Bilag 8 / Annex 8

Til

Ajourføring af Danmarks
nationale energi- og klimaplan
for perioden 2021-2030

Juni 2024

Contents

4 Policies and measures

- including those in accordance with Article 2 of the Kyoto Protocol, and domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures

4.1 CLIMATE POLICY AND THE POLICY-MAKING PROCESS

Since the Brundtland Commission's report, "Our Common Future", from 1987, Denmark's climate policy has developed in collaboration with the different sectors of society, and in line with international climate policy, and results from related scientific research.

Thus, since the end of the 1980s a considerable number of measures to reduce emissions of greenhouse gases have been implemented.

Some of the measures have been implemented with reduction of greenhouse gas emissions as the main objective, others were aimed at achieving environmental improvements for society in general, e.g. by introducing environmental taxes and involving the public in the debate and decisions concerning the environment.

Since 2001, focus has also been on efforts to reduce emissions and meet the near-term international greenhouse gas emission reduction targets – i.e. for 2008-2012 under the first commitment period of the Kyoto Protocol and the EU Burden Sharing, for 2013-2020 under the second commitment period of the Kyoto Protocol and the EU Effort Sharing Decision and for 2021-2030 under the Paris Agreement and the EU burden sharing of the EU National Determined Contribution through the EU Effort Sharing Regulation – with view to meet the long-term EU target: a climate-neutral society by 2050.

Denmark's international climate targets are described in Box 4.1.

BOX 4.1 INTERNATIONAL CLIMATE TARGETS

Since 1990 Denmark has undertaken or committed itself to several targets with respect to reducing greenhouse gas emissions:

- In accordance with the Climate Convention, to reduce total emissions of greenhouse gases in Denmark, Greenland and the Faroe Islands to the 1990 level by 2000. This target was achieved for total emissions excluding the land-use sector (LULUCF). Due to windfalls total emissions including LULUCF brought the Realm to within 1% of the target.
- As a contribution to stabilisation in the EU, Denmark committed itself to reducing CO_2 emissions in 2000 by 5% compared to the adjusted level for 1990. This target was fulfilled.
- In relation to the Kyoto Protocol, for the period 2008-2012 the EU committed itself to reducing emissions of greenhouse gases on average to 8% below the level in the base year; 1990 for CO_2, methane, and nitrous oxide and either 1990 or 1995 for industrial greenhouse gases. Denmark committed itself to a reduction of 21% as an element of the burden-sharing agreement within the EU. Both Denmark and the EU reached these targets for 2008-2012.
- In relation to the period 2013-2020, the EU reached an agreement in December 2008 on a climate and energy package and on a regulation on CO_2 from new vehicles. According to this package the EU was committed to reduce its overall emissions to at least 20% below 1990 levels by 2020. Under the EU burden sharing of the joint EU target for 2020, Denmark was committed to a reduction in non-ETS emissions in the period 2013-2020, rising to 20% by 2020 relative to 2005. The EU was also committed to reduce its ETS emissions to 21% below 2005 levels by 2020. The EU had also set itself a target of increasing the share of renewables in energy use to 20% by 2020. Under burden sharing of this EU target, Denmark was committed to reach a 30% share of renewables in energy use by 2020. Both Denmark and the EU reached these targets for 2013-2020.
- In relation to the period 2021-2030, the European Council agreed on the first 2030 climate and energy framework in October 2014. The first agreement on the 2030 framework, specifically the EU domestic greenhouse gas reduction target of at least 40%, formed the basis of the EU's contribution to the Paris Agreement. The EU's first so-called Intended Nationally Determined Contribution (INDC) was formally approved at an Environment Council meeting in March 2015. In May 2018 the EU member states reached the first agreement on the effort sharing for the period 2021-2030, where Denmark committed itself to a reduction in non-ETS emissions in the period 2021-2030 of 39% by 2030 relative to 2005. However, in June 2022, and as an implementation of the updated NDC submitted by the EU in December 2020 with a more ambitious EU domestic greenhouse gas reduction target of at least 55% by 2030 relative to 1990, Denmark committed itself to a reduction in non-ETS emissions in the period 2021-2030 of 50% by 2030 relative to 2005. The last two pillars in the necessary EU legislation for this so-called "Fit for 55"-package was adopted in October 2023. According to this package, the EU is also committed to reducing its ETS emissions to achieve the 55% below 1990 levels by 2030 in total greenhouse gas emissions. The EU has also set itself the target of increasing the share of renewables in energy use to 42.5-45% by 2030. Denmark's contribution to the EU's joint renewable energy target is under clarification. In addition to this total RES target, Denmark has a number of specific RES targets in different sectors according to the EU legislation. When it comes to energy efficiency Denmark has an obligation under the EU Energy Efficiency Directive to ensure that Denmark's final energy consumption will not exceed 575 PJ in 2030.

The following sections contain more information about Denmark's climate relevant action plans until now and the climate policy framework until 2030.

This section is followed by sector by sector descriptions of Denmark's climate policies and measures.

4.1.1 National action plans

In 1988 the government issued the Government's Action Plan for Environment and Development. The plan was a follow-up on the Brundtland Report and was based in principle on striving for environmentally sustainable development. One of the main messages in the plan was the need to integrate environmental considerations into decisions and administration within such sectors as transport, agriculture and energy.

In the years since then, a number of ministries have prepared sector action plans in which the environment is an integral element. The sector action plans deal with the

entire development in a sector combined with solutions to environmental problems caused by the sector. The sector plans for energy, transport, forestry, agriculture, the aquatic environment, waste, and development assistance are important examples.

The plans from the 1990s all contained specific environmental objectives and, usually, deadlines for achieving them. In addition, there were a number of concrete initiatives that are intended to lead to achievement of the objectives. Progress has been evaluated regularly to check whether the implementation of the plans resulted in achievement of the objectives. The results of the evaluations have been presented in political reports from the sector ministries or in special follow-up reports.

The evaluations and follow-up have often given rise to the preparation of new action plans, either because additional initiatives have been necessary in order to achieve the objectives or because the development of society or developments within the area in question have made it necessary to change both objectives and initiatives. Major sector plans, strategies and agreements that have been of importance for the reduction of greenhouse gas emissions are:

- The NPO Action Plan on pollution from livestock manure (1985)
- Action Plan for the Aquatic Environment I (1987)
- Energy 2000 (1990)
- Action plan for sustainable development in the agricultural sector (1991)
- Strategy for sustainable forest management (1994)
- Strategy 2000 - Danish strategy in the development assistance area (1995)
- Energy 21 (1996)
- Action plan for reduction of the transport sector's CO_2 emissions (1996)
- National sub-strategy for Danish environmental and energy research (1996)
- Action Plan for the Aquatic Environment II (1998)
- Action Plan II - Ecology in Development (1999)
- Waste 21 (1999)
- Action plan for reduction of industrial greenhouse gas emissions (2000)
- Reduction of the transport sector's CO_2 emissions - possibilities, policies and measures (2000)
- Reduction of the transport sector's CO_2 emissions - the government's action plan (2001)
- Denmark's national forest programme (2002)
- Denmark's National Strategy for Sustainable Development (2002)
- National Climate Strategy for Denmark (2003)
- Waste Strategy 2005-2008 (2003)
- Action Plan for the Aquatic Environment III (2004)
- 1st National Allocation Plan 2005-2007 under the EU-ETS (2004)
- Energy Strategy 2025 (2005)
- Action Plan for Strengthened Energy-saving Efforts (2005)
- 2nd National Allocation Plan 2008-2012 under the EU-ETS (2007)
- Political agreement on Energy (2008)
- Political agreement on a Green Transport Vision for Denmark (2009)
- Political agreement on a Tax Reform (2009)
- Growth with Consideration – the government's strategy for sustainable development (2009)
- Strategy for reducing energy consumption in buildings (2009)
- Political agreement on a Green Growth Plan (2009)
- Waste Strategy 2009-2012 – Part I (2009)
- Waste Strategy 2009-2012 – Part II (2010)

- Energy Strategy 2050 (2011)
- Our Future Energy (2011)
- Political Agreement on Energy (2012)
- The Danish Climate Policy Plan – Towards a low carbon society (2013)
- The Agricultural Package (2016)
- The Energy Agreement (2018)
- Denmark's national forest programme (2018)
- The Climate and Air proposal "Together for a greener future" (2018)
- The political understanding "A fair direction for Denmark" (2019)
- Political agreement on a new Climate Act (2019)
- The Government's Climate Plan (May, 2020),
- Political Climate Agreement on Energy and Industy etc. 2020 (June, 2020)
- The Climate Plan for a Green Waste Sector and Circular Economy (June, 2020)
- The Danish Climate Act (June, 2020)
- The Government's Climate Programme 2020 and long-term strategy (Sep.2020)
- The Government's Climate Strategy (December, 2020)
- The Government's Climate Programme 2021 (September, 2021)
- Political agreement on a Green Transition of The Agricultural Sector (October, 2021)
- Political agreement on a Green Tax Reform (June, 2022)
- Political agreement on a new Green Fund in support of the green transition and the phasing out of fossil fuels (June, 2022)
- Political agreement on Expansion of Renewable Energy in electricity and heat supply and demand (June, 2022)
- The Government's Climate Programme 2022 (September, 2022)
- The Government Platform (December, 2022)
- The Government's Climate Programme 2023 (September, 2023)

The sector plans deal with different aspects of the climate problem. In the energy and transport sectors, the main environmental concern has been the emissions of the greenhouse gas CO_2. The plans in these sectors were therefore to a great extent concerned with reducing CO_2.

The frameworks for the Danish energy sector is to create well-functioning energy markets within frameworks that address climate and environmental concerns and secure cost-effectiveness, security of supply, and efficient use of energy under conditions of a fully liberalised energy sector. Electricity production from Danish power plants is controlled by market forces and traded freely across national borders.

The introduction of CO_2 quota regulation as a common EU instrument has therefore been of absolute importance to Denmark meeting its climate commitments. From 2005, quota regulation through the EU emissions trading scheme (EU ETS) has been the key instrument to ensuring that the Danish energy sector can contribute to the reductions requisite to fulfilling Denmark's climate commitments.

In a historic perspective, several sector plans were not primarily focused on reducing greenhouse gas emissions, in part because the sectors are battling with other major environmental problems. For example, the main concern in the agricultural sector in the 1990s was the pollution of the aquatic environment. In the waste sector focus has been on reducing the volume of waste, and in the industrial sector, reduction of emissions/discharges of harmful substances to the atmosphere/aquatic environment, the use of toxic substances, etc. has been at the center of sectorial efforts in the past.

However, the implementation of most of the sector plans has also resulted in reduction of greenhouse gas emissions. For example, the reduction in nitrogen emissions from the agricultural sector, which is the result of the aquatic environment plans, is at the same time reducing emissions of the greenhouse gas nitrous oxide. The initiatives to reduce waste quantities mean fewer landfill sites and thus less formation and emissions of methane, and the on-going increase in forested area will mean increased removals of CO_2.

In addition, the energy and transport plans meant that changes were made in the energy and transport sectors. The initiatives in the energy sector have resulted in reduced energy consumption despite significant economic growth and, with that, reduced CO_2 emissions.

On the environment policy front, Denmark has participated actively in improving environmental protection in Europe through the EU cooperation and through bilateral environmental assistance to Central and Eastern European countries. On a number of points, the EU's environmental regulation has put Europe ahead of the rest of world environmentally. There are also many examples of EU rules having helped to strengthen environmental protection in Denmark. With the adoption of the Amsterdam Treaty, sustainable development became a main objective for the EU, and integrating environmental considerations in the EU's sector policies became an obligation.

4.1.2 Denmark's climate policy

In 2020, the Danish parliament adopted the Danish Climate Act. With the adoption of the Danish Climate Act, an ambitious direction was set for Danish climate policy and Denmark's climate diplomatic role in the world. Central in the Danish Climate Act are the goals of reducing Danish greenhouse gas emissions by 70 per cent in 2030 compared to the 1990 level, and reaching climate neutrality by 2050 at the latest. The Danish government pursue to advance the climate neutrality target to 2045, and set a target of 110 per cent reduction in 2050 compared to 1990 level.

After the adoption of the Climate Act, more than 75 green agreements have been concluded and over DKK 110 billion has been prioritized to the major climate agreements. This include for example, agreements on a high and more harmonized CO_2e tax for industry etc., a significant expansion of Denmark's renewable energy production and a binding reduction target for the agriculture and forestry sector, which will all contribute significantly to achieving the 70 per cent target.

The green transition takes place taking into account the guiding principles of the Climate Act. One principle is that efforts should take into account that climate challenge is a global problem. Therefore, Denmark should be a pioneering country that can inspire and influence the rest of the world. In addition, Denmark's should achieve its climate targets as cost-effective as possible with a focus on both the long-term green transition, sustainable business development and Danish competitiveness, healthy public finances and employment in support of developing Danish business life. Denmark should also be able to demonstrate that a green transition is possible while maintaining a strong welfare society and ensuring cohesion and social balance.

The government platform *Responsibility for Denmark* from December 2022 emphasizes that it is central to keep pace and ensure a thorough implementation of all of the climate measures agreed on the political level (see Box 4.2). As the targets are met, the government is prepared to set new, ambitious targets.

It is particularly important for Denmark to get independent of fossil fuels as soon as possible, both in light of the need for climate action and in light of the current war in Ukraine. The importance is reinforced by the geopolitical situation and the effect on the prices of electricity and gas in Denmark.

To support implementation at all levels, the government has set up a national energy crisis team (NEKST). NEKST's task is to identify solutions to green challenges, so that the pace can be set to get the green political agreements implemented. NEKST will, among other things, ensure national coordination of the roll-out of green heat, which aims to reduce the consumption of gas as quickly as possible and replace it with green solutions. In addition, NEKST also works to identify barriers to the agreed ambitions for scaling up solar and wind on land and recommend any measures to the government that can accelerate the expansion. NEKST acts operationally and can initiate solutions to the acute green challenges that can be solved immediately. This means that action can be taken quickly – also during NEKST's work. The government's committee for green transition follows the work of NEKST, and can continually ask NEKST new green tasks.

In addition to the significant efforts to counteract climate change, it is also necessary to secure Denmark better against more frequent floods and extreme weather events, already to be expected, unfortunately. The Danish government will therefore also draw up a national climate adaptation plan, which supports that efforts are launched in a timely manner and ensures that efforts are organized as best as possible.

In June 2022, a majority of Parties in the Danish Parliament reached a Climate Agreement on green electricity and heat, which, among other things, aims to ensure framework conditions that can enable a quadrupling of the total electricity production from solar energy and onshore wind towards 2030. In the agreement the parties also agree to enable the tendering of at minimum further 4 gigawatts (GW) of offshore wind for realization by 2030 at the latest, on the condition that the offshore wind does not negatively burden the state's finances over the project period. It is the expectation that the electricity from the offshore wind farms, among other things, can be utilised by Power-to-X (PtX) facilities in Denmark. However, the full potential is far from exhausted. The significant expansion of renewable energy can contribute green power to both direct electricity consumption in Denmark, export to the rest of Europe and green power to the production of green fuels for e.g. planes, ships and heavy transport.

On 30 May 2023, the government (Socialdemokratiet - The Social Democratic Party, Venstre - The Liberal Party of Denmark and Moderaterne – the Moderates) together with Socialistisk Folkeparti - the The Green Left, Liberal Alliance - the Liberal Alliance, Det Konservative Folkeparti - the Conservative People's Party, Enhedslisten – the The Red-Green Alliance, Radikale Venstre - the Danish Social Liberal Party, Dansk Folkeparti - the Danish People's Party and Alternativet - the Alternative signed an additional agreement on tender frameworks for 6 GW of offshore wind and Energy Island Bornholm. While the previous agreements set high ambitions, this agreement establishes the concrete tender framework. The agreement can potentially secure green electricity for 14 million Danish and European households or more, and for the first time, there will be state co-ownership of the 6 GW classic offshore wind farms. For the first time, a number of new access requirements are also being introduced to participate in the tenders, which should help to raise the bar for sustainability and social responsibility compared to previous tenders. The agreement also contributes to the security of energy supply. The establishment of a marine nature fund will i.a. contribute to improving the

knowledge about the environment and nature effects of renewable energy development on the sea and to a cost-effective restoration of marine nature and biodiversity with a view to improving the environmental state of the sea. After the political agreement, the Danish Energy Agency has held consultations with the market about the specific tender conditions. The tenders for 6 GW of offshore wind were launched in April 2024 and the Danish Energy Agency is currently preparing the tender material for the offshore wind tender for Energy Island Bornholm.

In December 2023, the government etablished a green tripartite, which must come up with recommendations and solutions for a green transformation of Danish agriculture, where, among other things, concrete solutions for a climate tax on agriculture are discussed, based on the recommendations of the *Expert Group for a green tax reform*. The tripartite must conclude by June 2024 at the latest, after which the government will present a proposal for a climate tax on agriculture.

BOX 4.2 CLIMATE POLICY STATEMENTS IN THE GOVERNMENT PLATFORM, DECEMBER 2022

"**4. Ambitious Climate Action**

The climate crisis is our generation's biggest challenge.

With this government platform, the government is setting the most ambitious climate targets for Denmark ever.

The world is heading for temperature increases that far exceed the target of the Paris Agreement, and we already feel that the climate is changing.

At the same time, we are in the middle of a nature and biodiversity crisis. Plant and animal species are dying out faster than ever, and the natural challenges are massive and global.

Despite significant efforts to counteract climate change, it is also necessary to further secure Denmark against floods and extreme weather. The government will therefore present a national climate adaptation plan, which supports that the necessary measures are implemented in a timely manner, as well as ensuring that the measures are organized as best as possible.

The government will make the necessary decisions that bring Denmark fully on target with the reduction target for 2025 and 2030. The 70 per cent target will, among other things, be achieved by realizing the agricultural and forestry sector's reduction target corresponding to that agreed in the agricultural agreement from 2021.

It is absolutely central for the government to keep up the pace and ensure a thorough implementation of the many initiatives that have been politically adopted, so that we reach our goal. As the targets are met, the government is prepared to set new, ambitious targets.

It is imperative for both Denmark and Europe to quickly get rid of fossil fuels for security policy reasons – also for the sake of the prices of electricity and heating in Danish households. It is the government's aim that as many households as possible move away from individual gas and oil boilers as quickly as possible, which will contribute to lowering the Danes' expenditure on energy in the coming winters.

In order to support implementation at all levels, the government will therefore set up a national energy crisis staff (NEKST) following the same model as the national operational staff (NOST).

NEKST will, with the involvement of relevant social actors, i.a.:

- Ensure national coordination of the rollout of district heating and other efforts aimed at reducing the consumption of natural gas as quickly as possible and replacing it with renewable energy.
- Identify barriers to the agreed ambitions for scaling up solar and wind on land as well as offshore wind and recommend to the government any measures that can accelerate the expansion.
- Support expansion of the electricity grid in places where there are already challenges with capacity today, and contribute to ensuring that the expansion is at the forefront of electricity consumption and the production of power from renewable energy.

4.1 On target with the 70 per cent target

Denmark must be a green pioneering country that sets and fulfills ambitious climate goals and climate efforts and in this way inspires other countries to follow suit. It is the coupling of action on the green transition and continued economic growth that will make other countries look to Denmark. We must

show the world that it is possible to balance high climate ambitions, competitive business life and social cohesion.

The government will:

- Meet the reduction target for 2025 – and meet the reduction target for 2030.
- Ensure that the greenhouse gas reductions that have been agreed politically are realized in practice.
- If the conditions change, so that the climate projection in 2025 or later shows that the 70 per cent target is not achieved with agreed concrete measures, propose additional concrete measures which ensure that we reach the target.
- Work for ambitious and cost-effective climate and energy regulation in the EU, which can contribute to achieving the 70 per cent target and at the same time make Europe independent of Russian fossil energy.

4.2 New climate targets

With our companies, technologies and knowledge, Denmark has an opportunity and an obligation to promote green solutions in the EU and globally. The government will work for an ambitious 2040 climate target in the EU and continue the work of entering into green strategic partnerships with other countries. The government will continue the authority cooperation with countries around the world on sharing Danish experience from decades of work with green transition.

As we reach the 70 per cent target, it is natural to set new targets that can continuously ensure a high pace at the same time as we increase the focus on the implementation of already decided initiatives.

The government will move forward the goal of climate neutrality to 2045. And set a new goal of 110 per cent reduction in 2050 compared to 1990.

The government will propose an ambitious reduction target for 2035 and assess whether the reduction target in 2030 needs to be adjusted further.

The government wants to raise the ambitions for Denmark's footprint in the world by setting a target for Denmark’s climate effect understood as the international climate effect that results from the Danish export of energy technology and services. A solid professional foundation for the goal must be created in cooperation with Danish businesses before it is dealt with politically.

The government will reduce the climate footprint of public procurement, including the procurement of transport and the construction of public buildings.

The government will examine the consequences of setting a target for the CO_2e footprint for Danish consumption.

4.3 Vision for future Danish food production

Denmark is one of the most intensively cultivated countries in the world. We produce enough food to feed more than twice the amount of people as we are. This is good for the world, and it helps create export income and jobs.

We must produce food products of high quality and in an innovative, sustainable and more climate-friendly way. Danish agriculture is already strong when it comes to green innovation. It is the government's ambition to continue to develop – not dismantle – the Danish food production.

In the coming years, agriculture and the food sector face an ambitious transformation in many areas. Emissions must be significantly reduced, we must better protect our drinking water, have more nature and forest and strengthen ecology as well as the plant-based production. The government notes that the sector itself has high ambitions for the green transition.

The government will present a proposal for a climate tax on agriculture when the Expert Group for a Green tax reform have presented their conclusions. The climate tax must ensure implementation of the development track and fulfillment of the binding reduction target for the agricultural and forestry sector of 55-65 per cent in 2030 compared to 1990. The government will ask the expert committee to present different scenarios to achieve this goal in line with the recommendations presented by the committee in connection with the CO_2e tax on industry. This includes consideration of prevention of the relocation of production, involvement of international experience and the possibility of imposing a CO_2e tax on final consumption as a possible means of action.

The tax must be designed in a way where the sector is supported, so that the sector’s competitiveness is not impaired, and thus jobs are not moved out of the country as a whole. In this way, the implementation will be in line with what was agreed upon by a broad majority of the Danish parliament with the Climate Act from 2020: "The achievement of Denmark's climate targets must be done as cost effectively as

possible, taking into account the long-term green transition, sustainable business development and Danish competitiveness, sound public finances and employment, and that Danish business must be developed and not dismantled."

The reductions must be realised with a focus on moving from development to implementation of the development tracks that have been initiated with the Agreement on Agriculture. Here a total potential for reductions of DKK 5 million tonnes of CO_2e in 2030 was pointed to from brown biorefining, manure and fertilizer management, feed additives, doubling of the ecological area and additional stop of cultivation of organic soils. This potential is on the top of the already agreed upon reductions of approximately 1.9 million tonnes of CO_2e, where the means of action have already been decided with the agreement from 2021. The government will focus on getting these measures implemented as soon as possible.

Thus, investments must be made in the green transition, the food production and its competitive abilities. Danish food production must set an example to be followed in the restructuring of other countries' agriculture, and therefore it must be ensured that production is not just moved out of the country. Hence, the proceeds from the tax must be brought back to agriculture, so that the industry's transformation is supported. The government also wants to use part of the Green Fund on further investments in technology for the green transformation of the agricultural sector.

If we are to succeed in restructuring and developing Danish agriculture, we need to see all the efforts and challenges in conjunction.

The government will therefore set up a partnership with the agricultural sector, the food sector, nature organisations, consumer organisations, and municipalities, which will present a proposal for a comprehensive vision plan for Danish agriculture.

The partnership should present its recommendations at the end of 2023, so that a comprehensive plan of vision for Danish agriculture can be drafted in the first half of 2024. An overall plan of vision must also address all targets for land use in Denmark, including for agriculture, nature, development of renewable energy, etc.

In addition to the need for agreements on new initiatives for the food sector, the government will have focus on the implementation of the Agreement on Agriculture. This includes the stop of cultivation of organic soils, which is not happening fast enough."

"4.5 More Danish forest

The government will present an ambitious forest plan with a goal of establishing 250,000 hectares of new forest in Denmark. Establishment of new forest contributes significantly to achieve climate neutrality and, in the long term, net negative emissions.

The forest plan must ensure the greatest possible synergy and balance between the many purposes with new forest, identify key operators and already existing funds as well as considering different means of action.

This will be done in parallel with the drafting of the Plan of Vision, where, among other things, the focus will be on initiating private afforestation. The Forest Plan and afforestation is financed by the Green Fund, while the aim is to have a contribution as large as possible from private operators and existing grants.

4.6 Increase the expansion of renewable energy and transition away from fossil heating

We must get rid of Russian gas faster and turbocharge the green transition with more renewable energy. The North Sea and the Baltic Sea must be green powerhouses that supply green power to the rest of Europe. Unnecessary bureaucracy and an inappropriate division of tasks must not stand in the way of rapid and efficient expansion of renewable energy.

The government will:

- Shorten the processing time for the establishment of renewable energy so that it is not put on hold due to bureaucracy. In this context, the government will look at whether more flexible models can be established for the development of offshore wind while at the same time ensuring that society receives a fair share of the income from energy extraction on land and at sea - possibly in the form of an updated concession model. The government will also promote cooperation in the North Sea and Baltic Sea regions for a faster and coordinated expansion with the necessary infrastructure to promote the green transition and offshore wind.

