-o-y)	11.1	-6.0	4.2	1.6	4.6	.	.	.
Residential investment (% of GDP)	6.2	4.3	4.2	5.0	5.5	5.6	.	.
Current account balance (% of GDP), balance of payments	3.0	5.2	8.0	8.8	8.1	8.3	7.8	7.7
Trade balance (% of GDP), balance of payments	4.2	5.5	6.7	7.4	6.5	6.7	.	.
Terms of trade of goods and services (y-o-y)	0.4	0.6	0.3	-0.1	2.2	-0.2	-1.5	0.0
Capital account balance (% of GDP)	0.1	0.1	-0.1	0.0	0.0	0.1	.	.
Net international investment position (% of GDP)	-0.8	14.5	47.2	77.5	68.8	75.6	.	.
NENDI - NIIP excluding non-defaultable instruments (% of GDP) (1)	-25.6	-18.5	11.2	28.9	30.0	31.6	.	.
IIP liabilities excluding non-defaultable instruments (% of GDP) (1)	139.7	163.7	163.0	163.8	184.7	165.2	.	.
Export performance vs. advanced countries (% change over 5 years)	3.2	-1.5	-6.7	1.1	12.0	.	.	.
Export market share, goods and services (y-o-y)	-1.6	-3.8	0.3	3.4	6.3	-1.9	0.7	0.2
Net FDI flows (% of GDP)	1.8	2.1	1.5	2.9	2.1	4.6	.	.
General government balance (% of GDP)	4.3	-1.6	0.2	4.1	-0.2	2.3	0.9	0.6
Structural budget balance (% of GDP)	.	.	0.3	4.3	2.3	3.5	1.9	2.2
General government gross debt (% of GDP)	35.1	41.4	39.2	33.6	42.1	36.7	34.9	33.9

(1) NIIP excluding direct investment and portfolio equity shares.
(2) Domestic banking groups and stand-alone banks, EU and non-EU foreign-controlled subsidiaries and EU and non-EU foreign-controlled branches.
Source: Eurostat and ECB as of 2022-05-02, where available; European Commission for forecast figures (Spring forecast 2022)

This annex assesses fiscal sustainability risks for Denmark over the short, medium and long term. It follows the same multi-dimensional approach as the 2021 Fiscal Sustainability Report, updated on the basis of the Commission 2022 spring forecast.

Table 1 presents the baseline debt projections. It shows the projected government debt and its breakdown into the primary balance, the snowball effect (the combined impact of interest payments and nominal GDP growth on the debt dynamics) and the stock-flow adjustment. These projections assume that no new fiscal policy measures are taken after 2023, and include the expected positive impact of investments under Next Generation EU.

Graph 1 shows four alternative scenarios around the baseline, to illustrate the impact of changes in assumptions. The 'historical SPB' scenario assumes that the structural primary balance (SPB) gradually returns to its

past average level. In the 'lower SPB' scenario, the SPB is permanently weaker than in the baseline. The 'adverse interest-growth rate' scenario assumes a less favourable snowball effect than in the baseline. In the 'financial stress' scenario, the country temporarily faces higher market interest rates in 2022.

Graph 2 shows the outcome of the stochastic projections. These projections show the impact on debt of 2 000 different shocks affecting the government's budgetary position, economic growth, interest rates and exchange rates. The cone covers 80% of all the simulated debt paths, therefore excluding tail events.

Table 2 shows the S1 and S2 fiscal sustainability indicators and their main drivers. S1 measures the consolidation effort needed to bring debt to 60% of GDP in 15 years. S2 measures the consolidation effort required to stabilise debt over an infinite horizon. The *initial budgetary position* measures the effort required to cover future interest payments, the *ageing costs* component

Table A19.1: **Debt sustainability analysis for Denmark**

Table 1. Baseline debt projections	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Gross debt ratio (% of GDP)	**33.6**	**42.1**	**36.7**	**34.9**	**33.9**	**31.1**	**28.0**	**24.8**	**22.0**	**19.4**	**16.9**	**14.4**	**11.9**	**9.7**
Change in debt	-0.4	8.5	-5.4	-1.8	-1.0	-2.8	-3.1	-3.2	-2.8	-2.6	-2.5	-2.5	-2.4	-2.2
of which														
Primary deficit	-4.8	-0.4	-2.9	-1.5	-1.1	-1.9	-2.2	-2.5	-2.3	-2.2	-2.1	-2.1	-2.1	-2.0
Snowball effect	-0.2	0.4	-2.3	-1.5	-0.9	-1.0	-0.9	-0.7	-0.5	-0.4	-0.5	-0.4	-0.3	-0.3
Stock-flow adjustment	4.6	8.5	-0.2	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross financing needs (% of GDP)	6.4	14.6	4.7	6.9	6.7	4.7	3.3	2.1	1.3	0.7	0.3	-0.2	-0.5	-0.6

Graph 1. Deterministic debt projections (% of GDP)

Baseline — Historical SPB scenario — Lower SPB scenario — Financial stress scenario — Adverse 'r-g' scenario