- Initiate an analysis of whether the current division of tasks between state authorities, regions and municipalities can be made more efficient, with a view to ensuring a high pace in the development of

renewable energy on land. Here, the government will work to ensure that the state will play an active role in the planning of energy parks as a supplement to the municipal planning of renewable energy projects. The development of the energy parks must be market-driven and handled by private actors.

- The government perceives the future energy system as critical infrastructure. When developing renewable energy and the Danish electricity grid, demands must therefore be made for the safest and most sustainable solutions on the market. Increased sustainability must be ensured in the tenders while observing the principles in the EU's taxonomy for environmental sustainability and the Danish climate objectives, as well as tools such as ESG and life cycle assessments. A particular challenge will be to create safe, stable and sustainable supply chains for the entire green transition from Europe and like-minded countries. The government will therefore engage wholeheartedly in the development of a new European industrial policy with this aim in mind.

- Increase the decoupling pool financed by the Green Fund, so that towards 2030 there are funds to promote Danes' decoupling from the gas grid by lifting the expenditure of approx. DKK 8,000, which the state gas distribution company Evida charges when disconnecting from the grid.

- Ensure a strong focus on energy efficiency in both private homes, businesses and public buildings.

- Initiate an expansion plan for the electricity grid and identify measures to support timely and effective investments in the electricity grid. The government will examine whether there is a need for further measures to utilize the electricity grid more efficiently, including, among other things, via a more flexible electricity consumption. This work is based on the efforts of NEKST and may result in changed grid regulation.

- Establish the partnership 'Together on climate', which will support accelerated climate action across the state, municipalities and regions, civil society and business with an emphasis on citizens.

- Increase the production of biogas so that Denmark can more quickly displace Russian natural gas. Including advancing the agreed tenders as far as possible.

4.7 A greener transport

The government wants to accelerate the development of green transport in Denmark towards 2030.

The government will:

- Look at the effects of the agreement on the green transformation of road transport with a view to making it more efficient in light of technological developments. Here, the possibilities for increasing the ambitions for the number of purely electric cars will be examined.

- Put further action behind the promotion of zero-emission trucks based on the pool for fuel infrastructure for heavy road transport from the Infrastructure Agreement in 2021. It must, for example, promote con-version of fleets and setting up charging stations.

- Introduce a passenger tax on air travel of an average of DKK 100. The generated revenue is used, among other things, on the airports and the surrounding areas, financing of the green domestic route and an increased check for the elderly.

- Make it possible to establish a green domestic route in 2025 and, by 2030 at the latest, fully green domestic flights financed by the passenger tax, as well as increasing the pace of the transformation of heavy transport as well as shipping and aviation, among other things by promoting electrification and green fuels."

4.9 The global climate effort

The government will work to ensure that the EU continues to be at the forefront of international climate agreements. Both when it comes to limiting the global climate footprint of the big emitters and rich countries - also outside their own borders - and about supporting the most vulnerable countries that suffer the greatest losses and damage as a result of global warming.

The government will present a plan for how Denmark can live up to its share of the total obligations in the global climate agreements, especially from COP15 and COP27, regarding financing for the world's poorest countries. It must be investigated how risk-averse public funds can be used as a means of leveraging more private funds.

4.1.2.1 The Danish Climate Act

The Government and Venstre (Liberal Party of Denmark, Dansk Folkeparti (Danish People's Party), Radikale Venstre (the Danish Social-Liberal Party) Socialistisk Folkeparti (Socialist People's Party), Det Konservative Folkeparti (Conservative People's Party) and Alternativet (the Alternative) concluded the Agreement on a Climate Act of 6 December 2019. The agreement is implemented in the Climate Act adopted by the Danish Parliament on 26 June 2020. The Climate Act sets a target of reducing greenhouse gas emissions in Denmark by 70% by 2030 compared to a 1990 baseline. At the same time, the Climate Act sets a long-term target for Denmark to be a climate-neutral society by 2050 at the latest.

The Climate Act targets and guiding principles

The Climate Act mandates the setting of a new national climate target every five years, with a 10-year perspective. This means that a new climate target for 2035 must be set in 2025. At the same time, the Climate Act stipulates that a new climate target must be no less ambitious than the most recently set target. This is in alignment with the "no backsliding" principle of the Paris Agreement. The Agreement on a Climate Act also sets out that in connection with the 2020 climate action plan, the Government must propose an indicative target for 2025. In May 2021, a majority of the parties in the Danish parliament agreed on an indicative target for 2025 of 50-54% reduction compared to the 1990 level, which was formally included in the Climate Act in December 2021.

The green transition of society entails multiple dilemmas and considerations that must be evaluated and prioritised. The parties to the agreement behind the Climate Act agree that the climate effort must adhere to a number of guiding principles, see box 4.3.

The Government's climate policy efforts are based on the framework and requirements defined by the Climate Act. In other words the work – as described in this climate programme – represents an ambitious strategy for achieving the reduction targets in the Climate Act with due consideration of the principles that are also part of the act.

BOX 4.3 GUIDING PRINCIPLES FOR THE CLIMATE EFFORT, CF. THE POLITICAL AGREEMENT OF 6 DECEMBER 2019 ON A NEW DANISH CLIMATE ACT

The climate effort must adhere to a number of guiding principles:

1) The climate challenge is a global problem. Therefore, Denmark must be a leading nation in the international climate effort, a nation that can inspire and influence the rest of the world. Furthermore, Denmark has both a historical and a moral responsibility to take the lead.
2) The realisation of Denmark's climate targets must be as cost effective as possible, taking into account the long-term green transition, sustainable business development and Danish competitiveness, sound public finances and employment, and that Danish business must be developed rather than diminished.
3) Denmark must show that a green transition is possible while maintaining a strong welfare society, where cohesion and social balance are secured.
4) The initiatives to be taken to reduce greenhouse gas emissions must result in real domestic reductions, but it must also be ensured that Danish measures do not simply relocate all of the greenhouse gas emissions out-side of Denmark's borders.

Climate action plans at least once every five years

The Climate Act requires the Government to present a climate action plan with a ten-year perspective, at least once every five years, and, as a minimum, in connection with setting the climate targets.

The first *2020 Climate action plan* was published by the former government in December 2020.

The global dimension of the Climate Act

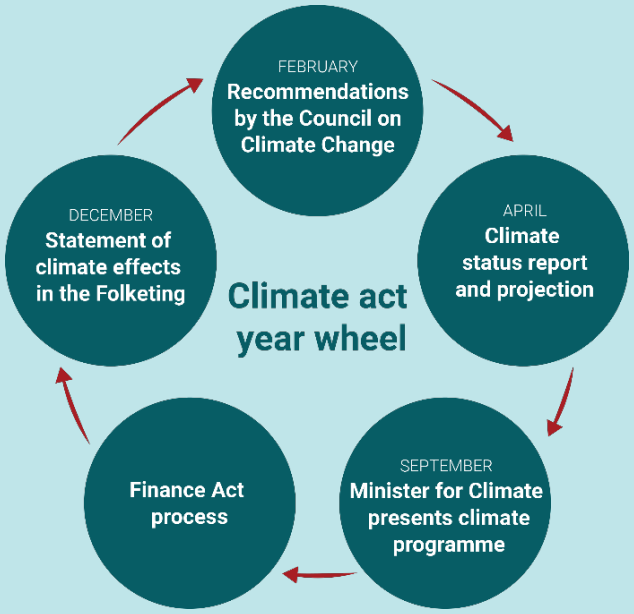
Denmark has an ambition to be a nation that inspire and influence the rest of the world. Accordingly, the Climate Act has an international perspective as well. The act stipulates that Denmark must work actively for realisation of the Paris Agreement target of limiting the global rise in temperature to 1.5 degrees Celsius. The act also requires annual status reporting in the climate programme of Denmark's international obligations and presentation of a global climate strategy and that the annual climate status and projection must contain a separate global report on the international effects of the Danish climate effort.

This includes information about reductions in international shipping and aviation and reductions from export of electricity from renewable sources, and efforts are also made to illustrate the effects of Danish import and consumption. In addition, information the Danish climate finance for developing countries must be included. The purpose of the reporting is to make Denmark's global impact on the climate visible. This will include adverse and positive impacts alike, such as from consumption and specific bilateral country partnerships, respectively, where Denmark helps the countries' energy sectors, etc., in the transition process.

The annual cycle under the Danish Climate Act (the «year wheel»)

The Climate Act gives Denmark a fixed annual cycle for Danish climate policy that obliges the incumbent Government at any time to work to meet the Climate Act targets. The elements in the annual cycle are illustrated and explored in box 4.4. According to the annual cycle, the Danish Council on Climate Change must advise the Government on the climate action.

BOX 4.4 THE ANNUAL CYCLE UNDER THE DANISH CLIMATE ACT



Annual recommendations from the Danish Council on Climate Change
The Council on Climate Change will advise the Government on climate efforts. The Climate Act strengthens this role by requiring the Council to annually assess the Government's climate efforts and make recommendations on the action going forward. In each year's climate programme, the Minister for Climate, Energy and Utilities must report on these recommendations and state the Minister's position on the recommendations. The Council on Climate Change must also assess whether the Government's climate efforts make it probable that the climate targets will be reached.

Climate status and projection
The Minister for Climate, Energy and Utilities presents each year a projection of the Danish greenhouse gas emissions. The climate status and projection provide an overall report on the expected emissions after incorporating the measures decided in the past year and any new knowledge in the form of technological developments, framework conditions or new knowledge of the impact of activities on greenhouse gas emissions. The annual climate status and projection will include a separate global reporting on the international effects of the Danish climate effort.

Climate programme
The Climate Act requires the Minister for Climate, Energy and Utilities to annually present a climate programme to the Danish Parliament, see below on the annual climate programme.

Finance Act process
The climate programme will be presented to the Danish Parliament in September to enable it to be taken into consideration during Finance Act deliberations.

Report to the Danish Parliament
After the annual Finance Act agreement, the Minister for Climate, Energy and Utilities must present a report on the effects of the Government's climate policy and, in this connection, answer questions at an interpellation debate in the Danish Parliament. This enables the Parliament to annually assess whether the Government's initiatives are sufficient for the Parliament to assess that the obligation to act is fulfilled, see below on the annual climate programme.

Climate programme and duty to take action

The Climate Act requires the Minister for Climate, Energy and Utilities to prepare a climate programme for the Danish Parliament each year. In September 2020, the first

- *Climate Programme 2020* - was published by the former government and was thus written before the Climate Act year wheel had turned a full year.

The act makes requirements on the content of the programme to support regular follow-up on the aggregate climate effort in the period until the next sub-target. For instance, the climate programme provides a status report on the fulfilment of Denmark's climate targets and commitments and presents the Government's planned climate initiatives. The climate programme also has a global chapter that sets out the Government's long-term strategy for global climate action with specific initiatives to be launched in the coming year. Box 4.5 illustrates the Climate Act requirements for the contents of the climate programme.

BOX 4.5 THE CLIMATE ACT'S REQUIREMENTS ON THE CONTENT OF THE CLIMATE PROGRAMME

The climate programme must include the following:

1) A status report on fulfilment of the national climate targets
2) The planned climate initiatives and measures, including short- and long-term effect and the projected future effect thereof
3) A report on The Council on Climate Change's recommendations and the position of the Minister for Climate, Energy and Utilities on these recommendations
4) A status report on research and development of new climate initiatives
5) A status report on developments in climate science, including the latest IPCC reports
6) A description and status report on fulfilment of international climate targets
7) A global climate strategy

In addition to these requirements of the climate programme, the Minister for Climate, Energy and Utilities must, in the climate programme, provide an assessment of whether it appears probable that the national climate targets will be reached cf. box 4.6.

BOX 4.6 THE CLIMATE ACT ON DUTY TO TAKE ACTION

The Act features the following elements:

- In the climate programme, the Minister for Climate, Energy and Utilities must provide her/his assessment of whether it appears probable that the national climate targets mentioned in Article 1 will be reached.
- If it cannot be deemed probable that the national climate targets will be reached, in the climate programme the Minister for Climate, Energy and Utilities must present new initiatives with a reduction effect in the shorter term and initiatives with a reduction effect in the longer term, which together chart a path toward fulfilment of the national climate targets.

4.1.2.2 Denmark's climate policy and the EU climate policy

Danish climate policy is based on two pillars – the European and the national.

The EU framework and climate target

The EU determins a large part of the framework conditions, in the form of e.g. objectives, requirements and quota trading system under which the Danish climate effort operates. Common climate regulation in the EU can be to the advantage of

Denmark, as it creates more uniform conditions of competition and export opportunities for Danish companies.

The EU has an overall climate target to lower total CO_2e emissions by at least 55 per cent in 2030 compared to the 1990 level. As a follow-up to the EU's 2030 climate goals, the EU Commission presented the so-called *Fit for 55* legislative package in July 2021, which has since been supplemented with additional EU proposals in December 2021 (the so-called "Winter package"). In October 2023, the European Commission announced that it has adopted two final pillars of the “Fit for 55” legislative package. The *Fit for 55* package has included a historically broad revision of the EU's climate and energy regulation, as well as new regulation within, among other things, transportation.

Fit for the 55 package's importance for Danish fulfillment of the 70 per cent target

The Fit for 55 package is expected to contribute to Denmark's fulfillment of the domestic 70 per cent target, and the proposals in the package are considered to involve significant greenhouse gas reductions. At the same time, there are also proposals that can have significant economical consequences for the state, businesses and households.

A strengthened and expanded ETS will contribute to realizing Denmark's reduction obligations both under the burden-sharing regulation and the domestic 70 per cent target. By sending a price signal, it also supplements existing sector regulation such as CO_2 displacement requirements in the Renewable Energy Directive, the Building Directive and the Energy Efficiency Directive and thus contributes to increased reduction efforts.

4.2 LEGISLATIVE ARRANGEMENTS AND ENFORCEMENT AND ADMINISTRATIVE PROCEDURES

The legal basis for the division of powers into the legislative, executive, and judicial power is the Danish Constitution, *Danmarks Riges Grundlov*[1].

The Constitution includes the legal basis for how the Regent acts on behalf of the Realm in international affairs, and the Regent cannot act without the consent of the Folketing in any way that increases or restricts the area of the Realm, or enter into obligations requiring cooperation of the Folketing or which in some other way are of great significance to the Realm. Neither can the Regent, without the consent of the Folketing, cancel an international agreement entered into with the consent of the Folketing.

After a motion from the government, the Folketing thus gave its consent in 2002, allowing Her Majesty Queen Margrethe the Second, on behalf of the Realm and with territorial reservations for the Faroe Islands, to ratify the Kyoto Protocol. This was on 31 May 2002.

Denmark's implementation of the Kyoto Protocol in the first commitment period 2008-2012 has been effectuated by following up on the national Climate Strategy, sector-policy strategies with climate considerations, and concrete initiatives contributing to limiting or reducing greenhouse gas emissions, and implementation

[1] The Danish Constitution (Danmarks Riges Grundlov) (http://www.retsinfo.dk/_GETDOCI_/ACCN/A19530016930-REGL /: http://www.folketinget.dk/pdf/constitution.pdf)

of the other parts of the Kyoto Protocol. The legislation necessary to do this has been adopted in pursuance of the Constitution regulations concerning legislative powers.

Pursuant to the Constitution, the Regent is the ultimate authority, cf. paragraphs 12-14:

> **"12.** Subject to the limitations laid down in this Constitutional Act, the King shall have supreme authority in all the affairs of the Realm, and shall exercise such supreme authority through the Ministers.
>
> **13.** The King shall not be answerable for his actions; his person shall be sacrosanct. The Ministers shall be responsible for the conduct of government; their responsibility shall be defined by statute.
>
> **14.** The King shall appoint and dismiss the Prime Minister and the other Ministers. He shall decide upon the number of Ministers and upon the distribution of the duties of government among them. The signature of the King to resolutions relating to legislation and government shall make such resolutions valid, provided that the signature of the King is accompanied by the signature or signatures of one or more Ministers. A Minister who has signed a resolution shall be responsible for the resolution."

With this background, the Regent delegates responsibility for various functions to government ministers through Royal resolutions. This makes the various ministers for different areas responsible for, e.g. making proposals for new/amended legislation made necessary by the Kyoto Protocol, enforcement of legislation and initiation of necessary administrative procedures.

The total set of regulations (in Danish) can be accessed via Retsinformation[2] (online legal information system). Legislation concerning measures of importance to Denmark's commitments under the Kyoto Protocol will be enforced pursuant to the current legal basis, including pursuant to any penalty clause. Enforcement could also involve the judicial power.

As regards the institutional arrangements for the implementation the Kyoto Protocol concerning activities in connection with participation in the mechanisms under Articles 6, 12, and 17 of the Kyoto Protocol, these tasks have been delegated to the Danish Energy Agency (DEA) under the Ministry of Energy, Utilities and Climate. The DEA is also responsible for legislation and administration of the EU emission trading scheme. The supplementary regulations regarding the approval and use of JI/CDM credits and the Registry are now regulated in Statutory Order No. 118 dated 28 February 2008 with later amendments (https://www.retsinformation.dk/Forms/R0710.aspx?id=144489).

Among the national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and the elected activities under Article 3, paragraph 4, also contribute to the conservation of biodiversity and sustainable use of natural resources is The Forest Act (Consolidating Act No. 315 of 28 March 2019), and the implementation thereof. Preservation of areas designated as forest reserve land and protection of natural habitats and habitats for species are among the foremost objectives of the Forest Act.

[2] http://www.retsinfo.dk/

Furthermore, activities under Article 3, paragraph 3, and the elected activities under Article 3, paragraph 4 have to be implemented in accordance with Natura 2000, which are the Special Areas of Conservation (SAC) designated according to the European Union's Habitats Directive and the Special Protection Areas (SPA) designated according to the European Union's Birds Directive. The Danish Ramsar Sites are included in the Special Protection Areas.

The Ministry of Environment of Denmark, has the overall responsibility for the implementation of the Habitats Directive and the Birds Directive. The implementation includes the designation of 262 Special Area of Conservation, 113 Special Protection Areas and 28 Ramsar Sites. The rules for administration of the Danish Natura 2000 are laid down in Executive Order No. 1595 of 6 December 2018 on the Designation and Administration of Internationally Protected Sites and the Protection of Certain Species. Similar rules are integrated in other ministries legislation e.g. fisheries and constructions in marine areas.

4.3 POLICIES AND MEASURES AND THEIR EFFECTS

In this section, the individual measures relevant to Denmark's climate policy are described. An overview of Denmark's portfolio of existing (implemented or adopted) climate relevant policies and measures is contained in the main report of the final NECP 2024 Update, where it is also indicated which of the meaures are new and which have expired or been updated etc.

Sections 4.3.1-4.3.4 include descriptions of the cross-sectoral policies and measures, allowance regulation, taxes and duties and carbon capture and storage. Sections 4.3.5-4.3.9 contain descriptions of policies and measures in the following IPCC source/sink and sector categories: Energy (including Transport), Industrial Processes and Product Use, Agriculture, LULUCF (Land-use, Land-use change and Forestry) and Waste.

Table 4.1 shows how the allocation to be used in connection with the annual emission inventories (the CRF/IPCC format) is aggregated into the sectors included in this Chapter on policies and measures.

TABLE 4.1 AGGREGATION OF SOURCE, SINK AND SECTOR CATEGORIES IN THE CRF/IPCC FORMAT INTO THE SECTORS INCLUDED IN THIS CHAPTER

Sectors in this chapter and Chapter 5		Sources/Sectors in the CRF/IPCC format	
Energy - with subsections on:		1.	Fuel combustion activities (1A) and Fugitive emissions from fuels (1B)
	Business	1A2+ 1A4a+ 1A4c.	Manufacturing Industries and Construction Commercial/Institutional Agriculture, Forestry and Fisheries
	Households	1A4b	Residential
	Transport	1A3.	Transport (national)
Industrial Processes and Product Use		2.	Industrial processes and Product Use
Agriculture		3.	Agriculture
LULUCF		4.	Land-use, Land-use Changes and Forestry (LULUCF).
Waste		5.	Waste

Table 4.2a and Figure 4.1 show the main result of this aggregation, including indirect CO_2 emissions, for the historic greenhouse gas inventories in 1990, 2022 as well as the 2024 projections of annual emissions in 2025, 2030, 2035 and 2040 in the "with

existing measures" (WEM) scenario[3] – with and without emissions and removals in connection with land use, land-use change and forestry (LULUCF).

In accordance with the reporting guidelines, the following sector sections in this chapter are subdivided by gas.

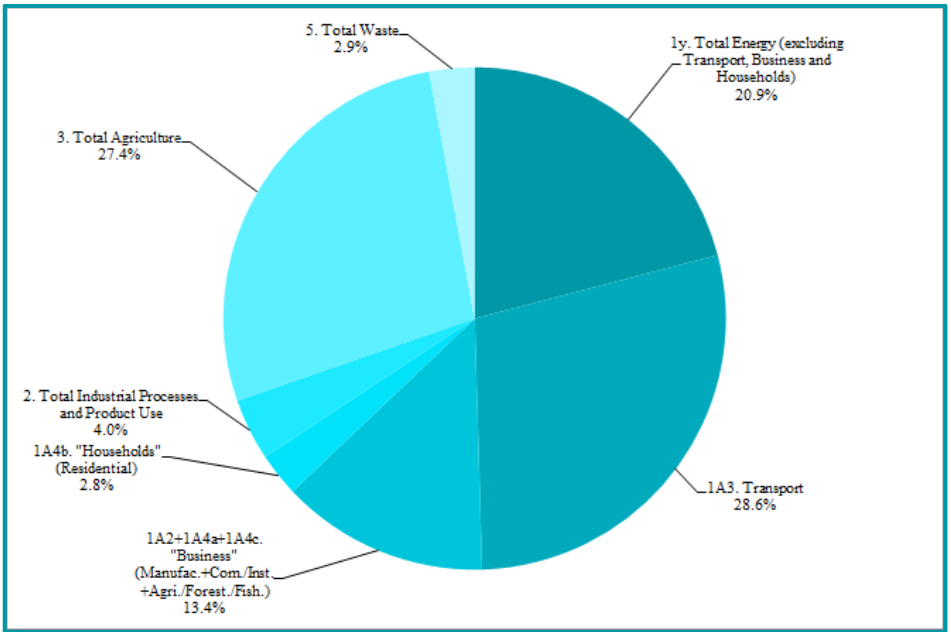
[3] Climate Status and Outlook 2024 (draft April 2024: https://kefm.dk/klima/klimastatus-og-fremskrivning)

TABLE 4.2A DENMARK'S GREENHOUSE GAS EMISSIONS 1990-2022 AND THE MAIN RESULTS OF THE 2024 "WITH (EXISTING) MEASURES" (WEM) PROJECTION FOR 2025, 2030, 2035 AND 2040 BY SECTOR AND BY GAS (INCLUDING INDIRECT CO_2), WITH AND WITHOUT LULUCF AS REPORTED UNDER THE UNFCCC

Source: Nielsen et al. (2024a tbp), Nielsen et al. (2024b tbp) and Ministry of Climate, Energy and Utilities

GHG emissions (1990-2022) [15 March 2024 submission to the EU, AR5 GWPs] and projections (2023-2040) [WEM24 (Draft KF24), AR5 GWPs]	1990 MtCO2e	*1990 % share for / in sector*	2022 MtCO2e	*2022 % share for / in sector*	Change from 1990 (%)	2025 MtCO2e	*2025 % share for / in sector*	Change from 1990 (%)	2030 MtCO2e	*2030 % share for / in sector*	Change from 1990 (%)	2035 MtCO2e	*2035 % share for / in sector*	Change from 1990 (%)	2040 MtCO2e	*2040 % share for / in sector*	Change from 1990 (%)
Total (including LULUCF, with indirect CO_2)	**78.3**	***100.0***	**41.7**	***100.0***	**-46.8**	**36.0**	***100.0***	**-54.1**	**26.6**	***100.0***	**-66.1**	**21.7**	***100.0***	**-72.3**	**21.7**	***100.0***	**-72.3**
CO_2 (with indirect CO_2)	61.0	*77.8*	27.9	*67.0*	-54.2	22.3	*62.1*	-63.3	13.2	*49.5*	-78.4	8.7	*39.8*	-85.8	8.7	*39.8*	-85.8
Methane	9.5	*12.1*	8.8	*21.0*	-7.8	8.8	*24.5*	-7.1	9.0	*33.7*	-5.7	8.8	*40.5*	-7.4	8.8	*40.5*	-7.4
Nitrous oxide	7.8	*10.0*	4.7	*11.3*	-39.9	4.5	*12.5*	-42.5	4.2	*15.9*	-46.2	4.1	*19.0*	-47.3	4.1	*19.0*	-47.3
Industrial gases	0.0	*0.0*	0.3	*0.7*	603.8	0.3	*0.8*	669.0	0.2	*0.8*	464.0	0.1	*0.6*	258.9	0.1	*0.6*	258.9
Total (without LULUCF, with indirect CO_2)	**71.6**	***91.5***	**42.1**	***100.9***	**-41.3**	**35.3**	***98.1***	**-50.7**	**25.9**	***97.4***	**-63.9**	**22.3**	***102.9***	**-68.8**	**22.3**	***102.9***	**-68.8**
CO_2 (with indirect CO_2)	54.6	*69.7*	28.7	*68.8*	-47.5	22.0	*61.2*	-59.7	13.0	*49.0*	-76.2	9.9	*45.4*	-81.9	9.9	*45.4*	-81.9
Methane	9.2	*11.8*	8.5	*20.3*	-8.2	8.5	*23.6*	-7.7	8.5	*31.8*	-8.2	8.3	*38.0*	-10.4	8.3	*38.0*	-10.4
Nitrous oxide	7.8	*9.9*	4.7	*11.2*	-39.9	4.5	*12.4*	-42.5	4.2	*15.7*	-46.2	4.1	*18.8*	-47.5	4.1	*18.8*	-47.5
Industrial gases	0.0	*0.0*	0.3	*0.7*	603.8	0.3	*0.8*	669.0	0.2	*0.8*	464.0	0.1	*0.6*	258.9	0.1	*0.6*	258.9
1. Total Energy (with indirect CO_2)	**53.7**	***68.6***	**27.6**	***66.3***	**-48.6**	**21.1**	***58.5***	**-60.8**	**12.1**	***45.7***	**-77.4**	**8.9**	***40.8***	**-83.5**	**8.9**	***40.8***	**-83.5**
CO_2 (with all indirect CO_2 here in historic data)	52.8	*98.3*	27.0	*97.7*	-48.9	20.5	*97.4*	-61.1	11.7	*96.5*	-77.8	8.5	*96.2*	-83.9	8.5	*96.2*	-83.9
Methane	0.6	*1.2*	0.4	*1.3*	-44.8	0.3	*1.5*	-49.9	0.3	*2.1*	-60.9	0.2	*2.1*	-70.3	0.2	*2.1*	-70.3
Nitrous oxide	0.3	*0.5*	0.3	*1.0*	6.4	0.2	*1.0*	-18.4	0.2	*1.4*	-37.0	0.2	*1.7*	-44.4	0.2	*1.7*	-44.4
2. Total Industrial Processes and Product Use	**2.1**	***2.7***	**1.7**	***4.0***	**-20.8**	**1.6**	***4.4***	**-25.4**	**1.3**	***4.9***	**-38.2**	**1.3**	***5.8***	**-40.5**	**1.3**	***5.8***	**-40.5**
CO_2	1.2	*55.2*	1.4	*82.4*	18.1	1.3	*79.7*	7.7	1.1	*81.7*	-8.6	1.1	*87.3*	-6.0	1.1	*87.3*	-6.0
Methane	0.0	*0.1*	0.0	*0.2*	2.2	0.0	*0.0*	-100.0	0.0	*0.0*	-100.0	0.0	*0.0*	-100.0	0.0	*0.0*	-100.0
Nitrous oxide	0.9	*42.8*	0.0	*1.1*	-98.0	0.0	*1.3*	-97.8	0.0	*1.5*	-97.8	0.0	*1.6*	-97.8	0.0	*1.6*	-97.8
Industrial gases	0.0	*1.8*	0.3	*16.4*	603.8	0.3	*19.0*	669.0	0.2	*16.8*	464.0	0.1	*11.1*	258.9	0.1	*11.1*	258.9
3. Total Agriculture	**13.8**	***17.7***	**11.5**	***27.7***	**-16.7**	**10.7**	***29.7***	**-22.8**	**10.0**	***37.7***	**-27.7**	**9.7**	***44.8***	**-29.7**	**9.7**	***44.8***	**-29.7**
CO_2	0.6	*4.4*	0.3	*2.3*	-56.3	0.2	*2.2*	-62.5	0.2	*2.3*	-62.5	0.2	*2.4*	-62.5	0.2	*2.4*	-62.5
Methane	6.9	*50.2*	7.1	*61.3*	1.8	6.4	*59.9*	-7.7	6.0	*59.6*	-14.1	5.8	*59.3*	-17.0	5.8	*59.3*	-17.0
Nitrous oxide	6.3	*45.4*	4.2	*36.4*	-33.2	4.1	*37.9*	-35.5	3.8	*38.1*	-39.3	3.7	*38.4*	-40.6	3.7	*38.4*	-40.6
4. Total Land-Use Categories (LULUCF)	**6.7**	***8.5***	**-0.4**	***-0.9***	**-105.7**	**0.7**	***1.9***	**-89.7**	**0.7**	***2.6***	**-89.8**	**-0.6**	***-2.9***	**-109.3**	**-0.6**	***-2.9***	**-109.3**
CO_2 (for KP2 BY only GHG emissions from deforestation)	6.3	*94.6*	-0.7	*191.8*	-111.5	0.3	*46.4*	-94.9	0.1	*19.1*	-97.9	-1.2	*196.8*	-119.3	-1.2	*196.8*	-119.3
Methane	0.3	*4.4*	0.3	*-81.7*	5.7	0.3	*47.8*	12.0	0.5	*75.0*	73.1	0.6	*-88.7*	86.7	0.6	*-88.7*	86.7
Nitrous oxide	0.1	*1.0*	0.0	*-10.1*	-42.8	0.0	*5.8*	-40.6	0.0	*5.9*	-40.6	0.1	*-8.1*	-25.7	0.1	*-8.1*	-25.7
5. Total Waste	**2.0**	***2.5***	**1.2**	***2.9***	**-37.6**	**2.0**	***5.5***	**0.5**	**2.4**	***9.2***	**24.0**	**2.5**	***11.5***	**27.0**	**2.5**	***11.5***	**27.0**
CO_2	0.0	*0.8*	0.0	*1.2*	-9.8	0.0	*0.5*	-39.3	0.0	*0.4*	-39.3	0.0	*0.4*	-39.3	0.0	*0.4*	-39.3
Methane	1.6	*83.1*	0.9	*74.1*	-44.4	1.7	*87.3*	5.5	2.2	*92.2*	37.5	2.3	*92.4*	41.1	2.3	*92.4*	41.1
Nitrous oxide	0.3	*16.0*	0.2	*14.1*	-45.3	0.2	*9.1*	-42.7	0.2	*7.4*	-42.7	0.2	*7.2*	-42.7	0.2	*7.2*	-42.7
1x. Total Energy (excluding Transport)	**43.0**	***54.9***	**15.6**	***37.4***	**-63.7**	**10.9**	***30.3***	**-74.6**	**4.1**	***15.6***	**-90.4**	**3.2**	***14.8***	**-92.5**	**3.2**	***14.8***	**-92.5**
CO_2 (with all indirect CO_2 here in historic data)	42.3	*98.3*	15.1	*96.7*	-64.3	10.4	*95.7*	-75.3	3.8	*91.0*	-91.1	2.9	*90.7*	-93.1	2.9	*90.7*	-93.1
Methane	0.6	*1.3*	0.3	*2.2*	-37.5	0.3	*2.9*	-41.9	0.3	*6.1*	-54.6	0.2	*5.9*	-65.5	0.2	*5.9*	-65.5
Nitrous oxide	0.2	*0.4*	0.2	*1.1*	-7.0	0.2	*1.4*	-17.8	0.1	*2.9*	-34.2	0.1	*3.4*	-39.7	0.1	*3.4*	-39.7
1A3 Transport	**10.7**	***13.7***	**12.0**	***28.9***	**12.0**	**10.2**	***28.2***	**-5.5**	**8.0**	***30.1***	**-25.5**	**5.7**	***26.0***	**-47.4**	**5.7**	***26.0***	**-47.4**
CO_2	10.6	*98.4*	11.9	*98.95*	12.7	10.1	*99.3*	-4.6	8.0	*99.4*	-24.7	5.6	*99.3*	-46.9	5.6	*99.3*	-46.9
Methane	0.1	*0.8*	0.0	*0.07*	-90.3	0.0	*0.0*	-100.0	0.0	*0.0*	-100.0	0.0	*0.0*	-100.0	0.0	*0.0*	-100.0
Nitrous oxide	0.1	*0.8*	0.1	*0.97*	34.4	0.1	*0.7*	-19.7	0.1	*0.6*	-42.6	0.0	*0.7*	-54.1	0.0	*0.7*	-54.1
1y. Total Energy (excluding Transport, Business and Households)	**28.2**	***36.1***	**8.8**	***21.1***	**-68.8**	**5.8**	***16.1***	**-79.5**	**1.4**	***5.3***	**-95.0**	**0.9**	***4.2***	**-96.8**	**0.9**	***4.2***	**-96.8**
CO_2 (with all indirect CO_2 here in historic data)	27.8	*98.5*	8.5	*96.8*	-69.4	5.5	*94.8*	-80.3	1.2	*84.3*	-95.8	0.8	*82.4*	-97.3	0.8	*82.4*	-97.3
Methane	0.3	*1.2*	0.2	*2.4*	-40.4	0.2	*4.0*	-34.0	0.2	*12.9*	-48.3	0.1	*13.2*	-65.6	0.1	*13.2*	-65.6
Nitrous oxide	0.1	*0.3*	0.1	*0.8*	-9.8	0.1	*1.2*	-9.8	0.0	*2.9*	-48.5	0.0	*4.4*	-48.5	0.0	*4.4*	-48.5
1A2+1A4a+1A4c: "Business" (Manufac.+Com./Inst.+Agri./Forest./Fish.)	**9.6**	***12.2***	**5.6**	***13.5***	**-41.2**	**4.3**	***12.0***	**-54.9**	**2.5**	***9.4***	**-73.9**	**2.2**	***9.9***	**-77.5**	**2.2**	***9.9***	**-77.5**
CO_2	9.4	*98.7*	5.5	*97.9*	-41.7	4.2	*98.1*	-55.2	2.4	*96.8*	-74.4	2.1	*96.3*	-78.1	2.1	*96.3*	-78.1
Methane	0.1	*0.5*	0.1	*1.0*	9.9	0.0	*0.7*	-40.1	0.0	*1.2*	-40.1	0.0	*1.4*	-40.1	0.0	*1.4*	-40.1
Nitrous oxide	0.1	*0.8*	0.1	*1.2*	-15.6	0.1	*1.2*	-34.8	0.1	*2.0*	-34.8	0.1	*2.3*	-34.8	0.1	*2.3*	-34.8
1A4b: "Households" (Residential)	**5.2**	***6.6***	**1.2**	***2.8***	**-77.3**	**0.8**	***2.3***	**-84.2**	**0.2**	***0.9***	**-95.6**	**0.2**	***0.7***	**-96.9**	**0.2**	***0.7***	**-96.9**
CO_2	5.0	*96.5*	1.1	*90.1*	-78.8	0.7	*89.0*	-85.4	0.2	*69.6*	-96.8	0.1	*62.5*	-98.0	0.1	*62.5*	-98.0
Methane	0.2	*2.9*	0.1	*6.9*	-46.6	0.1	*7.3*	-60.5	0.0	*17.4*	-73.7	0.0	*25.0*	-73.7	0.0	*25.0*	-73.7
Nitrous oxide	0.0	*0.5*	0.0	*3.0*	24.2	0.0	*3.7*	6.6	0.0	*13.0*	6.6	0.0	*12.5*	-29.0	0.0	*12.5*	-29.0

FIGURE 4.1 DENMARK'S GREENHOUSE GAS EMISSIONS IN 2022 BY SECTOR
Source: Nielsen et al. (2024a tbp) and the Danish Ministry of Climate, Energy and Utilities



Separate estimate of the effect of the 2018 Energy Agreement
In this report the effects of the policies and measures *adopted* with the 2018 Energy Agreement is included in the "With Existing Measures" (WEM) greenhouse gas projection scenario from 2022.

In 2018, it was estimated that the *2018 Energy Agreement* alone will provide a 10-11 million tonnes reduction in Denmark's total greenhouse gas emissions by 2030. The majority of these reductions will be within sectors covered by the EU's Emissions Trading System (EU ETS) as approximately 0.15-0.25 million tonnes CO_2 is estimated to be the reduction in 2030 outside of the EU ETS (non-ETS). Accumulated over the non-ETS reduction commitment period 2021-2030 the energy agreement's initiatives are expected to reduce carbon emissions from the non-ETS sectors by approximately 1.1 to 1.5 million tonnes CO_2 in the period 2021-2030. The largest contributions come from new energy saving subsidies and the reduced electricity heating tax which makes it more attractive to switch to heat pumps. With these and other initiatives, the *2018 Energy Agreement* will help Denmark reach its 50% greenhouse gas emissions reduction target by 2030 in the non-ETS sectors.

Separate estimates of the effects of political agreements since December 2019
The separate estimates of the effects of political agreements reached since December 2019, included in the statement by the Minister for Climate, Energy and Utilities submitted to the Danish parliament in December 2023, are included in Table 4.2b.

TABLE 4.2B ESTIMATED GREENHOUSE GAS EMISSION REDUCTION EFFECTS OF AGREEMENTS WITH A REDUCTION EFFECT SINCE THE AGREEMENT ON THE DANISH CLIMATE ACT (DECEMBER 2019) AND THE REDUCTION SHORTFALLS IN ACHIEVING THE DOMESTIC REDUCTION TARGETS FOR 2025 AND 2030 IN THE DANISH CLIMATE ACT, IN MILLION TONNES OF CO_2 EQUIVALENTS.

Agreements with a reduction effect since the agreement on the Danish Climate Act							
The agreements and the annual WEM projections DECO: Denmark's Energy and Climate Outlook CSO : Climate Status and Outlook	**Total greenhouse gas emissions** *(Million tonnes CO_2e)*			**Reduction from 1990** *(pct., rounded)*		**Reduction shortfalls in achieving the domestic tagets for 2025 and 2030** *(Million tonnes CO_2e)*	
	1990	**2025**	**2030**	**2025**	**2030**	**2025**	**2030**
Estimates when the Agreement on a new Climate Act was agreed (6 December 2019)*	**75.2**	**43.5**	**41.0**	**42**	**45**	**5.9-8.9**	**18.4**
Changes to DECO20		*+2.1*	*+2.1*				
The 2020 projection (DECO20, WEM scenario)	**77.2**	**45.7**	**43.1**	**41**	**44**	**7-10.1**	**19.9**
The green housing agreement 2020 (19 May 2020)		*-0.0*	*-0.1*				
The climate plan for a green waste sector and circular economy (16 June 2020)		*0*	*-0.7*				
The climate agreement for energy and industry etc. 2020 (22 June 2020)		*-1.3*	*-2.7*				
The agreement on the future of oil and gas extraction in the North Sea (3 December 2020)		*0*	*-0.0*				
The agreement on green transformation of road transport (excluding kilometer-based road tax for trucks) (December 4, 2020)		*-0,9*	*-1.9*				
The agreement on the Finance Act for 2021 and the agreement on stimuli and green recovery (6 December 2020)		*-0.2*	*-0.2*				
The agreement on a green tax reform (8 December 2020)		*-0.5*	*-0.5*				
Other changes from DECO20 to CSO21	*0,1*	*-1.9*	*-2.0*				
The 2021 projection (CSO21, WEM scenario)	**77.4**	**40.8**	**35.0**	**47**	**55**	**2.1-5.2**	**11.8**
The agreement on the green transformation of agriculture (October 4, 2021)		*-1.2*	*-1.9*				
The sub-agreement on investments in a continuously greener Denmark 2022 (December 4, 2021) and the agreement on the Finance Act for 2022 (December 6, 2021)		*-0.5*	*-0.5*				
Other changes from CSO21 to CSO22	*0.6*	*+2.3*	*+0.9*				
The 2022 projection (CSO22, WEM scenario)	**78.0**	**41.4**	**33.5**	**47**	**57**	**2.4-5.5**	**10.1**
The agreement on green tax reform for industry etc. (June 24, 2022)		*-1.3*	*-4.3*				
The agreement on kilometer-based road tax for trucks (24 June 2022) and the agreement on kilometer-based road tax for trucks (29 March 2023)		*-0.3*	*-0.4*				
The climate agreement on green electricity and heat 2022 (25 June 2022)		*-0.4*	*-0.4*				
Other changes from CSO22 to the draft CSO23	*0.4*	*+0.3*	*+0.5*				
The 2023 projection (CSO23, WEM scenario, Final, November 2023)	**78.4**	**39.7**	**28.9**	**49**	**63**	**0.5-3.7**	**5.4**
*The estimated partial effect of the implementation of the new EU ETS***		*0.0*	*-0.4*				
Agreement on green aviation in Denmark (15 December 2023)		*0.0*	*-0.3*				
Other changes from CSO23 to the draft CSO24	*-0.1*	*-4.4*	*-3.1*				
The 2024 projection (CSO24, WEM scenario, Draft)	**78.3**	**35.3**	**25.4**	**55**	**68**	**Achieved**	**1.9**
The estimated partial effect of the transition support from Agreement on implementation of the transition support from Green tax reform for industry etc. (March 2024)		*-0.1*	*-0.1*				
The estimated partial effect of changes in diesel and road tax from the Agreement on partial implementation of the Green Fund (April 2024)		*-0.3*	*-0.3*				
CSO24 including the estimated partial effects mentioned above		**34.8**	**25.0**	**56**	**68**	**Achieved**	**1.5**

Notes:
* Based on DECO19 and adjusted to take into account the effect of the agreement on the Finance Act for 2020 (of 2 December 2019).
** This is the gross effect, cf. proposal for an act on CO_2 quotas. An estimate of the overall effect will be available with the overall proposal for implementation.

Sources:
Climate programme 2023 (September 2023: https://kefm.dk/Media/638315764817167867/Klimaprogram%202023.pdf);
Annual statement of climate effects 2023 (December 2023: https://www.kefm.dk/Media/638435855892254929/Redeg%C3%B8relse%20om%20klimaeffekter%202023.pdf);
Climate Status and Outlook 2024 (draft April 2024: https://kefm.dk/klima/klimastatus-og-fremskrivning) and the estimated partial effects therein - of the transition support from Agreement on implementation of the transition support from Green tax reform for industry etc. (March 2024) and of the partial effect of changes in diesel and road tax from the Agreement on partial implementation of the Green Fund (April 2024).

4.3.1 Cross-cutting – The EU Emission Trading Scheme

EU ETS 2005-2007

Directive 2003/87/EC on trading in CO_2 allowances (the EU ETS Directive) in 2005 introduced a greenhouse gas emissions allowance trading scheme in the EU. The objective of the allowance scheme is to reduce emissions of greenhouse gases so that the EU and its Member States can meet their reductions commitments under the Kyoto Protocol and the EU Burden-Sharing Agreement.

EU ETS 2008-2012

According to the EU ETS Directive, each Member State had to prepare a national allocation plan before the trading period 2008-12.

The European Commission approved the Danish National Allocation Plan (NAP2) in 2007. The NAP contained a detailed plan for the reduction efforts. In the NAP, the gap between the emission target and emission under business as usual amounted to 13 million tonnes CO_2 per year. Of this gap, 5.2 million tonnes CO_2 are covered by efforts in the emission trading sectors, while the remaining 7.8 million tonnes CO_2 are covered by efforts in the non-emission trading sectors using various instruments, including the use of CDM credits, sinks and additional domestic efforts. The NAP also ensures that Denmark honours the supplementarity principle.

Via the NAP, the allowance regulation in Denmark included individual emission limits 2008-2012 for CO_2 emissions from several sectors, which together produce approx. half of Denmark's total greenhouse gas emissions. Denmark allocated a total of 125 million CO_2 emission allowances during the five years of the scheme. Of these, 2.5 million have been allocated to new production units and major expansions. The rest have been allocated free of charge to those production units covered by the trading scheme in 2007.

In the following, only the principles and general figures for Denmark's implementation of the EU ETS Directive via NAP2 will be described.

From the 1 January 2008 the first Kyoto Commitment Period (CP1) commenced. In practice the EU ETS has not changed for the Danish operators under the EU ETS, even after the Community Independent Transaction Log and the registries under the EU ETS connected to the International Transaction Log under the UN on 28 October 2008, as the registry was already ready to work in the international emissions trading system.

Relevant key figures in the NAP for Denmark for the period 2008 – 2012 are shown in Table 4.3.

Denmark was committed to reducing its national greenhouse gas emissions by 21% in 2008-12, compared to 1990/1995 level. That meant that emissions had to be reduced to an average 54.8 million tonnes of CO_2 equivalents annually for the period.

In NAP2, if no further initiatives were implemented, the deficit between expected Danish emissions of CO_2 and the target Denmark was committed to achieving was expected to reach 13 million tonnes for the period 2008-12. The NAP documented how this deficit would be reduced to zero. As stated in NAP2, Denmark would meet its commitment through a combination of domestic and foreign environmental and energy measures introduced by the government and by Danish enterprises with CO_2 emissions primarily related to the non-emission trading sectors.

TABLE 4.3: KEY FIGURES IN THE PROPOSAL FOR DENMARK'S NATIONAL ALLOCATION PLAN 2008-12
Source: Denmark's National Allocation Plan 2008-12 (NAP2), 2007

	2003 emissions	Projected emissions 2008-12	Quota allocation 2008-12	Quota allocation 2005-07
	Million tonnes CO_2 equivalents per year			
Sectors subject to allowances, in total	36.6	29.7	24.5	33.5
- electricity & heat production	28.1	20.5	15.8	21.7
- other sectors subject to allowances, incl. offshore industries-	8.5	9.2	8.2	7.1
- auction			0	1.7
- new installations			0.5	1
Sectors not subject to allowances	*37.8*[1]	*38.1*		
Total	74.4	67.8		

[1] On the basis of the European Commission's broad definition of enterprises covered.

Denmark has had an active, environmentally oriented energy policy since the 1970s, and since 1990 this has been supplemented by an actual climate policy which, on an international scale, has entailed a major strain - economically and/or via administrative regulations - on most greenhouse gas emissions, especially from businesses and the non-emission trading sectors.

The period 2008 – 2012 was finalized in 2013 with the final surrendering of allowances and credits by companies participating under the EU ETS. The final EU ETS accounting in Denmark for the period 2008-2012 shows that total verified CO_2 emissions under the EU ETS in Denmark were a little below the total amount of allocated allowances cf. Table 4.4. However, some companies have to some extent surrendered credits from JI and CDM projects and presumably instead sold or banked their surplus EU allowances.

TABLE 4.4: VERIFIED CO_2 EMISSIONS UNDER THE EU ETS IN DENMARK, FREE ALLOCATIONS AND SURPLUS/DEFICIT FOR THE PERIOD 2008-2012
Source: Danish Energy Agency, May 2013

	Verified CO_2 emissions under the EU ETS in Denmark 2008-2012						**Free allocation**	**Excess of quotas (negative number represents a deficit)**
	2008	2009	2010	2011	2012	Annual Average 2008-12	Annual Average 2008-12	Annual Average 2008-12
	Million tonnes CO_2						Million tonnes EUAs	Million tonnes EUAs
Central power plants	17.6	17.8	17.2	13.8	10.9	15.46	13.4	-2.06
Industry and Service	5.3	4.3	4.2	4.3	4.3	4.48	5.8	1.32
Offshore	2.0	1.8	1.9	1.7	1.7	1.82	2.3	0.48
Other electricity and heat production	1.6	1.6	2.0	1.6	1.4	1.64	2.4	0.76
Total stationary[1]	**26.5**	**25.5**	**25.3**	**21.5**	**18.2**	**23.4**	**23.9**	**0.5**
Aviation[2]			(1.5)	(1.4)	1.3	1.3	1.1	-0.2

[1] In 2012, a total of 375 stationary installations were covered. Of these were 16 central power and heat plants, 111 manufacturing industries, 241 decentralized electricity and district heating plants and 7 offshore companies.
[2] In 2012, total CO_2 emissions from the 26 aircraft operators covered by the EU ETS in Denmark exceeded the free allocation of allowances for 2012. It should be noted that aviation emissions for 2012 cannot be compared with previous years, as aircraft operators in 2012 have been able to make use of the EU Commission's "stop- the-clock " decision. This decision, which applies only for 2012, gives an operator the opportunity to deduct CO_2 emissions related to flights in and out of the EU. Most operators chose to make use of this opportunity.

EU ETS 2013-2020

The EU Climate and Energy Agreement from December 2008 extended the ETS system to 2013-2020 in order for the EU to reduce CO_2-emissions by 20% in 2020. At the same time allocation was centralised and reduced, while auctioning is being/have been used more extensively since 2013.

Free allocation for stationary installations is carried out on the basis of benchmarks. These benchmarks reward best practice in low-emission production and are an important signal of the EU's commitment to move towards a low-carbon economy.

Although auctioning is the default method for allocating emission allowances to companies participating in the EU ETS, some manufacturing industries continue to receive a share of free allowances until 2020 due to an estimated significant risk of carbon leakage. The heat production also continues to receive free allowances – however declining from 80% of the benchmark in 2013 to 30% of the benchmark in 2020 for those not being exposed to carbon leakage.

The allowances for the installations in the EU ETS have been calculated for 2013-2020 in accordance with the EU benchmarking decision 2011/278/EU. The Danish National Implementation Measures (NIM) list was approved by the European Commission in January 2014.

Waste incineration plants which are primarily used for district heating were included in the ETS in Denmark by 1st of January 2013, while about 30 installations exclusively using biomass were excluded of the ETS. The inclusion of waste incineration plants lead to an increase in the total amount of CO_2-emission from the ETS in Denmark in 2013 compared to 2012.

Installation faced a yearly reporting obligation on emissions as well as on relevant activity levels i.e. ton of bricks, heat produced etc. In case of activity levels significantly deviating from NIM this affected allocation onwards by either reducing or re-setting allocation according to NIM.