Graph 2. Stochastic debt projections (% of GDP)

p80-p90, p60-p80, p40-p60, p20-p40, p10-p20 — Median — Baseline
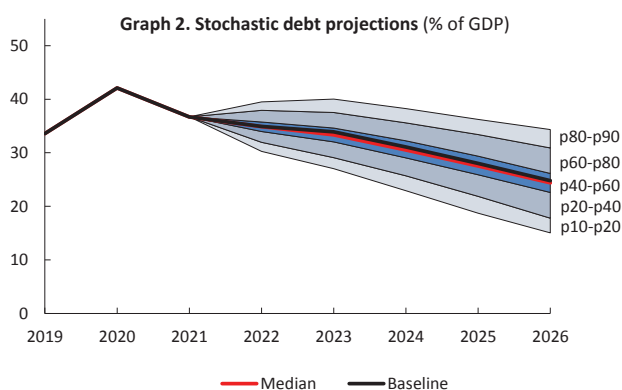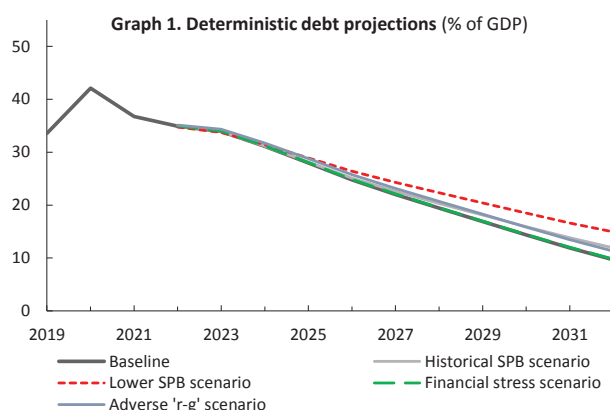
Table 2. Breakdown of the S1 and S2 sustainability gap indicators

		S1	S2
Overall index (pps. of GDP)		**-5.9**	**-0.8**
of which			
Initial budgetary position		-4.7	-2.6
Debt requirement		-2.0	
Ageing costs		0.8	1.8
of which	*Pensions*	-0.3	-1.5
	Health care	0.2	0.7
	Long-term care	1.0	3.0
	Others	-0.1	-0.4

Source: European Commission

Table A19.2: **Heatmap of fiscal sustainability risks for Denmark**

Short term	Medium term										Long term	
				Debt sustainability analysis (DSA)								
					Deterministic scenarios							
Overall (S0)	Overall (S1+DSA)	S1	Overall		Baseline	Historical SPB	Lower SPB	Adverse 'r-g'	Financial stress	Stochastic projections	S2	Overall (S2+DSA)
LOW	LOW	LOW	LOW	Overall	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
				Debt level (2032), % GDP	10	12	15	11	10			
				Debt peak year	2021	2021	2021	2021	2021			
				Fiscal consolidation space	64%	68%	73%	64%	64%			
				Probability of debt ratio exceeding in 2026 its 2021 level						6%		
				Difference between 90th and 10th percentiles (pps. GDP)						19		

(1) *Debt level* in 2032: green: below 60% of GDP, yellow: between 60% and 90%, red: above 90%. (2) The *debt peak year* indicates whether debt is projected to increase overall over the next decade. Green: debt peaks early; yellow: peak towards the middle of the projection period; red: late peak. (3) *Fiscal consolidation space* measures the share of past fiscal positions in the country that were more stringent than the one assumed in the baseline. Green: high value, i.e. the assumed fiscal position is plausible by historical standards and leaves room for corrective measures if needed; yellow: intermediate; red: low. (4) *Probability of the debt ratio exceeding in 2026 its 2021 level*: green: low probability, yellow: intermediate, red: high (also reflecting the initial debt level). (5) The *difference between the 90th and 10th percentiles* measures uncertainty, based on the debt distribution under 2000 different shocks. Green, yellow and red cells indicate increasing uncertainty.

Source: European Commission (for further details on the Commission's multi-dimensional approach, see the 2021 Fiscal Sustainability Report).

accounts for the need to absorb the projected change in ageing-related public expenditure such as pensions, health care and long-term care, and the *debt requirement* measures the additional adjustment needed to reach the 60% of GDP debt target.

Finally, the heat map presents the overall fiscal sustainability risk classification (Table A19.2)**.** The *short-term risk category* is based on the S0 indicator, an early-detection indicator of fiscal stress in the upcoming year. The *medium-term risk category* is derived from the debt sustainability analysis (DSA) and the S1 indicator. The DSA assesses risks to sustainability based on several criteria: the projected debt level in 10 years' time, the debt trajectory ('peak year'), the plausibility of fiscal assumptions and room for tighter positions if needed ('fiscal consolidation space'), the probability of debt not stabilising in the next 5 years and the size of uncertainty. The *long-term risk category* is based on the S2 indicator and the DSA.

Overall, short-term risks to fiscal sustainability are low. The Commission's early-detection indicator (S0) does not signal short-term fiscal risks (Table A19.2).

Medium-term risks to fiscal sustainability are low. Both elements of the Commission's medium-term analysis lead to this conclusion. First, the debt sustainability analysis (DSA) shows that government debt is projected to continue falling significantly from around 35% of GDP in 2022 to around 10% of GDP in 2032

in the baseline (Table 1). This debt path is robust to possible shocks to fiscal, macroeconomic and financial variables, as illustrated by alternative scenarios and stochastic simulations, all pointing to low risks (Graphs 1 and 2). Moreover, the sustainability gap indicator S1 (at -5.9 pps. of GDP) signals that the country has significant room to reduce its primary surplus, without breaching the 60% of GDP reference target (Table 2). Overall, the low risk reflects the current surplus and low debt, despite the projected ageing costs increase, primarily related to long-term care.

Long-term risks to fiscal sustainability are low. Over the long term, both the sustainability gap indicator S2 (at -0.8 pps. of GDP) and the DSA point to low risks. The S2 indicator suggests that, to stabilise debt over the long term, the current budgetary position would not need to improve and that there is some room to address future budgetary pressures stemming from population ageing, in particular related to long-term care and health-care expenditure (Table 2).