Aviation has been a part of ETS since 2012. Aircraft operators get free allowances based on their activity and the scope.

EU ETS 2021-2030

The legislative framework of the EU ETS for its next trading period 2021-2030 (phase 4) was revised in early 2018 to enable it to achieve the EU's 2030 emission reduction targets in line with the 2030 climate and energy policy framework and as part of the EU's contribution to the 2015 Paris Agreement.

The revision focuses on:

- Strengthening the EU ETS as an investment driver by increasing the pace of annual reductions in allowances to 2.2% as of 2021 and reinforcing the Market Stability Reserve (the mechanism established by the EU in 2015 to

reduce the surplus of emission allowances in the carbon market and to improve the EU ETS's resilience to future shocks).

- A severe reduction in the number of sectors deemed at significant risk of carbon leakage but otherwise continuing the free allocation of allowances as a safeguard for the international competitiveness of industrial sectors at significant risk of carbon leakage, while ensuring that the rules for determining free allocation are focused and reflect technological progress including updated benchmarks based on actual data from covered entities.
- Helping industry and the power sector to meet the innovation and investment challenges of the low-carbon transition via several low-carbon funding mechanisms.

The Fit for 55 package endorsed on 8 February 2023 by the Permanent Representatives Committee proposes to revise several pieces of EU climate legislation, including the EU ETS, setting out in real terms the ways in which the Commission intends to reach EU climate targets under the European Green Deal. The revised EU ETS Directive, adopted 5 June 2023 and applied from 1 January 2024, will enable this through a mix of interlinked measures eg. a mayor revision of EU ETS as well as inclusion of ETS Maritime and ETS Transport, Building and Industries.

The revision focuses on:

- Strengthening the EU ETS further as an investment driver by increasing the pace of annual reductions in allowances. The linear factor shall be 4,3 % from 2024 to 2027 and 4,4 % from 2028
- Free allowances in the Emissions Trading System (ETS) to be phased out from 2026
- Free allocation to the aviation sector to be phased out by 2026 and non-CO2 emissions included by 2025
- Maritime sector included by 2024, no free allocation and increasing surrendering obligation to 100% by 2026
- Road transport and buildings in new ETS II from 2027, monitoring from 2025
- New carbon leakage instrument to protect EU industry at significant risk of carbon leakage (CBAM) and increase global climate ambition
- A Social Climate Fund to combat energy and mobility poverty
- A Recovery and Resilience Facility referring to policy areas of the European Union relevance structured in six pillars:
    a) Green transition;
    b) Digital transformation;
    c) Smart, sustainable and inclusive growth, including economic cohesion, jobs, productivity, competitiveness, research, development and innovation, and a well-functioning internal market with strong SMEs;
    d) Social and territorial cohesion;
    e) Health, and economic, social and institutional resilience, with the aim of, inter alia, increasing crisis preparedness and crisis response capacity; and
    f) Policies for the next generation, children and the youth, such as education and skills.

- Increased amount of allowances allocated to the Innovation Fund
- Non-CO2 effect of aviation monitored from 2025

Denmark's national allowance registry

Denmark's national allowance registry – (DK ETR – Emission Trading Registry[4]) has been operating since 1 January 2005. The DK ETR is used to allocate allowances to production facilities subject to allowances and enables trade in allowances among the allowance holders found in the registry. Since the 1st of July 2012 the DK ETR has been a part of the EU ETS that host the emission trading registry for all of the member states in the EU. The DK ETR is constructed so it also fulfils the Kyoto requirements.

4.3.2 -

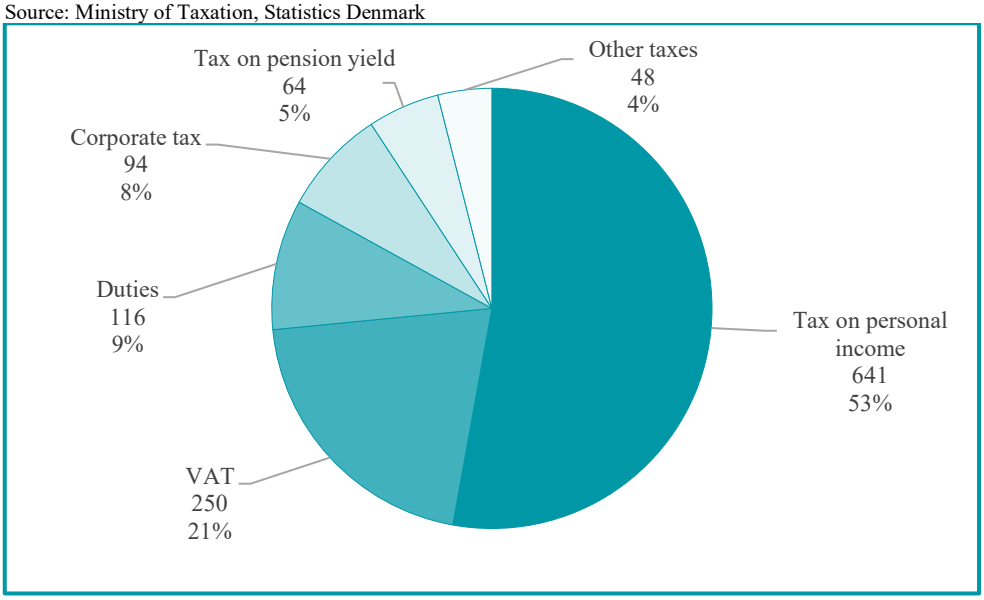
4.3.3 Cross-cutting – Taxes and duties

In Denmark, total taxes and duties made up a total of approx. 43% of GDP in 2021. The public sector provides childcare, education, unemployment benefits, health and disability benefits, old-age pensions, and many other services.

Personal income tax is the most important tax, constituting about half of total tax revenues. Other taxes are VAT, duties and corporation taxes. Danish VAT is relatively high, 25%, and there are no differentiated rates. There are a considerable number of additional consumption taxes and environmental taxes. The corporation tax rate is 22%.

Total revenue from all taxes and duties amounted to DKK 1,200 billion in 2023. The relative distribution is shown in Figure 4.2.

FIGURE 4.2 RELATIVE DISTRIBUTIONS OF TAXES AND DUTIES 2023 IN BILLION DKK AND PERCENTAGE
Source: Ministry of Taxation, Statistics Denmark



[4] https://www.kvoteregister.dk

Taxes that influence Denmark's greenhouse gas emissions

Retail prices on products that influence Danish greenhouse gas emissions are, in most cases, the decisive factor determining the degree to which they are consumed. Energy prices influence the composition and total size of energy consumption. Therefore extra taxes and duties put on products influence the consumption of these products and the size of greenhouse gas emissions associated with the use of the products.

Denmark has special taxes on motor vehicles, energy products, alcohol, tobacco, and a number of other products. Taxes are in accordance with EU legislation.

The introduction of CO_2 taxes and the increase in the rates of individual energy taxes since 1990 have influenced the consumption of a number of energy products and have therefore reduced the CO_2 emissions associated with consumption of these products.

4.3.3.1 CO_2, CH_4, and N_2O - taxes and duties relevant to these emissions

4.3.3.1.1 Energy

Denmark has had taxes on energy for many years. Since the first oil crisis in the early 1970s, the rates of the taxes have been aimed at reducing consumption and promoting the instigation of more energy-saving measures. Lower energy consumption will reduce emissions of CO_2, methane (CH_4), and nitrous oxide (N_2O) associated with combustion of fossil fuels.

Danish energy taxes are laid down in the four Danish tax acts on mineral-oil, gas, coal, and electricity, respectively (Mineralolieafgiftsloven, Gasafgiftsloven, Kulafgiftsloven, and Elafgiftsloven). As from 1 January 2016 the tax rates set in these tax acts follow a yearly regulation based on the consumer price index of two years prior. Besides the energy taxes there is also a tax on CO_2, NO_x, sulphur and industrial gasses (see Table 4.5).

TABLE 4.5 ENERGY TAXES 2010, 2015 AND 2020-2023
Source: Ministry of Taxation

	Unit	2010	2015	2020	2021	2022	2023
Coal	*DKK/toe*	2,399	2,282	2,374	2,629	2,638	2,675
Natural gas	*DKK/toe*	2,405	2,282	2,374	2,629	2,638	2,675
Oil products[1]	*DKK/toe*	2,400	2,282	2,374	2,625	2,638	2,675
Electricity: For heating	*DKK/kWh*	0.545	0.380	0.210	0.008	0.008	0.008
Electricity: Other	*DKK/kWh*	0.659	0.878	0.892	0.90	0.900[2] 0.763[3] 0.723[4]	0.008[5] 0.697[6]
Waste: Heating from waste[7]	*DKK/toe*	1,930	1,901	1,980	2,190	2,198	2,227
Other compostable biomass	*DKK/toe*	0	0	0	0	0	0

[1]Only oil used for other purposes than motor fuels
[2]From 1 January 2022 – 30 June.
[3]From 1 July 2022 – 30 September 2022.
[4]From 1 October 2022 – 31 December 2022.
[5]From 1 January 2023 – 30 June 2023.
[6]From 1 July 2023 – 31 December 2023
[7]Tax rates on waste are rates on heat production (output) while tax rates on coal, natural gas and oil products are input rates. Rates correspond under the used convention in energy tax acts of heating efficiency for CHP plants.

A tax on NO_x (nitrogen oxides) was originally introduced as part of a 2008 energy agreement and came into effect on 1 January 2010 with a rate of 5 DKK per kg NOx. From 1 January 2012, a considerable increase in the taxation of NOx from 5 DKK per kg NOx to 25 DKK per kg NOx was implemented. However, the rate was reduced in 2016 to 5 DKK per kg NOx.

A tax on sulphur in fuels was introduced 1 January 1996 with a rate of 20 DKK per kg sulphur in fuels and a rate of 10 DKK for SO_2 emitted to the air. One of the side effects of this tax is assumed to be a reduction in CO_2 emissions.

In March 2012 a general agreement on Danish energy policy from 2012-2020 was made. The agreement seeks to ensure the transition from an energy supply based on fossil fuels to one based on renewable energy. Additional initiatives regarding taxes and duties have been adopted with the 2018 Energy Agreement and planned with the 2018 Climate and Air proposal. Further initiatives have been adopted with the 2020 Climate Agreement for energy and industry, the 2020 Green reform Agreement. To implement incentives to change to green energy and to meet the high energy prices several Agreements reducing the electricity tax was implemented in 2022, including the 2022 New reform package for Danish economy, the 2022 Compensation for citizens for higher energy prices Agreement, the 2022 Winter help Agreement. These initiatives are described later.

The Mineral-oil Tax Act entered into force on 1 January 1993. Before this, the tax on petrol was regulated via the Petrol Tax Act, which entered into force on 1 January 1983, and the Act on Taxation of Gas Oil and Diesel Oil, Heating Oil, Heating Tar, and Crude Oil was regulated via the Act on Taxation of certain Oil Products, which entered into force on 3 October 1977. Tax rates from recent years are shown in Table 4.6.

TABLE 4.6 TRENDS IN TAXES 2010, 2015 AND 2020-2023 UNDER THE MINERAL-OIL TAX ACT, STATED IN DKK/LITRE
Source: Ministry of Taxation

DKK per litre	2010	2015	2020	2021	2022	2023
Gas oil and diesel oil used as motor fuels	2.774	2.997	3.120	3.147	3.159	3.204
Light diesel oil	2.669	2.881	2.999	3.025	3.037	3.080
Diesel low in sulphur content	2.479	2.674	2.784	2.808	2.818	2.859
Diesel without sulphur	2.479	2.674	2.784	2.808	2.818	2.859
Fuel oil	2.330	2.215	2.324	2.552	2.561	2.598
Auto gas	1.726	1.814	1.903	1.905	1.912	1.939

From 1 June 1999 a tax differentiation between light diesel and diesel low in sulphur was introduced, to encourage the use of diesel low in sulphur, which is less polluting than light diesel. This was accomplished and a change took place soon after to the effect that almost all diesel sold was low in sulphur. The purpose of further differentiation from 1 January 2005 favouring sulphur-free diesel was likewise to encourage the use of this type of diesel in favour of diesel low in sulphur, and this has been successful.

In addition, tax differentiation has been introduced in order to achieve environmental goals other than direct reductions in greenhouse gas emissions. Thus tax differentiation has been introduced with a view to phasing out lead in petrol. The rate of tax to achieve this environmental goal is shown in Table 4.7.

Further, the tax rate for mineral oils used in business are increased with 6 DKK/GJ which is phased in from 2023 to 2025. The tax rate for mineral oils used in mineral processes etc. and agriculture etc. are increased with 6 DKK/GJ in 2025. Both taxes will be indexed yearly and are an implementation of the 2020 Green Tax reform Agreement.

TABLE 4.7 TRENDS IN TAXES ON DIFFERENT TYPES OF PETROL 2010, 2015 AND 2020-2023, DKK PER LITRE
Source: Ministry of Taxation

DKK per litre	2010	2015	2020	2021	2022	2023
Petrol, with lead[1]	4.567	4.959	5.162	5.207	5.227	5.301
Petrol, lead-free	3.881	4.209	4.382	4.419	4.436	4.499

[1] The term has been kept even though petrol companies in Denmark ceased using lead for octane improvement in 1994.

The gas tax on natural and town gas was introduced in its current form on 1 January 1996 with a rate for both natural and town gas at DKK 0.01/Nm^3. There has been taxation on gas, however, since 1 January 1979, when the tax on town gas and LPG was introduced. The tax on town gas was cancelled again in June 1983 and regulation of the tax on LPG was transferred to the Mineral-gas Tax Act when this Act entered into force. From 1 January 2015 a tax on biogas was introduced. The tax rates on gas from recent years are shown in Table 4.8.

Further, the tax rate for gas used in businesses are increased with 6 DKK/GJ which is phased in from 2023 to 2025. The tax rate for gas used in mineral processes etc. and agriculture etc. are increased with 6 DKK/GJ in 2025. Both taxes will be indexed yearly and are an implementation of the 2020 Green Tax reform Agreement.

TABLE 4.8 TAXES ON GAS 2010, 2015 AND 2020-2023, DKK PER NM^3
Source: Ministry of Taxation

DKK per Nm^3	2010	2015	2020	2021	2022	2023
Natural gas	2.270	2.158	2.246	2.486	2.496	2.531
Town gas	2.270	2.158	2.246	2.486	2.496	2.531

The coal tax was introduced on 1 July 1982 and constituted DKK 127/tonne for hard coal and DKK 91/tonne for lignite and lignite briquettes on the day of entry into force. In the period 1 January 1997 - 31 December 2015 the tax increased from DKK 950/tonne to DKK 1526/tonne for hard coal and DKK 700/tonne to DKK 1036/tonne lignite. The rates have since 2008 developed as shown in Table 4.9. With effect from 1 January 1999, the so-called waste heat tax introduced (see Law no. 437 of 26 June 1998) as part of the Coal Tax Act. The waste heat tax was introduced in connection with increases in general taxes on fossil fuels to avoid giving too much incentive in favour of waste-based heat production, and to counteract the increased incentive for incineration of waste instead of recycling. Since 1 January 2010 the tax has been based on the energy and CO_2 content of the waste. After the restructuring of the tax on waste, the waste incineration tax was transferred from the Waste Tax Act to the Coal Tax Act and carbon dioxide tax law (see Law no. 461 of 12 June 2009 and the

entry into force of Executive Order no. 1125 of 1 December 2009). Context of the proposal was especially that the then tax structure for waste fuels and fossil fuels taken together could result in waste streams being affected, so waste is not disposed of where it was most effective regarding utilization of energy from waste. The purpose of the change was to make waste more cost-efficient, which means a welfare economic gain. The change improves the tax structure, because the waste now ordered virtually the same charges as fossil fuels. The restructuring charges will then be more neutral with respect to where the waste is burned. From 1 January 2010, energy from waste incineration is imposed a waste heat tax, surcharge and the CO_2 tax. CO_2 tax only applies for waste that is not biodegradable.

TABLE 4.9 TRENDS IN COAL TAXES 2010, 2015 AND 2020-2023, DKK PER TONNE
Source: Ministry of Taxation

DKK per tonne	2010	2015	2020	2021	2022	2023
Hard coal	1605	1526	1588.6	1758.1	1765	1790
Lignite	1089	1036	1078.5	1193.5	1198	1215

The electricity tax was introduced on 1 April 1977. With effect from 1 January 2013, the tax on electricity used for heating was reduced considerably, to take into account, that an increasing amount of renewable energy was being used in electricity production. It has been estimated that this will lead to an emission reduction outside the emissions trading scheme of 0.15 million tonnes CO_2 in 2015 and 0.29 million tonnes in 2018. Table 4.10 shows the development in electricity tax rates since 2010.

From 1 May 2018 until the end of 2019 the tax on electricity for heating was further reduced from DKK 0.407 per kWh by DKK 0.15 per kWh. In 2020 it was reduced by DKK 0.20 per kWh and from 2021 it was reduced by DKK 0.10 per kWh.

To implement elements of the 2020 Climate Agreement for energy and industry the tax on electrical heating was reduced from 0.155 DKK/kWh to 0.004 DKK/kWh for industries and to 0.008 DKK/kWh for households in 2021 in accordance with the EU minimum tax rates.

To support the green transition, a decrease on the electricity tax was agreed upon in the 2022 New reform package for the Danish economy. The tax on electricity was reduced from 0.9 DKK/kWh to 0.796 DKK/kWh phased in from 2022-2030.

As a compensation for the high energy prices, the tax on electricity is temporarily reduced from 0.763 DKK/kWh to 0.723 in the 4th quarter of 2022 and further to 0.688 in 2023. Further, the Winter Help Agreement entailed a temporary reduction on the electricity tax to the EU minimum tax rate on 0.008 DKK/kWh in the first 6 months of 2023.

TABLE 4.10 TRENDS IN ELECTRICITY TAXES 2010, 2015 AND 2020-2023, DKK PER KWH
Source: Ministry of Taxation

DKK per kWh	2010	2015	2020	2021	2022	2023
Consumption of electricity, exceeding 4,000 kWh in all-year residences heated by electricity and electricity for space heating and comfort cooling in VAT registered business	0.545	0.380	0.210	0.008	0.008	0.008
Other electricity	0.659	0.878	0.892	0.900	0.900[1] 0.763[2] 0.723[3]	0.008[4] 0.697[5]

[1]From 1 January 2022 – 30 June.

[2]From 1 July 2022 – 30 September 2022.
[3]From 1 October 2022 – 31 December 2022.
[4]From 1 January 2023 – 30 June 2023.
[5]From 1 July 2023 – 31 December 2023.

The CO_2 tax on energy products was introduced on 1 March 1992 and was imposed on different types of energy products relative to their CO_2 emissions. A tax reduction was given to light and heavy industrial processes. From 1 January 2010 a structural change in the CO_2 tax was implemented as an adaption to the EU Emissions Trading Scheme. The tax rate was increased to DKK 150 /tonne of CO_2 indexed as mentioned below, cf. table 4.11. In total, this structural change in the CO_2 tax was estimated to lead to a reduction in the CO_2 emissions of 0.69 million tonnes.

Large waste incineration facilities are from 1 January 2013 included in the emissions trading scheme. This will lead to a reduction of CO_2 emissions outside the ETS of approximately 8.9 million tonnes.

Fossil energy products used for space heating are imposed the CO_2 tax regardless of the production is included in the ETS or not. Space heating included in the emission trading scheme is thus double taxed.

TABLE 4.11 CO_2 TAX RATES, 2000-2009, 2010, 2015 AND 2020-2023, STATED IN DKK PER TONNE OF CO_2
Source: Ministry of Taxation

DKK per tonne	2000-2004	2005-2009	2010[1]	2015	2020	2021	2022	2023
Basic rate								
Heating in industry	100	90	155.4	170.0	177.0	178.5	179.2	181.7
Light industrial processes								
Basic rate	90	90	-	-				
With a voluntary agreement	68	68	-	-				
Resulting subsidy	22	22	-	-				
Heavy industrial processes								
Basic rate	25	25	-	-				
With a voluntary agreement	3	3	-	-				
Resulting subsidy	22	22	-	-				
Industrial processes covered by the Emission Trading Scheme								
Basic rate [2]	-	-	0	0	0	0	0	0

1 As of 1 January 2010 a structural change in the CO_2 tax was implemented. For the industries not regulated by the emissions trading scheme, a fixed lump sum transfer based on historical emissions was given, while the base rate was considerably increased to match the expected price of CO_2 quotas.
2Before 2010, the industrial processes covered by the ETS were taxed according to the table, depending on the type of process

Table 4.12 shows examples of the different types of CO_2 taxes converted into consumer units.

In addition to this, there are CO_2 taxes on heating tar, crude oil, coke, crude oil coke, lignite briquettes and lignite, LPG, and other gases.

As of 1 January 2008 the CO_2 taxes follow a yearly regulation of 1.8% in the period 2008-2015, like the energy taxes. From 2016 the tax is regulated with the consumer price index two years prior as the energy taxes.

TABLE 4.12 EXAMPLES OF CO_2 TAXES
Source: Ministry of Taxation

	Unit	2010	2015	2020	2021	2022	2023
Gas oil and diesel oil	*DKK/litre*	0.413	0.451	0.469	0.474	0.475	0.482
Gas oil and diesel oil containing 4,8% bio fuel	*DKK/litre*	0.385	0.420	0.437	0.441	0.443	0.449
Fuel oil	*DKK/kg*	0.493	0.539	0.561	0.565	0.568	0.576
Lignite	*DKK/tonne*	225.8	306.8	319.4	322.1	323.4	328.0
Natural gas and town gas	*DKK/Nm³*	0.351	0.384	0.400	0.403	0.405	0.410
Petrol	*DKK/litre*	0.373	0.408	0.425	0.428	0.430	0.436
Petrol containing 4,8% bio fuel	*DKK/litre*	0.355	0.388	0.404	0.407	0.409	0.415

4.3.3.1.2 Transport

In the transport sector, the number of cars in Denmark and the use of motorised vehicles are influenced by the tax on cars and fuels. The latter has been described above.

The registration tax on motorised vehicles is based on the value of the vehicle. Further, an additional CO_2 element is added to the tax, so the cars that have higher CO_2-emissions also pay a higher tax. Passenger cars, light commercial vehicles and motorbikes are due to pay the registration tax.

Zero- and low-emission vehicles receive a tax advantage in the registration tax compared to conventional vehicles. The tax advantage is larger for zero-emission vehicles (typically electrical vehicles) than for low-emission vehicles (typically plug-in hybrid vehicles). For zero-emission vehicles, the registration tax is discounted to 40 % of the full tax, and then subtracted a flat fee of up to 165,000 DKK in 2023, while for low-emission vehicles, the registration tax is discounted to 55 % of the full tax, and then subtracted a flat fee of up to 47,500 DKK. The discount consists of a lower rate and a higher tax deduction. These tax advantages will be reduced gradually towards 2030, but not to zero.

Car owners have to pay half-yearly ownership taxes which for new cars registered after July 1st 2021 are differentiated in accordance with the CO_2-emissions, while for older cars, the taxes are differentiated in accordance with the fuel efficiency expressed in kilometres per litre.

4.3.3.2 HFCs, PFCs, and SF_6 - taxes and duties relevant to these emissions

Since 1 March 2001, imports of industrial gases HFCs, PFCs, and SF_6 (F-gases) in the industry/business sector have been subject to taxation. The tax is differentiated in accordance with the global warming potential of the substance and was in 2001 equal to DKK 0.10 per kilogramme of CO_2 equivalents as the general principle and with DKK 400 per kilogramme as a general upper limit cf. the examples in Table 4.13.

As the taxes on industrial gases are based on the CO_2 tax, there was an increase in 2011, from DKK 0.10 per kilogramme of CO_2 equivalents to DKK 0.15, with DKK 600 per kilogramme as the upper limit, following the increased CO_2 tax rate shown in Table 4.11. The impact of this increase was expected to lead to a reduction in the emission of the industrial gasses of 0.02 million tonnes CO_2 equivalents.

There was a further increase in tax rates from July 1th 2021 by approximately 30 DKK per ton CO_2 equivalents, and tax rates are indexed in 2021 with 5.5 pct. and in 2024 with 3.6 pct., which is equivalent to an indexation of 1.8 pct. yearly in the period 2021-2025. Furthermore, the general upper limit of the tax rate of 600 DKK per kilogram was removed.

TABLE 4.13 EXAMPLES OF TAXES ON F-GASES, 2018 AND 2023
Source: Ministry of Taxation

Substance	GWP (AR4)	GWP (AR5)	Tax in DKK per kg 2018	Tax in DKK per kg 2023
HFC-134a	**1430**	**1300**	215	270
R404a (a combination of 3 HFCs)	**3922**	**3943**	588	738
SF_6	**22800**	**23500**	600	4,294

4.3.3.3 Tax on methane emissions from natural gas fired power plants - equal in terms of CO_2 equivalents to the CO_2 tax.

As of 1 January 2011, a tax on methane emissions - equal in terms of CO_2 equivalents to the CO_2 tax - from natural gas fired power plants was introduced. This is expected to reduce methane emissions from gas engines through behavioural changes such as changing from motor operation to boiler operation and establishing mitigation measures. Consumption is also expected to fall as the price of heat will increase. These behavioural changes will result in falls in the emissions of unburned methane from power stations. In addition, CO_2 emissions will fall and consumption of natural gas will fall. In total, a decline of 0.06 million tonnes CO_2 equivalent emissions in 2 out of 5 years is expected, corresponding to an average annual reduction effect of approximately 0.02 million tonnes CO_2 equivalent per year in 2008-12.

Table 4.14 contains an overview of all existing taxes and duties relevant to greenhouse gas emissions in Denmark.

TABLE 4.14 OVERVIEW OF TAX AND DUTY MEASURES

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in MtCO2e)**		Comments	Dimension(s)
Id	NECP_Pa rtId			- in national language									Related ?	No.					2020	2030		
1	1	Table 4.14	1-TD-01b: Mineral-oil Tax Act	Mineralolieafgiftsloven	Single	NA	Yes /	2: Energy consumption, 3: Transport	CO2, CH4, N2O	2_14: Demand management/reduction , 3_20: Demand management/reduction	No quantified objective	Economic, Fiscal	Non related	0	Implemented	Tax on mineral oil products in Denmark. The Mineral-oil Tax Act entered into force on 1 January 1993. Before this, the tax on petrol was regulated via the Petrol Tax Act, which entered into force on 1 January 1983, and the Act on Taxation of Gas Oil and Diesel Oil, Heating Oil, Heating Tar, and Crude Oil was regulated via the Act on Taxation of certain Oil Products, which entered into force on 3 October 1977. From 1 June 1999 a tax differentiation between light diesel and diesel low in sulphur was introduced, to encourage the use of diesel low in sulphur, which is less polluting than light diesel. This was accomplished and a change took place soon after to the effect that almost all diesel sold was low in sulphur. The purpose of further differentiation from 1 January 2005 favouring sulphur-free diesel was likewise to encourage the use of this type of diesel in favour of diesel low in sulphur, and this has been successful. In addition, tax differentiation has been introduced in order to achieve environmental goals other than direct reductions in greenhouse gas emissions. Thus tax differentiation has been introduced with a view to phasing out lead in petrol.	1993	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2020/1349	Decarbonisation: GHG emissions and removals
2	2		1-TD-02: Gas Tax Act	Gasafgiftsloven	Single	NA	Yes /	1: Energy supply, 2: Energy consumption	CO2, CH4, N2O	1_06: Efficiency improvement in the energy and transformation sector, 2_14: Demand management/reduction	No quantified objective	Economic, Fiscal	Non related	0	Implemented	Tax on consumption of natural gas and town gas in Denmark.	1996	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2020/1100	Decarbonisation: GHG emissions and removals
3	3		1-TD-03: Coal Tax Act	Kulafgiftsloven	Single	NA	Yes /	1: Energy supply, 2: Energy consumption	CO2, CH4, N2O	1_06: Efficiency improvement in the energy and transformation sector, 2_14: Demand management/reduction	No quantified objective	Economic, Fiscal	Non related	0	Implemented	Tax rated after the calorific value of coal, coke, furnace coke, coke gravel, crude coke, lignite briquettes and lignite, tall oil, wood tar, vegetable pitch etc.	1982	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2020/1099	Decarbonisation: GHG emissions and removals
4	4		1-TD-04: Electricity Tax	Elafgiftsloven	Single	NA	Yes /	1: Energy supply, 2: Energy consumption	CO2, CH4, N2O	1_06: Efficiency improvement in the energy and transformation sector, 2_14: Demand management/reduction	No quantified objective	Economic, Fiscal	Non related	0	Implemented	Tax on consumption of electricity. The electricity tax was introduced on 1 April 1977. With effect from 1 January 2013, the tax on electricity used for heating was reduced considerably, to take into account, that an increasing amount of renewable energy was being used in electricity production.	1977	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2020/1321	Decarbonisation: GHG emissions and removals
5	5		1-TD-05: CO2 tax on energy products	CO2-afgiftsloven	Single	NA	Yes /	1: Energy supply, 2: Energy consumption	CO2	1_06: Efficiency improvement in the energy and transformation sector, 2_14: Demand management/reduction	No quantified objective	Economic, Fiscal	Non related	0	Implemented	Tax on energy products depending on their contribution to CO2 emissions. The CO2 tax on energy products was introduced on 1 March 1992 and was imposed on different types of energy products relative to their CO2 emissions. From 1 January 2010 a structural change in the CO2 tax was implemented as an adaption to the EU Emissions Trading Scheme. The tax rate was increased to DKK 150 /tonne of CO2 indexed. In addition to this, there are CO2 taxes on heating tar, crude oil, coke, crude oil coke, lignite briquettes and lignite, LPG, and other gases. As of 1 January 2008 the CO2 taxes follow a yearly regulation of 1.8% in the period 2008-2015, similar to the energy taxes. From 2016 the tax is regulated with the consumer price index two years prior.	1992	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2020/1353	Decarbonisation: GHG emissions and removals
6	6		1-TD-06: Green Owner Tax - a fuel-efficiency-dependent annual tax on motor vehicles	Brændstofforbrugsafgiftsloven	Single	NA	Yes /	3: Transport	CO2, CH4, N2O	3_20: Demand management/reduction	No quantified objective	Economic, Fiscal	Related	4;2	Implemented	Car owners have to pay half-yearly taxes which for new cars from july 1st 2021 and onwards are differentiated in accordance with the expected CO2-emissions.	1997	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2021/1147	Decarbonisation: GHG emissions and removals
7	7		1-TD-07: Registration Tax - a fuel-efficiency-dependant registration tax on passenger cars and vans	Registreringsafgiftsloven	Single	NA	Yes /	3: Transport	CO2, CH4, N2O	3_20: Demand management/reduction	No quantified objective	Economic, Fiscal	Related	4;2	Implemented	The registration tax on motorised vehicles is calculated on basis of the value of the vehicle. Further an additional CO2 element is added to the tax, so the cars that have higher CO2-emissions also pay a higher tax. Passenger cars, light commercial vehicles and motorbikes are due to pay the registration tax. Further the registration tax is lower for zero- and lowemissions cars to support the uptake of these.	2000	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2022/785	Decarbonisation: GHG emissions and removals

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

TABLE 4.14 OVERVIEW OF TAX AND DUTY MEASURES (CONTINUED)

Interne oplysninger til EU rapporterings-formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.					2020	2030		
8	8		1-TD-08: Tax on HFCs, PFCs and SF6 - equivalent to the CO2 tax	Cfc-afgiftsloven	Single	NA	Yes /	4: Industrial processes	HFCs, PFCs, SF6	4_28: Replacement of fluorinated gases by gases with a lower GWP value	No quantified objective	Economic, Fiscal	Related	4;2	Implemented	Tax on HFCs, SF6 and PFCs. The tax is differentiated in accordance with the global warming potential of the substance with DKK 0.15 per kilogramme of CO2 equivalents as the general principle and with DKK 600 per kilogramme as a general upper limit.	2001	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/ita/2017/69	Decarbonisation: GHG emissions and removals
9	9		1-TD-09: Tax on methane from natural gas fired power plants - equivalent to the CO2 tax	En del af CO2-afgiftsloven, hvor metan-reduktion kan give godtgørelse af CO2-afgift efter §9d)	Single	NA	Yes /	1: Energy supply	CH4	1_05: Reduction of losses, 1_08: Control of fugitive emissions from energy production	No quantified objective	Economic, Fiscal	Related	4;2	Implemented	Tax on methane emissions from natural gas fired power plants - equal in terms of CO2 equivalents to the CO2 tax. As of 1 January 2011 a tax on methane emissions - equal in terms of CO2 equivalents to the CO2 tax - from natural gas fired power plants was introduced. This is expected to reduce methane emissions from gas engines through behavioural changes such as changing from motor operation to boiler operation and establishing mitigation measures. Consumption is also expected to fall as the price of heat will increase. These behavioural changes will result in falls in the emissions of unburned methane from power stations. In addition, CO2 emissions will fall and consumption of natural gas will fall. In total, a decline of 0.06 million tonnes CO2 equivalent emissions in 2 out of 5 years is expected, corresponding to an average annual reduction effect of approximately 0.02 million tonnes CO2 equivalent per year in 2008-12.	2011	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/ita/2020/1353	Decarbonisation: GHG emissions and removals
10	12		1-TD-12: Extension of low process electricity tax for charging electric and plug-in hybrid cars that subscribe to driving power through a business service until 2031	Forlængelse af lav proces-elafgift til opladning af el- og plug-in hybridbiler, der abonnerer på kørestrøm gennem en erhvervsmæssig tjeneste indtil 2031	Single	NA	Yes /	3: Transport	CO2	3_19: Electric road transport	No quantified objective	Economic	Related	2	Implemented	Extension of low process electricity tax for charging electric and plug-in hybrid cars that subscribe to driving power through a business service until 2030	2020	2050	Danish Ministry of Taxation	NE	IE		Decarbonisation: GHG emissions and removals
11	13		1-TD-13: Increase in CFC tax [enhancement of 1-TD-08]	Forhøjelse af CFC-afgift	Single	NA	Yes /	4: Industrial processes	HFCs, PFCs, SF6	4_28: Replacement of fluorinated gases by gases with a lower GWP value	No quantified objective	Economic, Fiscal	Related	2	Adopted	The tax on HFCs, SF6 and PFCs is increased by 1. july 2021. The taxrates for the gasses are increased by approximately 30 DKK pr. ton CO2e. The ceiling of the taxrate, which amounted to 600 DKK pr. kg, is removed. The taxrates are indexed in 2021 with 5.5 pct. and in 2024 with 3.6 pct., which is equivalent to an indexation of 1,8 pct. yearly in the period 2021-2025. The lower limit on taxation of import and manufactoring of gasses are removed. [enhancement of 1-TD-08]	2021	2050	Danish Ministry of Taxation	NA	IE		Decarbonisation: GHG emissions and removals
12	14		1-TD-14: Mileage-based toll for trucks	Kilometerbaseret vejafgift for lastbiler	Single	NA	Yes /	3: Transport	CO2	3_20: Demand management/reduction, 3_21: Improved behaviour	No quantified objective	Economic, Fiscal	Related	2	Adopted	The mileage-based toll for trucks will be in place from 2025.	2021	2050	Danish Ministry of Taxation	NA	IE		Decarbonisation: GHG emissions and removals

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

* Here “Yes” means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.4 Cross-cutting – Carbon Capture and Storage and Green Research

4.3.4.1 Carbon capture and storage

In 2022, Denmark adopted a so-called green tax reform with the objective of achieving a reduction of 4.3 million tonnes of CO_2 emissions annually by 2030. This green tax reform entails the introduction of a more consistent CO_2 tax structure. By 2030, companies outside the EU's Emissions Trading System (ETS) will face a uniform CO_2 tax rate of 750 DKK/tonne, while ETS companies will be subject to a CO_2 tax rate of 375 DKK/tonne. Notably, mineralogical processes, particularly subject to risks of carbon leakage, will be subject to a reduced tax rate of 125 DKK/tonne. As part of the reform, tax revenues generated would be allocated to support further reductions and removals, for example through Carbon Capture and Storage (CCS) initiatives. Approximately 17 billion DKK are expected to be allocated for a CCS funding scheme. The CCS funding scheme is expected to achieving reduction/removals of 1.8 million tonnes of CO_2 emissions annually by 2030.

Moreover, Denmark has introduced a funding scheme to develop and showcase the country's first full value chain for carbon capture, utilization, and storage (CCUS). The CCUS funding scheme has a total budget of 16 billion DKK from 2025 to 2049 and is expected to achieving a reduction/removals of 0.9 million tonnes of CO_2 emissions annually by 2030. In the first competitive bidding funding round completed in May 2023, Ørsted was awarded a 20-year contract to capture and store 0.43 mio. tonnes of CO_2 annually from 2026 by means of BECCS.

Furthermore, a funding scheme has been adopted aimed at achieving carbon removals (negative emissions) from technological sources. This funding scheme has a budget of 2.5 billion DKK from 2025 to 2032, and is expected to achieving removals of 0.2 million tonnes of CO_2 emissions annually by 2030. The initiative provides support for carbon removals from a variety of biogenic sources, which includes CO_2 captured from biogas being upgraded to biomethane (Bio-CCS), CCS with biomass-based energy production (BECCS), CCS on the biogenic fraction of CO_2 captured from waste incineration and industrial plants, as well as direct carbon capture from the atmosphere and storage (DACCS).

These initiatives are included in Table 4.15.

4.3.4.2 Green research

The allocation of research funding in Denmark’s government budget is subject to annual negotiation among the Parties in the Danish parliament, based on a proposal presented by the government.

In recent years, the Danish research and innovation policy has placed a strong emphasis on addressing climate challenges and contributing to the goals defined in the Danish Climate Act.

In 2024, the government and all other parties in the Danish parliament allocated DKK 4.2 billion for research and innovation as part of the public research budget of DKK 28.7 billion, which corresponds to 1 percent of GDP. To support the green transition, Denmark is earmarking DKK 2.6 billion for green research in 2024. Of

this, DKK 1.9 billion is aimed at supporting research in CO_2 storage, future plant-based foods and reduction of food waste, arctic research and climate, forecasting and knowledge about flooding and drought, and handling of PFAS.

TABLE 4.15 CROSS-CRUTTING MEASURES – CARBON CAPTURE AND STORAGE AND GREEN RESEARCH

Orange kolonner = Ekstra til EU		Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects																				
Interne oplysninger til EU rapporterings-formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action - in national language	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy Related ?	UnionPolicyList No.	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)** 2020	Estimate of mitigation impact (not cumulative, in ktCO2e)** 2030	Comments	Dimension(s)
Id	NECP_Pa mId																					
89	115	Table 4.15	0-CC-01: Funds for supporting capturing and storing CO2 (CCS)	115: Pulje til fangst og lagring af CO2 (CCS) [KEFM PAM F]	Single	NA	No /	1: Energy supply, 4: Industrial processes	CO2	1_07: Carbon capture and storage or carbon capture and utilisation	1.8 million tonnes of CO2 per year from 2030 onwards	Economic	Related	46	Adopted	In 2022, Denmark adopted a so-called green tax reform with the objective of achieving a reduction of 4.3 million tonnes of CO2 emissions annually by 2030. This green tax reform entails the introduction of a more consistent CO2 tax structure. By 2030, companies outside the EU's Emissions Trading System (ETS) will face a uniform CO2 tax rate of 750 DKK/tonne, while ETS companies will be subject to a CO2 tax rate of 375 DKK/tonne. Notably, mineralogical processes, particularly subject to risks of carbon leakage, will be subject to a reduced tax rate of 125 DKK/tonne. As part of the reform, tax revenues generated would be allocated to support further reductions and removals, for example through Carbon Capture and Storage (CCS) initiatives. Approximately 17 billion DKK are expected to be allocated for a CCS funding scheme between 2026 and 2043. The CCS funding scheme is expected to achieving reduction/removals of 1.8 million tonnes of CO2 emissions annually by 2030.	2026	2043	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals
91	124		0-CC-02: Market-based subsidy pool for capturing and storing CO2	124: Markedsbaseret tilskudspulje til fangst og lagring af CO2 [KEFM PAM Y]	Single	NA	Yes /	1: Energy supply, 4: Industrial processes	CO2	1_07: Carbon capture and storage or carbon capture and utilisation	0.9 million tonnes of CO2 per year from 2030 onwards	Economic	Related	46	Adopted	Denmark has introduced a funding scheme to develop and showcase the country's first full value chain for carbon capture, utilization, and storage (CCUS). The CCUS funding scheme has a total budget of 16 billion DKK from 2025 to 2049 and is expected to achieving a reduction/removals of 0.9 million tonnes of CO2 emissions annually by 2030. In the first competitive bidding funding round completed in May 2023, Ørsted was awarded a 20-year contract to capture and store 0.43 mio. tonnes of CO2 annually from 2026 by means of BECCS.	2025	2049	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals
92	127		0-CC-03: Technology-neutral funds for supporting CO2 capture etc.	127: Teknologineutral pulje til CO2-fangst mv. [KEFM PAM Æ]	Single	NA	Yes /	1: Energy supply, 4: Industrial processes	CO2	1_07: Carbon capture and storage or carbon capture and utilisation	0.5 million tonnes of CO2 per year from 2030 onwards	Economic	Related	46	Adopted	A funding scheme has been adopted aimed at achieving carbon removals (negative emissions) from technological sources. This funding scheme has a budget of 2.5 billion DKK from 2025 to 2032, and is expected to achieving removals of 0.5 million tonnes of CO2 emissions annually by 2030. The initiative provides support for carbon removals from a variety of biogenic sources, which includes CO2 captured from biogas being upgraded to biomethane (Bio-CCS), CCS with biomass-based energy production (BECCS), CCS on the biogenic fraction of CO2 captured from waste incineration and industrial plants, as well as direct carbon capture from the atmosphere and storage (DACCS).	2025	2032	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals
106	146		0-CC-04: Investment in green research, development, and demonstration.	146: Investering i grøn forskning, udvikling og demonstration jf. forskningsreserveaftalen for 2022 og 2023 - 2025. [UFM PAM A]	Single	NA	No /	3: Transport, 4: Industrial processes, 5: Waste management/ waste, 6: Agriculture, 7: LULUCF	CO2, CH4, N2O, HFCs, PFCs, SF6	3_24: Other transport, 4_29: Other industrial processes, 5_38: Other waste, 6_45: Other agriculture. , 7_56: Other land use, land-use change and forestry	No quantified objective	Economic	Related	2	Adopted	Investment in green research, development, and demonstration cf. the research reserve agreement for 2022 and 2023 - 2025. EUDP is reported separately (23 / 2-EN-06). The allocation of research funding in Denmark's government budget is subject to annual negotiation among the Parties in the Danish parliament, based on a proposal presented by the government. In recent years, the Danish research and innovation policy has placed a strong emphasis on addressing climate challenges and contributing to the goals defined in the Danish Climate Act. The 2022 budget includes a research reserve agreement of DKK 2.4 billion, with budgetary reservations extending from 2023 to 2025.	2022	2025	The Danish Ministry of Higher Education and Science	NA	IE		Decarbonisation: GHG emissions and removals

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

* Here "Yes" means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.5 Energy (Fuel Combustion, including Transport, and Fugitive Emissions from Fuels)

Greenhouse gas emissions from energy (as defined by the 2006 IPCC Guidelines for greenhouse gas inventories – i.e. from energy consumption and – in the case of Denmark – from flaring) made up 65.8% of Denmark's total greenhouse gas emissions in 2022 (with LULUCF), of which CO_2 was the primary emission. 97.7% of the emissions from the energy sector are CO_2. 1.3% is methane (CH_4), and the remaining 1.0% is nitrous oxide (N_2O).

4.3.5.1 CO_2

Energy production and energy-consuming activities in the transport sector and industry are main contributors to the total emissions of CO_2 due to use of coal, oil and natural gas. The energy sector is, therefore, centrally placed in efforts to reduce emissions of CO_2.

Many initiatives have been taken over the years to reduce the emissions, and work is still going on to find the best and most cost-effective measures with the objective to fulfil Denmark's international climate obligations.

Danish experience shows that through persistent and active energy policy focus on enhanced energy efficiency and conversion to cleaner and renewable energy sources, it is possible to sustain high economic growth and at the same time reduce fossil fuel dependency and protect the environment.

The energy sector is fully liberalised. Today, electricity production from Danish power plants is controlled by market forces. Danish electricity generation is traded freely across national borders on the Nordic and the north-German electricity markets. Thus there is a significant extent of integration in the Northern European electricity market. This entails, for example, that increased use of renewable energy in the Danish electricity system or enhanced efforts to save electricity do not automatically mean that generation at coal-fired power plants is reduced correspondingly during the first commitment period of the Kyoto Protocol 2008-2012.

In 2023, a pivotal result of the commitments was to end fossil fuel consumption by all large heart and powerplants and finalise the transition to sustainable sources of energy.

The introduction of the CO_2 allowance regulations through the EU emissions trading scheme (EU ETS) has been pivotal for Denmark’s ability to comply with the climate commitments. The EU ETS constitutes a central instrument in ensuring that the Danish energy sector is enabled to provide the emission reductions required if Denmark is to comply with its climate obligations. At the same time, the EU ETS permits significant improvements to the cost effectiveness of Denmark's climate effort.

The government’s long-term objective is to become a nation with an energy supply solely based on renewable energy sources and thus independent of fossil fuels.

The objective of the Danish energy policy today is security of supply, environmental concerns, energy savings and well-functioning energy markets within frameworks that secure cost effectiveness. Several initiatives often meet more than one of the purposes mentioned at the same time. Efforts concerning climate change should thus

be seen in a broader context than CO_2 alone, not least when it comes to the purpose and calculation of effects.

Denmark gave priority to renewable energy sources and energy efficiency early on. Most of the public support schemes and regulations have prioritised energy efficiency and renewable energy. In this respect the development in Denmark has been quite different from other IEA countries, which have invested in new energy supply – notably nuclear energy.

Danish public support programmes have instigated competition amongst private companies. Most public support for energy research and development in Denmark has been open for competing applicants. Similarly, all procurement of energy technologies induced by public schemes has followed EU rules requiring open tenders or has left it to competitive markets in general.

A large number of policies and measures have been implemented over the years to meet the various energy-policy objectives cf. Table 4.16.

4.3.5.1.1 The allowance regulation relevant to the energy sector

A key instrument for reaching the goals for emission reductions is the EU Emission Trading Scheme (EU ETS), which is a CO_2 allowance scheme for energy production and energy-intensive industries as described in section 4.3.1. The EU Member States have devised this trading scheme for greenhouse gas emissions in order to fulfil the international climate commitments set out in the Kyoto Protocol, in particular with the aim of reducing CO_2 emissions from energy production and energy-intensive industries.

The allowances scheme entered into force on 1 January 2005. The 2005-2007 period was used as a testing phase. The EU ETS Directive has been revised a number of times.

The allowance allocation for 2008-2012 was determined on the basis of the national allocation plan from July 2006, submitted the European Commission. The EU ETS 2008-2012 has been an important measure in Denmark's fulfilment of its climate obligations under the first commitment period of the Kyoto Protocol. The scheme aligns well with government policy for the energy area on liberalisation of the energy markets and management of environment efforts by the market.

The installations subject to the allowance regulations account for a little less than half of Danish emissions of greenhouse gases. Almost all major Danish installations with considerable emissions are covered by the ETS. Most of these are generators of power and heat, the rest are industrial enterprises plus a few production units within the offshore sector.

Both the statutory and the administrative basis for the scheme have been established. The necessary legal basis was adopted by the Danish parliament “Folketinget” in June 2004 and the 2008-2012 national allocation plan was approved by the European Commission on 31 August 2007.

According to the national allocation plan for the period 2008-2012 an average annual allowance of 24.5 million tonnes CO_2 has been allocated. According to the allocation plan this should correspond to a drop in annual emissions of about 5 million tonnes per year in 2008-2012, or a reduction of about 17% compared with emissions expected in the national allocation plan for the period. This level was set by balancing environmental considerations against competitiveness and jobs:

- Electricity and heat producers were allocated about 15.8 million EAUs. The allowance for electricity generation is allocated as ”per kWh”, while for heat production allowances are allocated according to emissions in the base years 1998-2004.

- The other 133 installations (industry and offshore) have been allocated allowances corresponding to emissions in the base years 1998-2004. A total of 8.2 million tonnes CO_2 per year have been allocated to industry and offshore.

- A special reserve of 0.5 million tonnes CO_2 per year has been allocated with free allowances for new installations and significant extensions to existing units.

Allowances not allocated by the end of the commitment period or returned due to closures have been auctioned. The period 2008 – 2012 was finalized in 2013 with the final surrendering of allowances and credits by companies participating in the EU ETS as shown in section 4.3.1.

The new EU Climate and Energy Agreement from December 2008 extended the ETS system to 2013-2020 in order for the EU to reduce CO_2 emissions by 20% in 2020. At the same time allocation was centralised and auctioning is to be used more extensively from 2013. As a result of reducing free allocation throughout the period those allowances were mainly referred to EU member states and auctioning. The allowances have been calculated for this period in accordance with the EU benchmarking decision 2011/278/EU.

The legislative framework of the EU ETS for its next trading period 2021-2030 (phase 4) was revised in early 2018 to enable it to achieve the EU's 2030 emission reduction targets in line with the 2030 climate and energy policy framework and as part of the EU's contribution to the 2015 Paris Agreement.

The Fit for 55 package, endorsed on 8 February 2023 by the Permanent Representatives Committee, proposes to revise several pieces of EU climate legislation, including the EU ETS, setting out in real terms the ways in which the Commission intends to reach EU climate targets under the European Green Deal. The revised EU ETS Directive, adopted 5 June 2023 and applied from 1 January 2024 will enable this through a mix of interlinked measures - e.g. a mayor revision of EU ETS as well as inclusion of ETS Maritime and ETS Transport, Building and Industries.

4.3.5.1.2 Energy and CO_2 taxes

Taxes have also been used for many years as an instrument to reduce CO_2 emissions from the energy sector, since fuels used for heat production are subject to energy and CO_2 taxes. The main objective is general GHG reductions and the promotion of the use of fuels with lower CO_2 emissions, mainly biomass. Energy and CO_2 taxes are described in detail in section 4.3.3.

4.3.5.1.3 Combined heat and power and liberalisation of waste incineration

The main elements of the Danish strategy to promote renewable energy and the efficient use of energy resources since the end of the 1970s have been increased use of CHP and expanding of district heating areas. Effective heat supply planning has ensured the highest share of district heating and CHP in the Western Hemisphere. This has secured early markets for district heating technologies and a possibility for

the use of many renewable energy sources like straw, municipal waste, wood waste and geothermal energy. CHP plants produce about 36% of Denmark's domestic electricity consumption, and the potential for further use of CHP is limited. Wind energy delivered about 53% of domestic electricity supply in 2021. Consequently, CHP production will decrease in the future, though CHP and the valuable services CHP plants provide - also in terms of back up capacity – will remain an integral part of the overall system.

Historically, CHP has been promoted in various ways, e.g. through favourable taxation schemes, and an obligation for consumers to connect to district heating systems, should they be rolled out in consumer areas. These were important schemes for expanding district heating in Denmark. However, due to an update to EU's state aid rules, the so-called "base subsidy" for decentral CHP plants was revoked in 2018, causing great change to the heating sector. The 2018 Energy Agreement aimed to modernise the heating sector and mitigating the impacts of eliminating the "base subsidy".

Regulatory constraints on the heat production of district heating plants were eliminated, giving them the freedom to invest in transitions to greener energy, e.g. heat pumps, biomass and geothermal systems, thus enabling the transition towards a renewable energy system. The regulatory relief for individual district heating plants depends on the size of their district heating areas. The last constraints are expected to be lifted by 2030 at the latest.

The 2018 Energy Agreement gave consumers a greater freedom of heating choice. The power to obligate consumers to be connected to the collective heating system was abolished. This allowed for investment in other individual heating solutions, e.g. heat pumps for single homes.

No new consumer obligations are permitted as from January 2019.

The purpose of the modernisation was to ensure that the district heating sector remained viable without public subsidies. In the short term, the elimination of this base subsidy may cause higher heating bills for some consumers. Therefore, the energy agreement also allocated DKK 540 million in the period 2018-2023 for targeted efforts to help heating plants and consumers, and to help manage stranded costs.

In 2020, Denmark adopted a new energy agreement where one of the initiatives targeted the transition to green district heating. With the agreement came a series of changes to the regulation of the heating sector that affected combined heat and power plants.

With the agreement, the cogeneration requirement was repealed, meaning that there is no longer a requirement for heat production facilities in central areas to have to be established as cogeneration. Furthermore, the fuel-binding requirement for the natural gas-based district heating areas was repealed, meaning that there is no longer a requirement for the cogeneration plants in these areas to produce heat/power with natural gas and/or oil. The purchase obligation for natural gas was repealed, while the purchase obligation for district heating was modernized. The modernization meant that the purchase obligation for district heating does not apply if a central heating plant's utilization of its own excess heat or production of renewable energy is more economically advantageous than district heating. Lastly, an adjustment to the socioeconomic requirement for new or refurbished heating plants was repealed, meaning that the project approving authority could choose not to compare the

projects socio economy with fossil-based alternatives, to advance the establishment of green heating projects.

In 2022, Denmark again adopted a new energy agreement of which two initiatives will affect the combined heat and power plants. With the agreement, Denmark is working towards a complete prohibition against the approval of new projects for heat-only technologies that use fossil fuels as main fuel for base, upper base and peak loads for district heating. Only reserve or emergency load units are exempted.

As all waste incineration plants in Denmark have energy recovery, primarily heat for district heating, emissions from waste incineration are reported under the IPCC catgory "Energy" (i.e. not under "Waste"). However, in Denmark, the waste sector is treated as one economic sector. Although CO_2 emissions from waste incineration are included under the EU ETS, additional national efforts have been made to seek to reduce these emissions. On June 16, 2020, the Danish Government and Parties representing a broad majority in the Danish Parliament entered into an agreement on a '*Climate plan for a green waste sector and a circular economy*'. As a follow-up to this plan, a supply-based model for waste incineration in Denmark was adopted by a majority in the parliament in June 2023. It was estimated that the implementation of this supply-based model will reduce CO_2 emissions from waste incineration in Denmark.

4.3.5.1.4 Renewable energy

The increasing use of renewable energy sources is reducing emissions of CO_2 from fossil fuels. The long term goal for the Danish government is to be a climate neutral society by 2045.

In Climate Projection 2024, the estimates for 2030 are the following: approximately 74% renewable energy in gross energy consumption; approximately 111% of electricity consumption to be supplied by renewable energy; gross energy consumption will remain stable towards 2030; and by 2030 greenhouse gas emissions will be reduced by 68% compared to 1990.

The expansion of energy from renewable sources will – according to the Climate Projection 2024 ensure that 68% of the nation's energy needs are met with renewable energy by 2030.

Onshore wind power and solar photovoltaic power
Electricity production from onshore wind and solar has historically been supported by various support schemes. Most recently, Denmark has carried out technology neutral tenders from 2018 to 2021 where onshore wind, solar PV and open-door offshore wind projects could compete for the lowest possible support. With the Climate Agreement from June 2022, the parties behind the agreement decided to discontinue the technology neutral tenders and it is expected that onshore wind and solar projects will be installed subsidy-free going forward. In the 2022 agreement the parties also decided to ensure framework conditions that can enable a fourfold increase in total electricity production from solar energy and onshore wind by 2030.

Since 2018 Denmark has supported installation of R&D onshore wind turbines with the aim of supporting the technological development of wind energy and ensuring continued development activities. With the Climate Agreement on Green Electricity and Heating from June 2022, the parties decided to change the support for experimental wind turbines in 2023-2024 from operational support to investment

support as recommended in the Experimental Wind Turbine Analysis from 2021. In 2023, a majority in the parliament adopted a proposal to change from operational support to investment support for experimental wind turbines. The investment support pool for experimental wind turbines on land in 2023 opened on August 15, 2023 and closed on November 15, 2023. Denmark is continuously working to support and ensure good framework conditions for the testing of experimental wind turbines, which can enhance the industry's opportunities to bring new types of wind turbines to the market. Currently, an environmental and habitat impact assessment is being prepared for the expansion and adaptation of the Østerild test center. If the expansion of Østerild is adopted, it will provide wind turbine manufacturers with test sites for larger wind turbines of up to 450 meters. Additionally, it has been decided to adapt the Høvsøre test center by decommissioning two of the total seven sites to enable the testing of prototype wind turbines of up to 275 meters in height on the remaining five sites.

Offshore wind power

Since 2012, a number of political agreements have been concluded regarding offshore wind energy in Denmark. The agreements are *the 2012 Energy Agreement*, *the 2018 Energy Agreement*, *the 2020 Climate Agreement for Energy and Industry*, *the 2021 Additional Agreement on ownership and construction of the Energy Islands etc*., the 2021 and 2022 underlying tender preparing Partial Agreements, *the 2022 Additional Agreement for Energy Island Bornholm*, *the Finance Act of 2022, the 2022 Climate Agreement* and *the May 2023 Additional agreement on tender requirements for 6 GW OWF and Energy Island Bornholm*.

In accordance with *the 2012 Energy Agreement* the two Offshore Wind Farms (OWFs) Horns Rev 3 (407 MW) and Kriegers Flak (604 MW) has been fully commissioned in August 2019 and September 2021. Furthermore, the nearshore wind farms from *the 2012 Energy Agreement*, Vesterhav Syd (170 MW) and Vesterhav Nord (180 MW) are fully commissioned in late 2023 and early 2024, respectively.

In *the 2018 Energy Agreement*, it was decided to establish three new OWFs towards 2030. The first OWF, Thor Havvindmøllepark (1000 MW), has finalized the tender process and is expected fully commissioned in 2027. The second OWF, Hesselø Havvindmøllepark, is delayed due to challenging seabed but is expected fully commissioned in 2030 with a capacity between 800 – 1.200 MW. The agreeing parties of *the 2020 Climate Agreement* decided that the third OWF is a part of the coming Energy Island Bornholm.

In *the 2020 Climate Agreement* it was decided to establish two Energy Islands with connected OWFs. One in the North Sea (10 GW) and one in the Baltic Sea (2 GW) on Bornholm. *The 2022 Additional Agreement for Energy Island Bornholm* expanded the capacity for Energy Island Bornholm with an additional 1 GW to a total of 3 GW. The Energy Island Bornholm is expected fully commissioned in 2030 and the 3 GW of the North Sea Energy Island is expected fully commissioned in 2033. *The 2020 Climate Agreement* stipulates a long-term ambition of minimum 10 GW connected to the North Sea Energy Island.

The Finance Act of 2022 further stipulated an additional tendering of 2 GW offshore wind energy. One of the 2 GW is placed at Energy Island Bornholm cf. *the 2022 Additional Agreement for Energy Island Bornholm*.

The 2022 Climate Agreement decided additional tendering of minimum 4 GW offshore wind energy with commissioning in 2030.

Furthermore, the Danish Government has granted permits to establish Frederikshavn OSW. The project will have a capacity of 72 MW.

In May 2023, *the Additional agreement on tender requirements for 6 GW OW and Energy Island Bornholm* decided the tender requirements of 6 GW off-shore wind and 3 GW related to Energy Island Bornholm. Furthermore, this agreement allows overplanting and thus the potential for collectively 14 GW or more. The agreement enables that the tender process can begin, with the political aim of full commission of the collective 9 GW OW in 2030 and two years later for overplanted capacity.

Biomass
In 2022, biomass accounted for approximately 63% of renewable-energy production, mostly in the form of straw, wood pellets, wood chip and biodegradable waste for incineration. Approximately 38% of the biomass was imported, mainly in the form of wood pellets (45 PJ) and wood chips (20 PJ).

The energy production from biomass has more than doubled since 1990 - primarily due to the policy agreement from 1993 (the Biomass Agreement: requires power plants to use 1.4 million tonnes of straw and wood, equivalent to almost 20 PJ per year) and the policy agreement from February 2008 on the increased use of straw and chips at the large co-generation plants (up to 700,000 tonnes in 2011). In recent years, the consumption have stabilised.

Liquid biofuels, such as animal and vegetable oils, biodiesel and bioethanol, are used only on a small scale. Liquid biofuels from bio-waste by the so-called second-generation technologies are at a low level.

4.3.5.1.5 Fuel conversion from coal to natural gas

Substitution of coal and oil by natural gas reduces emissions of CO_2. The first Danish natural gas was landed from the Danish sector of the North Sea in 1984, and since then consumption of natural gas has increased to 193 PJ in 2001. Since then, consumption has decreased to 92 PJ in 2021 due mainly to high gas prices. In 2021, natural gas covered 13% of gross energy consumption. In the power sector, natural gas was introduced in 1985 and peaked with 25% around 2000. In 2021, this had decreased to 4%, mainly due to the relation between power prices and gas prices. The use of natural gas is expected to decrease further as a result of introducing more renewable energy and extensive energy-saving policies.

In 2021, a new gas strategy was published. The strategy explores the potential of biogas and other green gases and lay the foundation for achieving a 100% green gas system in Denmark, thus contributing to a climate-neutral Denmark by 2050 at the latest cf. the Danish Climate Act.

The gas crisis in 2022 played a significant role in reshaping energy consumption patterns, leading to a substantial 22% reduction in natural gas demand from August 2022 to March 2024 compared to the average consumption in 2017-2022. This period showed a concerted effort to reduce reliance on traditional natural gas, paving the way for alternative sources. Currently, biomethane holds a 37% share in the gas system, and the latest national climate projections estimates the share will rise to 100% by 2029 (in consumption terms over 100% as export is projected).

4.3.5.1.6 Research and development

Danish support for new energy technologies has been comprehensive and relatively stable. A long list of direct and indirect support schemes and policies have, in combination, created a domestic market which has given Danish companies a boost. This boost has enabled many companies to become international market leaders. Danish companies continue to enjoy commercial success within the energy-related marketplace.

R&D activities include energy savings, more efficient energy conversion, renewable energy technologies, Power-to-X, CCUS and efforts within System Integration and Smart Energy.

Research and development activities in the field of energy are not motivated solely by climate issues, but are relevant to climate issues, since they contribute to determining the overall framework for the CO_2 intensity of energy production and consumption in the future.

There is a broad political commitment to support R&D activities through public funding.

Thus Denmark has chosen to strengthen the dedicated public investments in clean energy research, development and demonstration focusing on reduction of technology costs and CO_2 emissions and with an emphasis on innovative projects that can be replicated and scaled up with the involvement of private investors. There are two major public funding instruments within energy technology.

The EUDP programme was established in 2008 and since then the programme has supported more than 1200 projects with a total of DKK 6 billion. On average, 45-50% of the activities under the Programme are financed by the EUDP and hence the private investments in the supported projects are of the same size as the public support leading to approximately to DKK 12 billion in total investments. The Danish Parliament has dedicated DKK 500 million for EUDP for the fiscal year 2022.

Activities relating to strategic research and innovation in general are since 2014 administrated by Danish Innovation Fond. The Fund covers all sorts of research and innovation projects and is not limited to energy matters. However, for 2023 at least DKK 320 million will be earmarked for R&D within new and clean energy technologies.

Four research missions have been launched in 2021. Three of them are related to the energy and climate field in themes like CCUS, Green Fuels and Environmental friendly Agriculture. They are now established as partnerships. In 2023, the public funding is DKK 300 million.

A minor programme, ELFORSK, is administrated by the Danish Energy Agency in collaboration with the Danish energy association Green Power . The objective is to support research and development of efficient energy use and flexibility solutions within electricity and energy via data, digitization and sector coupling in accordance with environmental and socio-economic considerations, including the dissemination of methods, solutions, analyses and models. The annual funds for this programme are DKK 25 million.

Intensifying energy and climate research as we move towards 2030 will ensure continued efforts to develop the technologies that will help Denmark's energy system transition to cleaner and greener solutions. Research and development in new energy

and climate technology solutions will also generate new opportunities for growth, jobs and Danish technology exports.

The research funding will support Denmark's commitment to the international collaboration Mission Innovation, in which a number of countries have pledged to increase energy research funding by 2020. With an ambitious funding target of 1 billion DKK from 2024 onwards, Denmark further cements its long-term commitment to research, development and demonstration in the field of energy and climate. Through Danish initiatives such as the Energy Technology Development and Demonstration Program (EUDP) and Innovation Fund Denmark, Denmark is contributing to the global cooperation to develop the energy and climate technologies of tomorrow.

The EUDP funding will support the development and demonstration of Danish energy technology solutions, with a view to subsequent commercialisation. These solutions may range from new floating foundations for offshore wind turbines, to large scale demonstration projects such as Greensand, which injects CO_2 in the deployed oil fields in the North sea.

Strategic and applied energy research is among the many activities supported by Innovation Fund Denmark. This funding is awarded directly to talented researchers, entrepreneurs and companies, as well as to others with strong ideas about energy technology solutions for the benefit of society.

4.3.5.1.7 Energy savings

Reducing energy consumption by increasing energy efficiency and promoting energy saving is a very important element for Danish energy policy.

Among the grid and distribution companies (electricity, natural gas, oil and heating), the electricity companies have been working with energy savings since the early 1990s and the natural gas and district heating companies have been working with energy savings since 2000.

The Energy Efficiency Obligation Scheme
Since 2006, several political agreements have been reached to significantly strengthen the energy savings efforts in Denmark.

The obligations have been implemented as voluntary agreements between the energy minister and grid and distribution companies under the Energy Efficiency Obligation Scheme (EEO). The companies' costs are financed by a levy on their tariffs.

In the policy agreement from 2012, the obligation for the grid and distribution companies in the electricity, natural gas, district heating and oil sectors was increased by 75% in 2013 and 2014 (to 10.7 PJ) and by 100% in 2015 (to 12.2 PJ). In December 2016, the Minister of Energy, Utilities and Climate entered a new agreement on energy savings with the grid and distribution companies for the period 2016-2020. The obligation was decreased from 12.2 PJ to 10.1 PJ in 2016 to 2020. Following from a political agreement, the EEO was discontinued by the end of 2020 and replaced with new policy measures

Political Agreements directed towards energy efficiency / energy consumption
In May 2020, a political agreement to ensure green renovation of the social housing sector in 2020 and from 2021-2026 was reached. The agreement entails a structural shift in the Danish National Building Fund's support system containing a new green support criterion, a new green guarantee and a trial scheme for sustainable projects that will improve the energy efficiency of buildings in the social housing sector.

In June 2020, the Danish Climate Agreement for Energy and industry 2020 was reached. The agreement includes measures, which are expected to procure sizeable energy savings, which contributes to the fulfilment of the energy savings obligation. Policies include a substantial expansion and advancement of the subsidy scheme related to private enterprises, of the subsidy scheme related to residential buildings and the subsidy scheme to replace oil boilers with heat pumps in buildings outside the district heating and gas grids. Furthermore, the agreement includes funds for a focused energy efficiency effort in the period 2021-2030.

In December 2020, the political agreement A Green Transition of the Transport sector was reached. The agreement includes among other a reorganization of the current taxation of cars so that users have a greater incentive to choose electric cars over conventional fossil fuel technology.

In December 2020, an agreement on the state budget law for 2021 and on Stimuli and Green Recovery was reached. Along with other initiatives funds from 2021 and forward for a subsidy scheme, that provides subsidies to energy efficiency in regional and municipal buildings, incl. renovations, conversions from oil and gas boilers to heat pumps or district heating and digital solutions are allocated.

In December 2020 and again in June 2022, an agreement on a Green Tax reform was reached, which includes an increase in energy taxation on business energy consumption for process purposes. Inhere there are also allocated further funds for the for the competitive subsidy scheme related to private enterprises. With the agreement in 2022, it was agreed that energy taxes should be restructured to reflect CO_2-emissions. Starting 2025 and fully phased in by 2030, a tax will be set directly targeting CO_2-emissions which by 2030 will cost DKK 750 per tonnes of CO_2 for non-ETS businesses and DKK 375 per tonnes of CO_2 for ETS businesses, excepting businesses with mineralogical processes – these businesses will pay a tax of DKK 125 per tonnes of CO_2 emitted in 2030.

With the political agreements on Winter Help (2022) and Inflation Help (2023), budget law for 2024, and the agreement on Partial Disbursement of Green Fund 2024, further funds have been added to existing measures, among others those targeting conversions from oil and gas boilers to heat pumps or district heating, and those supporting the rollout of district heating and decoupling from the gas grid.

In March 2023, with the agreement for a new kilometre-based toll for trucks and with a higher tax on diesel consumption included in the political agreement Partial Disbursement of Green Fund 2024, further savings in the transport sector is also expected. Both will be phased in from 2025 onwards.

In June 2024, the government announced a *Roadmap for energy efficiency*, by which the government has taken the initial step towards a new understanding of energy efficiency to be used as the starting point when the future framework for energy efficiency is to be discussed with the industry and the parliament. A pillar in the roadmap is that energy consumption must match energy production. This means, that the green energy must be used when it is in abundance, e.g. when the wind blows and the sun shines. Conversely, consumption must be able to be reduced when green energy is lacking. The goal is that, with increased digitization and greater focus on flexibility, it should be able to run completely by itself.

In the coming years, more energy efficiency measures will be continuously implemented as a part of the roadmap. Among other things, there will soon be an announcement on excess heat, a supply plan is under way, and it is being clarified

continuously how Denmark will implement the new requirements from the energy efficiency directive and the building directive. In addition, electrification of energy supply and demand will continue

4.3.5.1.8 Stop for oil and gas extraction in the North Sea

In December 2020, a broad majority in the Danish Parliament reached a deal on the future of fossil extraction in the North Sea, which established a final phase-out date of fossil extraction by 2050 and led to the cancellation of the 8th licensing round and all future tender rounds to extract oil and gas. The deal also included a reduction of the area where oil and gas exploration and production is allowed in Denmark to the western most part of the Danish North Sea.

The agreement sets the direction towards a climate neutral Denmark and a complete phase-out of fossil fuel production by 2050, while simultaneously confirming the remaining regulatory framework to ensure stability and clear line of sight for the industry and safeguard employment in the impacted regions.

The main elements of the agreement includes the following:

- A 2050 cutoff date for all oil and gas extraction.
- A cancellation of the 8th licensing round and all future licensing rounds.
- A reduction of the area for oil and gas extraction to the western most part of the North Sea.
- Explore the possibilities of electrification of the oil and gas facilities offshore.
- A commitment to lead a global campaign on the role of fossil fuel producing countries.
- A just transition initiative in the affected region to ensure development and employment.
- Confirming the remaining regulatory framework to ensure stability, including access to two other existing licensing schemes. However any such permits would still have to adhere to the 2050 end date and can not be initiated by the government with a call for tender.
- An initiative to explore the potential of carbon capture and storage, using old oil and gas wells. DKK 200 million were allocated with the agreement through the "Energy Technology Development and Demonstration Program" (EUDP) for the development and demonstration of CO_2 storage in the North Sea.

TABLE 4.16 MEASURES IN THE ENERGY SECTOR (SEE ALSO SPECIFIC ENERGY MEASURES IN TABLE 4.17 (BUSINESS), 4.18 (HOUSEHOLDS) AND 4.19 (TRANSPORT))

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NCh, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mid			- in national language									Related ?	No.						2020	2030		
15	19	Table 4.16	2-EN-01: EU-CO2-emission trading scheme for electricity and district heat production and certain industrial processes (incl. Business) and aviation from 2012 (EU ETS) From 2024 EU ETS also covers the maritime sector and from 2025 ETS2-sectors including buildings, road transport and additional sectors	EU's kvotehandels direktiv	Single	NA	Yes /	1: Energy supply, 3: Transport, 4: Industrial processes; 2: Energy consumption	CO2	1_01: Increase in renewable energy sources in the electricity sector, 1_02: Increase in renewable energy in the heating and cooling sector, 1_03: Switch to less carbon-intensive fuels, 1_05: Reduction of losses, 1_06: Efficiency improvement in the energy and transformation sector, 3_23: Reduce emissions from international air or maritime transport, 4_27: Improved control of manufacturing	A climate-neutral EU by 2050 and the intermediate target of an at least 55% net reduction in greenhouse gas emissions by 2030. To achieve the EU's overall greenhouse gas emissions reduction target for 2030, the sectors covered by the EU Emissions Trading System (EU ETS) must reduce their emissions by 43% compared to 2005 levels.	Regulatory, Economic	Related	3;46	Implemented	A key instrument for reaching the goals for emission reductions is the EU Emission Trading Scheme (EU ETS), a cap and trade based CO2 allowance scheme for energy production and energy-intensive industries. The EU Member States progress with this trading scheme for greenhouse gas emissions in order to fulfil the international climate commitments set out in the Kyoto Protocol and Paris agreement, aiming to reduce CO2 emissions from covered installations and flights. The installations subject to EU ETS covers about half of Danish emissions of greenhouse gases. Statutory and administrative basis for the scheme have been established. Allowances prices have particular significance for Danish emissions as they affect the need to initiate other mitigation initiatives. Introducing the Marked Stability Reserve has had major impact on price levels thus supporting national efforts. Efforts to further increase the level of ambition in EU climate policy are key in the Danish government's climate change policy to achieve ambitious national targets. The legislative framework of the EU ETS (2021-2030) was revised in 2018 and 2023 to enable it to achieve the EU's 2030 emission reduction targets.	2005	2050	The Danish Energy Agency	NE	IE		Decarbonisation: GHG emissions and removals
16	20		2-EN-02: Biomass Agreement (Agreement on the use of biomass in electricity production)	Biomasseaftalen	Single	NA	Yes /	1: Energy supply	CO2	1_01: Increase in renewable energy sources in the electricity sector	Not quantified	Economic, Other (Voluntary/negotiated agreements)	Related	4;2	Implemented	In 2022, biomass accounted for approximately 63 % of renewable-energy production, mostly in the form of wood pellets, wood chip, straw and biodegradable waste for incineration. In 2022 approximately 38 % of the biomass was imported, mainly in the form of wood pellets, wood chips, fire wood and biodegradable waste. The energy production from biomass has more than doubled since 1990, and the consumption has now stabilized.	1993	2050	The Danish Energy Agency , Entities under the EU ETS	NE	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
17	21		2-EN-03: Price supplement and subsidies for renewable energy production	Pris-supplement og tilskud til produktion af vedvarende energi	Single	NA	Yes /	1: Energy supply	CO2	1_01: Increase in renewable energy sources in the electricity sector	Not quantified	Economic	Related	4;2	Implemented	The Danish state grants subsidies for renewable energy production from wind, solar and bio energy. From 2022 subsidies are financed on the Danish state budget and will replace the financing current Public Service Obligation (PSO) levied on domestic energy consumption which is being phased out. New RE installations in Denmark are primarily subsidised through tender based schemes where developers compete for a limited susidy budget. The different subsidy schemes contribute to increase the RE share in the Danish energy consumption.	2008	2050	The Danish Energy Agency , Entities under the EU ETS	NE	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
18	22		2-EN-04: Tenders for offshore wind turbines	Udbud af off-shore vindmølleparker	Single	NA	Yes /	1: Energy supply	CO2	1_01: Increase in renewable energy sources in the electricity sector	Not quantified	Regulatory	Related	4;2	Implemented	In accordance with the 2012 Energy Agreement the two Offshore Wind Farms (OWFs) Horns Rev 3 (407 MW) and Kriegers Flak (604 MW) has been fully commissioned in August 2019 and September 2021. Furthermore, the nearshore wind farms from the 2012 Energy Agreement, Vesterhav Syd (170 MW) and Vesterhav Nord (180 MW) are expected fully commissioned in 2023. In the 2018 Energy Agreement , it was decided to establish three new OWFs towards 2030. The first OWF, Thor Havvindmøllepark (1000 MW), has finalized the tender process and is expected fully commissioned in 2027. The second OWF, Hesselø Havvindmøllepark, is delayed due to challenging seabed but is expected fully commissioned in 2029 with a capacity between 800 – 1.200 MW. The agreeing parties of the 2020 Climate Agreement decided that the third OWF is a part of the coming Energy Island Bornholm. In the 2020 Climate Agreement, it was decided to establish two Energy Islands with connected OWFs. One in the North Sea (10 GW) and one in the Baltic Sea (2 GW) on Bornholm. The 2022 Additional Agreement for Energy Island Bornholm expanded the capacity for Energy Island Bornholm with an additional 1 GW to a total of 3 GW. The Energy Island Bornholm is expected fully commissioned in 2030 and the 3 GW of the North Sea Energy Island is expected fully commissioned in 2033. The 2020 Climate Agreement stipulates a long-term ambition of minimum 10 GW connected to the North Sea Energy Island. The Finance Act of 2022 further stipulated an additional tendering of 2 GW offshore wind energy. One of the 2 GW is placed at Energy Island Bornholm cf. the 2022 Additional Agreement for Energy Island Bornholm. The 2022 Climate Agreement decided additional tendering of minimum 4 GW offshore wind energy with commissioning prior 2030. Furthermore, the Danish Government has granted permits to establish Frederikshavn Havvindmøllepark and Aflandshage Havvindmøllepark with a total capacity of 72 MW. In May 2023, the Additional agreement on tender requirements for 6 GW OW and Energy Island Bornholm decided the tender requirements of 6 GW off-shore wind (OW) and 3 GW related to Energy Island Bornholm. The May 2023 agreement, furthermore allows overplanting and thus the potential for collectively 14 GW or more. The agreement enables that the tender process can begin, with the political aim of full commission of the collective 9 GW OW in 2030 and two years later for overplanting.	2013	2050	The Danish Energy Agency , Entities under the EU ETS	NE	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

TABLE 4.16 MEASURES IN THE ENERGY SECTOR (SEE ALSO SPECIFIC ENERGY MEASURES IN TABLE 4.17 (BUSINESS), 4.18 (HOUSEHOLDS) AND 4.19 (TRANSPORT)) (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action - in national language	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Parnld												Related ?	No.						2020	2030		
19	23		2-EN-06: Energy development and demonstration	Energi Udvikling og Demenstrations Programmet (EUDP)	Single	NA	Yes /	1: Energy supply	CO2, CH4, N2O	1_01: Increase in renewable energy sources in the electricity sector, 1_02: Increase in renewable energy in the heating and cooling sector, 2_14: Demand management/reduction	Not quantified	Information	Related	4;2	Implemented	Danish support for new energy technologies has been comprehensive and relatively stable. The creation of a domestic market has given Danish companies a boost. This boost has enabled many companies to become international market leaders. . R&D activities include energy savings, more efficient energy conversion, renewable energy technologies and efforts within System Integration and Smart Energy. The Danish Energy Technology Development and Demonstration Programme (EUDP) was established in 2007 and since then the programme has supported more than 1000 projects with a total of DDK 5 billion. On average, 50% of the activities under the Programme are financed by the EUDP and hence the private investments in the supported projects are of the same size as the public support leading to approximately to DKK 10 billion in total investments. In 2018, the energy and climate research was strengthened with the 2018 Energy Agreement with the intention to phase in additional state funding going from 580m DKK in 2020 to a target of 1 billion DKK annually from 2024. The research funding will support Denmark's commitment to the international collaboration Mission Innovation. With a funding target of 1 billion DKK from 2024 onwards, Denmark further cements its long-term commitment to research, development and demonstration in the field of energy and climate.	2008	2050	The Danish Energy Agency	NE	IE		Decarbonisation: GHG emissions and removals
20	24		2-EN-07: Liberalization of waste incineration plants	Konkurrenceudsættelse af forbrændingskapacitet	Single	NA	Yes /	1: Energy supply, 7: Waste management/ waste	CO2, CH4, N2O	1_05: Reduction of losses, 5_31: Enhanced recycling	Not quantified objective	Regulatory	Related	2	Adopted	On June 16, 2020, the Danish Government and Parties representing a broad majority in the Danish Parliament entered into an agreement on a 'Climate plan for a green waste sector and a circular economy'. As a follow-up to this plan, a supply-based model for waste incineration in Denmark was adopted by a majority in the parliament in June 2023.	2025	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE	Link to legislation: https://www.ft.dk/samling/20222/lovforslag/l115/index.htm	Decarbonisation: GHG emissions and removals
21	25		2-EN-08: Phasing out fossil fuels and promoting locally based RE-heat by adjustment of requirements for district heating projects	Justering af projektbekendtgørelsen for at fremme fossiludfasning, sektorkobling og lokal VE-produktion.	Single	NA	Yes /	1: Energy supply	CO2, CH4, N2O	1_03: Switch to less carbon-intensive fuels, 1_06: Efficiency improvement in the energy and transformation sector	Not quantified objective	Regulatory	Related	2	Adopted	The "social economy requirement" of district heating projects is adjusted in order to promote district heating projects based on RE-technologies and locally produced heating.	2021	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
22	26		2-EN-09: Establishment of two energy islands	Etablering af to energiøer	Single	NA	Yes /	1: Energy supply	CO2, CH4, N2O	1_01: Increase in renewable energy sources in the electricity sector	Not quantified objective	Regulatory	Related	2	Adopted	A broad majority of the Danish Parliament agreed on 22 June 2020 to initiate the realization of two energy islands with a minimum capacity of 5 GW in 2030. The first of the energy islands will be located on Bornholm surrounded by a 2 GW offshore wind farm in the Baltic Sea. The other energy island is expected to be established as an artificial (or platform-based) island in the North Sea with a minimum capacity of 3 GW offshore wind and with the potential for expansion to 10 GW offshore wind at a later stage. On 29 August 2022, the parties behind the climate agreement decided to increase the capacity of the energy island on Bornholm to a minimum of 3 GW, with a connection of 2 GW to Germany and a 1.2 GW connection to Denmark. On 30 May 2023, the parties agreed on the framework for tendering 9 GW of offshore wind in Denmark, including the 3 GW of offshore wind around the energy island of Bornholm. 6 GW of offshore wind was tendered on 21 April 2024, while the tender of energy island Bornholm has not yet been determined. In addition, there is still no political agreement on the build-out of the energy island in the North Sea, including connections and capacities.	2021	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
23	27		2-EN-10: Stop oil and gas extraction in the North Sea in 2050 and cancellation of 8th and future tender rounds	Stop for indvinding af olie og gas i Nordsøen i 2050 og aflysning af 8. samt fremtidige udbudsrunder	Single	NA	Yes /	1: Energy supply	CO2, CH4, N2O	1_05: Reduction of losses	Not quantified objective	Regulatory	Non related		Adopted	The stop for oil and gas extraction in the North Sea in 2050 and cancellation of 8th and future tender rounds for new licences for exploration and production of oil and gas as well as reducing the area for oil and gas extraction to the western part of the North Sea implies a cessation of all activities in 2050.	2021	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

* Here "Yes" means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.5.1.9 Specific measures in the business sector (Fuel combustion in Manufacturing Industries and Construction, Commercial/Institutional and Agriculture, Forestry and Fisheries)

Energy use in the business sector covers energy use in Manufacturing Industries and Construction, Commercial/Institutional, Agriculture including Horticulture, Forestry and Fisheries (cf. the 2006 IPCC Guidelines for greenhouse gas inventories). In 2022, energy use in the business sector was responsible for 13.5% of Denmark's total greenhouse gas emissions (including LULUCF).

In 2022, the greenhouse gas emissions from energy use in the business sector decreased by approximately 41% from 9.6million tonnes CO_2 equivalents in 1990 to 5.6 million tonnes CO_2 equivalents in 2022. Energy efficiency improvements and energy savings are important reasons for the decrease.

According to the 2024 projection (CSO24), emissions from the business sector's energy use are expected to decrease to 3.4 million tonnes CO_2 equivalents in 2030. Here it should be noted that the global energy crisis resulted in an extraordinary low energy consumption in 2022 relative to previous years.

The on-going initiatives to reduce emissions from the business sector include promotion of energy savings and energy-efficiency improvements as well as conversion of energy production from fossil process energy to less CO_2 emitting fuels. Certain energy-intensive businesses are also subject to allowances regulation as a consequence of the EU Emission Trading Scheme (ETS).

Analyses have shown that there is a significant potential for profitable energy-efficiency improvements within the business sector, so improving energy efficiency is a vital area of action. These energy efficiency improvements in themselves, however, will have a limited impact on CO_2 emissions. In order to reach emissions reduction targets, initiatives aimed at fuel shift will be introduced.

The measures implemented in the business sector are shown in Table 4.17.

Industry is responsible for most of the sectors' emissions of CO_2. The emissions come mainly from energy-consuming activities in industry. Cement and brick production also contributes especially high levels of CO_2, due to the raw materials used.

The main instrument to reduce CO_2 emissions in energy-intensive industry is the EU's emission allowance scheme, covering about 80 industry installations.

Business and industry have introduced major energy efficiency improvements over the past 25 years. This is mainly due to a green tax package for the business sector, which was firstly introduced in 1995. The package contained a combination of taxes and discounts for energy intensive enterprises. The package led to a higher CO_2 tax and the introduction of a space-heating tax for businesses. In order to get the tax discount, the eligible energy intensive enterprises have to sign an agreement on energy efficiency with the Danish Energy Agency. With the political agreement on economic growth from 2013, the CO_2 tax on electricity in production process in the industry was abolished and the voluntary agreement scheme ended. Electricity production is thus included in the ETS. With a political agreement on economy growth from July 2014 it was decided to revive the voluntary agreement scheme to subsidize electro-intensive enterprises for their payment of electricity tax – the so called Public Service Obligation levy (PSO). The PSO scheme entered into force in September 2015, and was phased out in 2020 (cf. the phase-out of the PSO

mentioned in Chapter 4.3.4.1.4). In a political agreement from 2020 “Klimaaftalen for energi og industry mv.”, it was decided to incentivize usage of surplus heating from industrial processes for external purposes (e.g. district heating, industrial symbiosis). Thus, in 2021, a new voluntary scheme was introduced for businesses willing to make energy efficiency improvements in surplus heat used for external purposes. Businesses entering in to the scheme agrees to maintain ISO 50001:2018 with a focus on surplus heat and completing energy efficiency improvements related to surplus heat with a payback time less than five years. In return, the scheme subsidizes payment of the tax on externally used surplus heating. Currently, all surplus heating produced with other fuels than electricity is subject to taxation of 25 DKK/GJ (2018-priser). Participation in the scheme will lower the tax for externally delivered heat to 0 DKK/GJ.

Today businesses not included in the ETS are imposed the CO_2-tax on their fossil fuels for process and all businesses are imposed the CO_2-tax on their fossil fuels for space heating regardless whether the business is included in the ETS or not. Businesses pay an energy tax of DKK 8.1 per GJ on their fossil fuels used for process and an energy tax of DKK 68.8 per GJ on their fossil fuels for space heating (2024 tax rates). Some businesses, e.g. mineralogical and metallurgical processes, are exempt of the energy tax on their process and agriculture pay a lower rate than DKK 8.1 per GJ. VAT registered businesses in general pay a tax on electricity of DKK 0.004 per kWh. From 2021 the tax rate applies for their electricity for space heating as well. Before 2021 the rate on their electricity for space heating was higher. With the agreement on a green tax reform in 2022 (“Aftale om Grøn skattereform for industry mv” of 24 June 2022), it was agreed that energy taxes should be restructured to reflect CO_2-emissions. In 2023, the energy tax was raised by DKK 4 per GJ and will be fully phased in by 2025, by whichtime the reform will have increased the tax by DKK 6 per GJ.

Starting 2025 and fully phased in by 2030, a tax will be set directly targeting CO_2-emissions, which by 2030 will cost DKK 750 for non-ETS businesses and DKK 375 for ETS businesses, excepting businesses with mineralogical processes. The latter will pay a tax of DKK 125 per ton CO_2 emitted in 2030.

As an element in the implementation of the 2012 energy policy agreement, a DKK 3.75 billion (in EUR 500 million) fund was established to subsidise industries to convert to renewable energy. As of August 2013, businesses have been able to get investment subsidy from this fund to convert from fossil fuel (i.e. coal, oil, gas) to renewable energy sources (i.e. biomass, solar, wind) or district heating in their production process. The subsidy also includes investments in energy-efficiency measures. The estimated effect of this “Renewables for industry” initiative is a reduction of 1 million tonnes of CO_2 per year from 2020 and onwards. As a result of a political agreement of November 2016, the scheme expired at the end of the 2016.

Large enterprises in Denmark are by law required to have a mandatory energy audit every fourth year, cf. paragraph 15 in law no. 296 of 17 March 2023 “lov om fremme af effektiv energianvendelse og drivhusgasreduktion”. The law transposes the energy efficiency directive article 8. In implementing the former article 8, Denmark has defined “large enterprises” as enterprises that do not fall under the category of micro, small and medium-sized enterprises as defined in accordance with the Commission’s recommendation 2003/361/EC of 6 May 2003. The definition of enterprises subject to mandatory energy audits will be revised in accordance with the new version of the Energy Efficiency Directive, to target instead enterprises with a high yearly energy consumption between 10-85 TJ. Enterprises with ISO 50.001 or ISO 14.001 are

exempt. There is no requirement of implementing the energy saving proposals from the energy audits. Enterprises with yearly energy consumption over 85 TJ are subject to implement ISO 50.001 or ISO 14.001.

As part of a political agreement on economic growth from June 2014 a DKK 40 million (5.4 mio. EURO) fund was established to run a centre for energy savings in enterprises. The money was given for the period 2014-2017. The aim of the centre is to identify and exploit the energy efficiency potential already existing within primarily small and medium sized companies. The large companies are covered by the voluntary agrement scheme and the mandatory energy audit.

With a view to promote targeted energy savings, the energy efficiency obligation scheme expired by the end of 2020, and was replaced with a new subsidy scheme for energy efficiency improvements in businesses.

The 2018 Energy Agreement introduced a new scheme with subsidies for energy efficiency improvements in businesses from 2021-2024. The scheme was later prolonged with enhanced encouragements to make use of it. These funds will be limited to DKK 3.5 billion and there will be an individual subsidy cap. The scheme targets energy consumed in the delivery of services and manufacture of products – also known as "process energy". As per January 2023, the scheme now subsidizes investments that reduce CO_2 emissions as well as improve energy-efficiency.

Denmark's municipalities and regions own a total building mass of more than 36 million square metres. The energy efficient operation and renovation of these buildings holds great potential for reducing energy consumption. Therefore, the energy agreement allocates DKK 100 million annually in the period 2021-2024 for loans to finance energy renovations in buildings owned or operated by municipalities and regions.

The energy agreement allocates DKK 19 million in 2018, 33 million in 2019, 34 million in 2020, and 44 million annually from 2021-2024 for information activities relating to energy savings. This funding is also earmarked for the utilisation of data to promote energy efficiency.

TABLE 4.17 MEASURES IN THE BUSINESS SECTOR

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Parnld			- in national language									Related ?	No.						2020	2030		
27	31		3-BU-09: Mandatory Energy Audit for large Enterprises	Krav om energisyn af virksomheder med et højt energiforbrug	Single	NA	Yes /	2: Energy consumption, 4: Industrial processes	CO2, CH4, N2O	2_13: Efficiency improvement in industrial end-use sectors	Not quantified	Regulatory	Related	4;2	Implemented	Large enterprises in Denmark have by law for many years been required to have a mandatory energy audit every fourth year. The law is no. 345 of 8th of april 2014 "Lov om ændring af lov om fremme af besparelser i energiforbruget, lov om varmeforsyning, lov om kommunal fjernkølig og forskellige andre love". The law transposes the energy efficiency directive article 8. Denmark has defined large enterprise in accordance with the EU definitions saying that enterprises that do not fall under the category of micro, small and medium-sized enterprises, in accordance with the Commission's recommendation 2003/361/EC of 6 May 2003 concerning the definition of micro, small and medium-sized. Enterprises with ISO 50,001 or ISO 14,001 are exempt. The deadline for the first energy audits was the 5th of December 2015 and afterwards every fourth year. The scope of the energy audit are buildings, processes and transport. There is no requirement of implementing the energy saving proposals from the energy audits. With the Green Tax Reform agreed in June 2022, the requirement for energy audits was extended to include climate audits. From juli 2024 the scope of requiredе enterprises changes from large enterprises to enterprises with energy consumption >10TJ/yearly for energy audits and >85 TJ/yearly for ISO 50001 energy management system. In addition, all enterprises are required to do a climate audit with focus on CO2-emissions.	2014	2050	The Danish Energy Agency	NE	IE		Decarbonisation: GHG emissions and removals, Energy efficiency
28	33		3-BU-11: Denmark's Export and Investment Fund (EIFO)	Danmarks Eksport og Investeringsfond (EIFO)	Single	NA	Yes /	1: Energy supply, 2: Energy consumption, 3: Transport, 4: Industrial processes, 5: Waste management/ waste	CO2, CH4, N2O	1_01: Increase in renewable energy sources in the electricity sector, 1_02: Increase in renewable energy in the heating and cooling sector, 1_03: Switch to less carbon-intensive fuels, 2_10: Efficiency improvements of buildings, 2_13: Efficiency improvement in industrial end-use sectors, 3_18: Low carbon fuels, 3_19: Electric road transport, 4_27: Improved control of manufacturing, 5_31: Enhanced recycling	No quantified objective	Economic	Related	2	Implemented	In 2022, the Danish Green Investment has been merged with Vaekstfonden and EKF Denmark's Export Credit Agency into Denmark's Export and Investment Fund (EIFO). The new fond still provides loan capital to invest in various projects facilitating a sustainable development of society. The fund is able to grant loans to all types of privately-held companies and non-profit housing associations as well as public companies and institutions, whose budgets are seperate from the state, the regions and the municipalities. The activities of the fund will have a positive environmental effect due to e.g. environmental savings, increased production of renewable energy sources, more resource-efficient utility of water and materials or better waste recycling.	2022	2050	Ministry of Industry, Business and Financial Affairs	NA	IE		Decarbonisation: GHG emissions and removals
29	35		3-BU-13: Obligation for energy savings in government buildings	Krav om energibesparelser i statslige bygninger	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings	Reduction of energy consumption in government buildings by 42,480 MWh by 2030 compared to 2019 and reduction of energy consumption in Danish ministries by about 10 pct. by 2030 compared to 2020.	Regulatory	Related	2	Adopted	The circular require state institutions to: 1) Commit to two different energysavings targets (reduction of 42.480 MWh from 2021-2030 for buildings that are owned and used by the central government (e.i. EED art. 5) and 10 pct. reductions from 2021-2030 for the buildings that is not included in the EED art. 5 target, 2) Focus on energy efficiency in their behaviour 3) Buy energy efficient products 4) Operate state buildings in an energy efficient manner 5) Report the anual comsumption of energy and water to a public database, 6) Every ministry is required to develop an energy-effiencyplan on how they will reach to the target savings 7) Map all oilburners and gasfurnances in the buildings that are included in the circular.	2021	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Energy efficiency

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TABLE 4.17 MEASURES IN BUSINESS SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU			Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects																					
Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mld			- in national language									Related ?	No.						2020	2030		
30	36		3-BU-14: Competitive subsidy scheme related to private enterprises	Erhvervspuljen	Single	NA	Yes /	2: Energy consumption, 4: Industrial processes	CO2, CH4, N2O	2_13: Efficiency improvement in industrial end-use sectors, 4_27: Improved control of manufacturing	No quantified objective	Economic	Related	2	Adopted	The subsidy scheme targets energy efficiency initiatives and the switch from fossil to renewable energy use in industry. Thus, the initiative will speed up energy efficiency measures and transition to green energy in industry, and lead to a reduction in greenhouse gas emissions. In total, 3.3 billion DKK is allocated to the scheme in the period 2020-2029.	2021	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Energy efficiency
31	37		3-BU-15: Subsidy scheme for energy renovations in public buildings (municipalities and regions)	Tilskudspulje til energirenoveringer i offentlige bygninger	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings	No quantified objective	Economic	Related	2	Adopted	The Danish Government has established a subsidy scheme targeting energy renovations in public buildings of DKK 150 million annually in 2021 and DKK 145 million in 2022 (incl. administrative costs). The subsidy targeted energy renovations in regional and municipal buildings with the lowest energy labels as well as the buildings that are heated by oil burners and gas furnaces. It is currently estimated that the effort can reduce greenhouse gas emissions by [0.004] million tonnes CO2 eq. in 2025 and 2030.	2021	2022	The Danish Energy Agency	NA	IE	The scheme was open for applicants in 2021 and 2022.	Decarbonisation: GHG emissions and removals, Energy efficiency
			3-BU-21: Subsidy scheme related to CO2-intensive enterprises. The scheme will partly subsidize the investment cost in projects that will lead to a decrease in CO2 emissions		Single	NA	No /	2: Energy consumption, 4: Industrial processes	CO2, CH4, N2O	2_13: Efficiency improvement in industrial end-use sectors, 4_27: Improved control of manufacturing	No quantified objective	Economic	Related	2	Adopted	The subsidy scheme targets decarbonization in industry. Thus, the initiative will lead to a reduction in greenhouse gas emissions. In total 900 million DKK is allocated to the scheme in the period 2025-2029.	2025	2029	The Danish Energy Agency	NA	IE		Decarbonisation: GHG emissions and removals
			3-BU-22: Competitive subsidy scheme related to CO2-intensive enterprises. The scheme will subsidize entreprises experiencing increased operating costs due to decarbonization		Single	NA	No /	2: Energy consumption, 4: Industrial processes	CO2, CH4, N2O	2_13: Efficiency improvement in industrial end-use sectors, 4_27: Improved control of manufacturing	No quantified objective	Economic	Related	2	Adopted	The scheme will subsidize entreprises experiencing increased operating costs due to decarbonization. Thus, the initiative will lead to a reduction in greenhouse gas emissions. In total 1 billion DKK is allocated to the scheme in the period 2025-2034.	2025	2034	The Danish Energy Agency	NA	IE		Decarbonisation: GHG emissions and removals
88	114		3-BU-16: Targeted support for horticulture	114: Målrettet støtte til gartnerier [KEFM PAM E]	Single	NA	No /	2: Energy consumption	CO2	2_14: Demand management/reduction	No quantified objective	Economic	Related	2	Adopted	The horticulture/green houses have good opportunities to transition away from fossil fuels, for example by converting to electric heat pumps, biomass, or district heating. However, their general competitive situation makes it difficult to bear the full economic cost of switching to renewable energy and a high CO2 tax is expected to result in reduced production, rather than transition to renewable energy. Therefore, there will be allocated funds to support the transition of the horticulture/greenhouses in 2025-2029.	2023	2023	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Energy efficiency

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TABLE 4.17 MEASURES IN BUSINESS SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU		Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects																				
Interne oplysninger til EU rapporterings-formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Parnld			- in national language									Related ?	No.						2020	2030		
90	119		3-BU-17: Energy efficiency efforts	119: Energieffektiviseringsindsats (KEFM PAM O)	Single	NA	No /	2: Energy consumption	CO2	2_10: Efficiency improvements of buildings, 2_11: Efficiency improvement of appliances, 1_06: Efficiency improvement in the energy and transformation sector	No quantified objective	Economic	Related	2	Adopted	The Danish Government has several energy efficiency efforts: - Buildings need an energy label after construction and on sale/rental. The label uses data and digital validation to improve accuracy. A new report layout was created in 2021 to improve user-friendliness, relevance, and actionable recommendations. - Denmark requires energy labels and plans for public buildings over 250m² every 10 years, and display them in a prominent place. A new regulation from 2021 aims to reduce energy consumption in central governmental buildings through renovations and behavioral measures. - Denmark has a national energy-labelling scheme for windows. The government offers a subsidy scheme for energy efficiency measures such as insulation, ventilation, and heat pumps. - DEA promotes energy-efficient behavior and solutions for households, businesses, and the public sector. They provide free advice, webinars, and local meetings to promote energy efficiency and the use of renewable energy sources. - Provides information and tools to craftsmen and educational institutions to promote energy efficiency. They also offer courses for craftsmen and collaborate with labor market training centers. →In 2020, a subsidy scheme was introduced for the company providing the subscription. - "Better Houses" promote energy renovation of buildings by providing a "one stop shop" service for homeowners, where they can contact one certified building contractor for overall counseling. Skilled craftsmen are educated to be advisors on energy renovation. - Denmark notified a long-term renovation strategy (LTRS) to support building stock renovation, including non-binding milestones for 2030, 2040 and 2050. The strategy outlines initiatives to promote energy efficiency in buildings.	2022	2023	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Energy efficiency
93	130		3-BU-19: Green reinsurance facility in EKF - now Denmark´s Export and Investment Fund	130: Grøn genforsikrings facilitet i EKF - nu Danmarks Eksport- og Investeringsfond (ny) [EM PAM A]	Single	NA	No /	8: Other sectors	CO2	8_57: Member States shall provide a brief description of the objective.	No quantified objective	Economic	Related	2	Adopted	Green reinsurance facility in EKF - now Denmark´s Export and Investment Fund (new).	2023	2023	Ministry of Industry, Business and Financial Affairs	NA	IE		Decarbonisation: GHG emissions and removals
94	131		3-BU-20: Green capital injection in Vaekstfonden - now Denmark´s Export and Investment Fund	131: Grøn kapitalindsprøjtning i Vækstfonden - nu Danmarks Eksport- og Investeringsfond (ny) [EM PAM B]	Single	NA	No /	8: Other sectors	CO2	8_57: Member States shall provide a brief description of the objective.	No quantified objective	Economic	Related	2	Adopted	Green capital injection in Vaekstfonden - now Denmark´s Export and Investment Fund (new).	2023	2023	Ministry of Industry, Business and Financial Affairs	NA	IE		Decarbonisation: GHG emissions and removals

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* Here “Yes” means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.5.1.10 Specific measures in the transport sector

In 2022, the transport sector was responsible for 28.9% of Denmark's total greenhouse gas emissions. The emissions from the transport sector are primarily CO_2 with a share of 98.9% of the transport sector's total greenhouse gas emissions. Nitrous oxide makes up approximately 1.0% and methane about 0.1%.

The transport sector's greenhouse gas emissions peaked in 2007. The baseline scenario from 2024 (CSO24) predicts the sectors overall greenhouse gas emissions to decrease by 44% from 2007 to 2030.

In 2022, the road transport was accountable for 93.6% of the sectors national emissions.

Table 4.18 shows the existing policies and measures within the transport sector.

The speed of the transition to electrified vehicles has increased over recent years due to the technical improvements of the EV-cars, the reduction in purchase price as well as political action. The national measures for the transport sector aims at creating the right incentives structures as well as planning for and funding charging infrastructure on the state road network and make available the regulatory framework for a proper charging infrastructure overall.

The registration tax and the annual tax (the green owner tax), which is dependent on the energy efficiency of the vehicle as well as fuel taxes, are assessed to have had considerable effects on CO_2 emissions. With *Aftale om grøn omstilling af vejtransporten* (Agreement on green transition of the road transport) it was among other things decided to rearrange the registration tax, so it further promotes the uptake of low and zero emission cars. Further information on taxes is included in chapter 4.3.3.

Regarding charging infrastructure, EUR 43 million have been set aside from 2020-2022 to co-fund charging infrastructure projects at housing associations as well as on private and municipal areas. Furthermore, with Infrastrukturplan 2035 (Infrastructureplan 2035), there was allocated EUR 67 million in the period 2022-2030 to the roll out of charging infrastructure along state roads.

By April 2024, the European Parliament and the European Council adopted a regulation on the deployment of infrastructure for alternative fuels (AFIR). In relation to this an amendment to the Danish law on alternative fuels infrastructure for transport was adopted and entered into force on 13 April 2024. The law has been adjusted in accordance with AFIR.

As a part of Infrastrukturplan 2035 (Infrastructureplan 2035), it was decided to set aside EUR 37 million for alternative fuels infrastructure for heavy duty vehicles. More funding has been prioritized, so that in total approximately EUR 100 million have been allocated to the deployment of 25 recharging stations along the TEN-T road network in Denmark. A plan for the roll out of the 25 stations have been adopted which ensures that Denmark will live up to the obligations regarding recharging stations aimed at heavy-duty vehicles in the AFIR.

A kilometre based and CO_2-differentiated toll for heavy-duty vehicles is to be launch from January 2025. To begin with, the new toll applies to sections of the road network which covers 10.900 km. From 2028 onwards, the toll will be extended to all public roads in Denmark. The average toll in 2030 will be EUR 0.17 per kilometre, while zero emission vehicles will get a substantial lower rate. The political decision on the toll in Aftale om kilometerbaseret vejafgift for lastbiler (Agreement

on kilometre based toll for heavy-duty vehicles), is combined with a reform of the weight and dimension regulation for heavy duty vehicles.

To reduce the use of diesel the exercise tax on diesel will be increase by DKK 0,5 per litre. In order to compensate car owners, the half-yearly tax on owning a diesel car (Udligningsafgiften) will be reduced. Heavy-duty trucks are compensated in the short run by a reduction of 19 and 12 percent in the road toll in 2025-2027 and 2028, respectively. Additionally, a fund of DKK 750 million has been adopted which can support investment in zero emission vehicles and political initiatives that increase the allowed weight and dimension of heavy-duty vehicles. The fund will be allocated in the period 2024-2030.

When it comes to rail projects, the political parties behind *Infrastrukturplan 2035* agreed that train traffic in Denmark should be CO_2-neutral. The political parties allocated EUR 154.1 million (DKK 1149.9 million in 2024 prices) for the purchase of four battery electric trains and charging infrastructure for the trains. Furthermore, EUR 40.0 million (DKK 1149.9 million in 2024 prices) were set aside for grants to support charging infrastructure along private railways.

Going forward, initiatives will be prioritized in those subsectors that are more challenging to decarbonise such as aviation, shipping and heavy-duty road transport. For the aviation and shipping sectors, it is expected that especially renewable fuels such as renewable fuels of non-biological origin will contribute to the reduction of greenhouse gas emissions.

TABLE 4.18 MEASURES IN THE TRANSPORT SECTOR

Orange kolonner = Ekstra til EU		Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects																			
Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.						2020	2030		
32	38	Table 4.18	4-TR-01a: EU demands on vehicle manufactures to deliver fuel efficient cars and vans	EU's krav til køretøjsproducenter om at levere brændstofeffektive biler og varevogne	Single	NA	Yes /	3: Transport	CO2	3_16: Efficiency improvements of vehicles	No quantified objective	Regulatory	Related	19	Implemented	The EU's requirements on average CO2 emissions for passenger cars and vans, i.e. the mechanism imposing fines on manufacturers if they fail to comply with the CO2 targets.	2000	2050	The European Commission	NE	IE		Decarbonisation: GHG emissions and removals, Energy Efficiency
33	39		4-TR-07: Spatial planning	Fysisk planlægning	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels, 3_19: Electric road transport, 3_20: Demand management/reduction , 3_22: Improved transport infrastructure	No quantified objective	Regulatory	Related	4;2	Implemented	Spatial planning on state, regional and local level is also taking into account the objective to limit the growth in demand for passenger and freight transport and thereby reduce the number of vehicle kilometres driven and GHGs emitted. For example, spatial planning, in terms of urbanization and increased focus on minimising distances between residential areas/city centres and stations, help to reduce the need for transport.	2000	2050	Municipalities	NE	IE		Decarbonisation: GHG emissions and removals
34	41		4-TR-10: Electrification of parts of the rail infrastructure	Elektrificeringsprogrammet	Single	NA	Yes /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	4;2	Adopted	The entire danish railnetwork will be electrified with catenary lines or battery trains. BANEDANMARK is still in the process of electrifying. The last track to be electrified with catenary lines will be ready for commissioning by the end of 2028 – i.e. full implementation by 2029. The exact rollout of battery trains awaits an analysis.	2013	2029	Ministry of Transport	NE	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
35	42		4-TR-12: Investment in a tunnel under the Fehmarn Belt	Investering i en tunnel under Femarn Bælt	Single	NA	Yes /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	4;2	Adopted	The tunnel under the Fehmarn Belt will reduce CO2-emissions by potentially 200.000 tonnes per year. This is mainly because of the following effects: 1.Goods will shift from road to rail. 2. The travel distance from Copenhagen to Hamburg will be shortened. 3.The ferries between Rødby and Puttgarden is expected to cease operation. 4. The railway between Ringsted and Lübeck is electrified.	2029	2050	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
36	43		4-TR-13: Use of climate-friendly asphalt for all wear layer replacements on the state road network.	Anvendelse af klimavenlig asfalt ved udskiftninger af slidlag på statsvejnettet frem mod 2035.	Single	NA	Yes /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Regulatory	Related	2	Implemented	Use of climate-friendly asphalt for all wear layer replacements on the state road network. The climate-friendly asphalt reduces the resistance between the tire and the road which leads to a reduction in fuel consumtion leading to a reduction in CO2-emissions.	2020	2024	Ministry of Transport	NE	IE		Decarbonisation: GHG emissions and removals
37	46		4-TR-16: Allocated funds of DKK 250 million for green buses and green vehicles for demand responsive transport.	Pulje til grønne busser og grøn flextrafik	Single	NA	Yes /	3: Transport	CO2	3_19: Electric road transport	No quantified objective	Economic	Related	2	Implemented	DKK 250 million is allocated for green buses and demand responsive transport in the annual budget from 2022-2026. Each year DKK 50 million will be given to the aplicants of the funds. The parties have agreed on the annual budget decided to allocate the first DKK 50 million to busses on regional routes.	2022	2026	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy

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TABLE 4.18 MEASURES IN TRANSPORT SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU		Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects																				
Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implementation	Brief description	Start year of implementation	End year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Parmid			- in national language									Related ?	No.						2020	2030		
38	47		4-TR-17: Requirements to promote green taxis (Energy and environmental requirements for taxis)	Krav for at fremme grønne taxier	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels, 3_19: Electric road transport	No quantified objective	Regulatory	Related	2	Implemented	Of 1st January 2021 the energy and environmental requirements for taxies are tightened and new taxies (passenger car size) have to meet A++ requirements to be able to be a part of the industry.	2020	2050	Ministry of Transport	NE	IE		Decarbonisation: GHG emissions and removals
39	49		4-TR-19: Implementation of pool for green transport in 2020 (DKK 75 million)	Udmøntning af pulje til grøn transport i 2020 (75 mio. kr.)	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels, 3_19: Electric road transport	No quantified objective	Regulatory	Related	2	Implemented	DKK 75 million was allocated in 2020 to extension of charging infrastructure and green transition of commercial transport.	2020	2021	Ministry of Transport	NE	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
40	50		4-TR-20: Minimum implementation of the Fuel Quality Directive (FQD)	Minimumsimplementering af brændstofkvalitetsdirektivet (FQD)	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels	No quantified objective	Regulatory	Related	2	Implemented	Minimum implementation of the Fuel Quality Directive (FQD), i.e. a reduction of the greenhouse gas intensity of transport fuels by a minimum of 6% by 2020 and after 2020 compared to 2010 levels	2020	2050	The Danish Ministry of Climate, Energy and Utilities	NE	IE		Decarbonisation: GHG emissions and removals
41	51		4-TR-21: Advancing and increasing the existing pool for green transport	Fremrykning og forøgelse af den eksisterende pulje til grøn transport	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels, 3_19: Electric road transport	No quantified objective	Economic	Related	2	Adopted	An existing subsidy scheme for green transition of transport was increased with DKK 50 million to a total of DKK 475 million which was advanced to 2021. The funds were allocated to the transition of ferries, extension of charging infrastructure and transition of commercial transport.	2021	2022	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation:
42	52		4-TR-22: CO2 displacement requirements for RE fuels	CO2-fortrængningskrav for VE-brændstoffer	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels	No quantified objective	Regulatory	Related	2	Implemented	"CO2 displacement" in relation to transport means well-to-wheel greenhouse gas reduction. A part of a political agreement from 2020 regarding the transport sector is to replace the current blending mandate with an obligation to reduce GHG intensity of fuels on a well-to-wheel basis. The new scheme is based on a technological neutral regulation, which promotes the use of RE-fuels with low GHG-intensity including new fuels such as Power-to-X based fuels. The obligation to reduce the GHG intensity of fuels is phased in from 3,4 % in 2022-2024 increasing to 5,2 % in 2025, 6 % in 2028 and 7 % in 2030. The target is estimated to reduce the CO2-emission by 0,7 mio. ton in 2025 and 1,4 mio. ton by 2030.	2022	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
43	53		4-TR-23: Allocated funds for green transport 2021-2022 – The ferry subsidy scheme to support the green conversion of domestic ferries 2021-2022	Pulje til grøn transport – Færgepulje til grøn omstilling af indenrigs-færger, hvortil der 2021-2022 kunne søges om tilskud til anskaffelse eller leasing af nye grønne færger eller til retrofit af eksisterende færger. Tilskuddet inkluderede også eventuelle investeringer i nødvendige havnetilpasninger.	Single	NA	Yes /	3: Transport	CO2	3_18: Low carbon fuels, 3_19: Electric road transport, 3_22: Improved transport infrastructure	No quantified objective	Regulatory, Economic	Related	2	Adopted	A subsidy scheme of total DKK 285 million in 2021-2022 for green transition of ferries was agreed upon in two political agreement in the spring/summer of 2021. The fund was allocated to the transition of ferries. Grants could be applied for the acquisition or leasing of new green ferries or for the retrofit of existing ferries. The grant also included any investments in necessary port adaptations.	2021	2023	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy

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TABLE 4.18 MEASURES IN TRANSPORT SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implementation	Brief description	Start year of implementation	End year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.						2020	2030		
44	55		4-TR-25: Climate-friendly cooperation agreements on green public transport	Klimasamarbejdsaftaler om grøn kollektiv trafik	Single	NA	Yes /	3: Transport	CO2	3_19: Electric road transport	Not quantified objective	Economic	Related	2	Adopted	Since June 2020 the Minister for Transport has agreed with municipalities and regions on "Climate-cooperation agreements on green public transport". With the agreement municipalities and regions are obliged to buy CO2-neutral or zero-emission busses whenever their old (diesel)busses needs to be replaced.	2021	2050	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
108	149		4-TR-26: Government subsidy for the purchase of four battery trains for battery trains in Holstebro and Skjern	149: Statens tilskud til indkøb af fire batteritog til Holstebro og Skjern jf. aftale om IP35 [TRM PAM A]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	DKK 230 mio. (2021-prices) was allocated for the purchase of four battery trains. The line between Holstebro and Skjern will be the first line with battery train operation in Denmark from 2025. The investment provides the opportunity to gain the necessry experience with battery train operation prior to the roll-out of battery train on other lines.	2023 (purchase) and 2025 (effect)	-	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
109	150		4-TR-27: Funds have been set aside for a green mobility model, where the traffic models that form the basis of decisions in the transport area are further developed, cf. agreement on IP35	150: Der er afsat midler til en grøn mobilitetsmodel, hvor der videreudvikles på trafikmodellerne, der ligger til grund for beslutninger på transportområdet jf. aftale om IP35 [TRM PAM B]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	DKK 6 million annually from 2022 to 2035 allocated for a green mobility model. The funding will support a further developement of traffic models that form the basis of decisions in the transport area.	2022	2035	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
110	151		4-TR-28: Funds to improve cycling facilities along the state road network, cf. agreement on IP35	151: Puljer hhv til cyklisme og ladeinfrastruktur langs statsvejnettet jf. aftale om IP35 [TRM PAM C]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	DKK 3 billion for construction and improvement of bike lanes, as well as development and analysis for advancing and promoting cycling infrastructure.	2022	2035	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
111	152		4-TR-29: Plan and funds (approximately 100 mio. euro) for the establishment of 25 recharging stations for heavy vehicles, cf. agreement on IP35	152: Udrulning af ladeparker til tung transport til opfyldelse af krav i AFI-forordningen. Der er samlet afsat over 750 mio. kr. [TRM PAM D]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	A total allocation of DKK 763 million (2024-prices) towards the deployment of 25 recharging stations along the TEN-T road network in Denmark. A plan for the roll out of the 25 stations have been adopted which ensures that Denmark will live up to the AFI-regulation with regards to recharging stations aimed at heavy duty vehicles.	2022	2030	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
112	153		4-TR-30: Funds for advisory center for bicycle promotion.	153: Midler til rådgivningscenter for cykelfremme. Centeret skal yde rådgivning til virksomheder om tiltag, de kan iværksætte for at skubbe på medarbejdernes transportvalg til fordel for cyklen samt rådgivning om, hvordan elladcykler kan dække en del af behovet for virksomhedernes varetransport og anden kommerciel distribution. [TRM PAM E]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure, 3_17: Modal shift to public transport or non-motorized transport	No quantified objective	Economic	Related	2	Adopted	DKK 4 million for advisory center for bicycle promotion. The advisory center will provide companies with advice on how to promote cycling, as well as provide advice in which ways electric bikes can partly cover the transport of goods.	2022	2025	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
113	154		4-TR-31: Funds for the promotion of infrastructure for cycling, cf. agreement on Green transformation of road transport 2020.	154: Midler afsat til fremme af infrastruktur til cyklisme, jf aftale om Grøn omstilling af vejtransport 2020. Finansieringen hertil kommer fra det danske hjemtag fra EU's genopretningsfacilitet. [TRM PAM F]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure, 3_17: Modal shift to public transport or non-motorized transport	No quantified objective	Economic	Related	2	Adopted	DKK 10 million in 2024 for publicly accessible charging facilities for electric bikes. The initiative is financed by the Danish takeover of the EU's recovery facility.	2024	2024	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
114	155		4-TR-32: Subsidy for charging infrastructure for battery trains on the private railway lines.	155: Tilskud til ladeinfrastruktur til batteritog på privatbanerne. [TRM PAM G]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	A subsidy scheme of total DKK 275 million in 2025-2035 for charging infrastructure for battery trains on private railway lines was agreed on in September 2022. A region can get up to 65 per cent of the establishing cost covered per railway line.	2025	2035	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
115	156		4-TR-33: Funds for the devlopment of charging infrastructure for light duty vehicles, Infrastructure Plan 2035	156: Pulje til ladeinfrastruktur, Infrastrukturplan 2035 [TRM PAM H]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	Investments of DKK 500 million in charging infrastructure along the state road network in the periode 2022-2030. The funds will secure a high level of service for charging on longer car trips along the national road network.	2022	2030	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
116	157		4-TR-34: Port subsidy scheme to support establishment of e.g. wharves, piers, road infrastructure at the port and on shore power supply, cf. agreement on Infrastructure Plan 2035 (IP35)	157: Havnepulje hvortil der kunne søges om tilskud til f.eks. etablering af kajanlæg, moler, vejinfrastruktur på havnen og eventuel infrastruktur til landstrøm jf. aftale om Infrastrukturplan 2035 (IP35). [TRM PAM I]	Single	NA	No /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	50 mio. DKK allocated to a port subsidy scheme to support the establishment of e.g. wharves, piers, road infrastructure at the port and on shore power supply	2022	2023	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
117	158		4-TR-35: Port and Fishing subsidy scheme to promote a green transition of ports and transition efforts within fishing and related ancillary industries.	158: Havne- og Fiskeripulje til at fremme en grøn omstilling af havne og omstillingsindsatser inden for fiskeri og relaterede følgeerhverv. [TRM PAM J]	Single	NA	Yes /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	25 mio. DKK allocated for a port and fishery subsidy scheme to help support a green transition of ports and transition efforts in the fishing industry and related secondary industries	2021	2021	Ministry of Transport	NA	IE		Decarbonisation: GHG emissions and removals
126	167		4-TR-36: CO2-neutral charging infrastructure on the state railways	CO2-neutralt ladeinfrastruktur på statsbanerne	Single	NA	Yes /	3: Transport	CO2	3_22: Improved transport infrastructure	No quantified objective	Economic	Related	2	Adopted	DKK 750 mio. (2021-prices) was allocated for the establishment of the necessary charging infrastucture for battery train operation on the state railway lines that are not planned to be fully electrified. The charging infrastructure on the first line is expected to be ready for battery train operation around 2025.	2021 (funds) and around 2030 (effects)	-	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

* Here “Yes” means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.5.1.11 Specific measures in the residential sector

In 2022, the residential/household sector contributed to Denmark's total national greenhouse gas emissions with 1.2 million tonnes of CO_2 equivalents, corresponding to a share of 2.8%. The residential sector in the greenhouse gas inventory only includes CO_2 emissions from burning of oil and natural gas since emissions from production of electricity and district heating used by households are attributed to the plants where the electricity and heat is produced.

In this section, measures addressing all types of energy consumption in the household sector are described, although some of the energy savings will result in emission reductions in the energy production sector.

In 2022, consumption of energy by households, including electricity and district heating, was responsible for around 29% of the total final energy consumption in Denmark.

The major part of energy consumption in households is used for space heating - 83% in 2022. District heating constituted 48% of household energy consumption for heating in 2021. When district heating is produced at CHP plants or with renewable energy, there are big CO_2 savings overall from the use of district heating instead of individual heating based on, for example, oil-fired boilers.

Oil consumption for heating is 4% of household energy consumption in 2021. According to Climate Status and Outlook 2024, oil is expected to amount to 1% of final energy consumption for heating in 2030, as it was assumed in Climate Projection 2024, that recent decades' phase-out of oil consumption for heating continues.

In Climate Status and Outlook 2024 (CSO24), it is estimated that the greenhouse gas emissions in the electricity and heating sector in Denmark in 2030 will be very limited, as a result of the expansion of renewable energy and the overall green transformation of Denmark's energy system. From 2029, the production of green gas is estimated to exceed the total Danish consumption of piped gas, whereby according to projections there will be no emissions associated with gas consumption from 2029. Consequently CO_2 reductions are limited by reducing either electricity or district heating - or gas consumption after 2030.

Up to 2004, households changed to gas in particular, but from 2004 onwards the change is more to wood pellets in particular. Up to 2030, the consumption of oil, gas and wood pellets is expected to fall. The falling consumption of wood pellets and fossil fuels will be offset by an increasing contribution from heat pumps and district heating.

Households' disposal of waste also contributes to emissions of methane from landfill sites.

The action being taken on households' waste and transport consumption is described in the sections on waste and transport. This section therefore concentrates on the possibilities of reducing the CO_2 emissions through savings in electricity and heating in households and the possibilities for conversion to more environment-friendly forms of heating. The possibilities for reduction in the public energy supply system are described in the section on the energy sector.

In 2022, the final energy consumption in the household sector was 140 PJ for space heating and hot water (climate-corrected) and 27.7 PJ of electricity for appliances,

etc. Please note that the global energy crisis resulted in an extraordinay low energy consumption in 2022 relative to previous years. Except for in 2022 consumption for heating has fluctuated around a certain constant level for 10 years, in spite of an increase in the number of households and in the area heated.

Despite a rising number of electrical appliances, the associated electricity consumption has remained at a quite constant level over the past 15 years. This is because electrical appliances have become more efficient, partly because of the EU Ecodesign Directive and the Energy Labelling Directive.

Several political agreements include initiatives ensure that renewable energy output in Denmark matches the country's total electricity consumption by 2030 among others *Sub-agreement on Investments in a continuously greener Denmark* and *Supplementary agreement on energy island Bornholm 2022.*

With a view to reducing energy consumption and environmental impacts from the household sector, a wide range of initiatives have been launched, as described in Table 4.19 in order to promote:

- Electricity savings,
- Savings in energy consumption in space heating, and
- Fuel conversion (from the use of oil and gas to district heating and the use of renewable energy).

Several concrete measures and incentives already implemented are described below.

Energy taxes
All energy consumption for space heating as well as other energy consumption in households and the public sector, as well as non-VAT-registered businesses is subject to energy taxes. Throughout the 1990s CO_2 and energy taxes have steadily increased, but since 2002 they have been almost stable. The CO_2 tax was increased in 2010 by more than 50 pct. The increases have mainly affected households, helping to reduce their energy consumption.

As expanding infrastructure powered by renewable energy will be a key component in Denmark's successful green transition, the 2018 Energy Agreement included initiatives with a view to reducing taxes on electricity and restructure the rules on surplus heat utilisation. The rules for surplus heat has been simplified. As surplus heat often is boosted with electric heat pumps, the reduced rates on electricity has lowered the taxes on utilisation of surplus heat considerably. Further reductions of tax on electrical heating have been adopted with the 2020 Climate Agreement for energy and industry as well as increases of energy tax on fossil fuels for space heating. To implement incitements to change to green energy and to meet the high energy prices several agreements reducing the electricity tax on other electricity than electrical heating was implemented in 2022.

Increased electrification is essential to harnessing the full potential of green energy, and will enable the integration of fluctuating outputs of wind and solar energy into our energy system. Green electricity can be converted into heat and channelled through district heating systems or into large-scale heat storage facilities – ensuring a flexible energy system and optimum utilisation of green electricity.

Electrification of the energy system is thereby a cornerstone of the green transition.

Despite a steadily growing supply of green electricity, the taxes on electricity for households in Denmark remain very high. High taxes on electricity constrain the use

of electricity by Danes, causing significant socioeconomic losses. To address this problem, tax on electrical heating was reduced from 0.155 DKK/kWh to 0.004 DKK/kWh for industries and to 0.008 DKK/kWh for households in 2021 in accordance with the EU minimum tax rates as part of the 2020 Climate Agreement. Furthermore several agreements reducing the electricity tax on other electricity than electrical heating was implemented in 2022. In response to the elevated energy prices in 2022 and 2023, the tax on other electricity were reduced to the minimum level mandated by the European Union for the initial six months of 2023. Subsequent to the period, the taxes were reinstated reamning persistently below those of prior years. The electricity tax is further described in section 4.3.3.

The lower taxrates are expected to increase electricity consumption. However, the renewable energy output in Denmark is expected to match the country's total electricity consumption by 2030. Electrical heat pumps are furthermore expected to replace heating based on fossil fuels and biomass. A working group will be tasked with exploring electricity tariffs and related issues, including the conditions for certain groups of electricity customers and whether tariffs can be billed in a different and better way. The possibility of a dynamic electricity tax will also be explored. The tax reductions will equate to lower electricity bills, thus improving the productivity of businesses and the welfare of individual households.

CO_2 taxes

Some of the energy consumption in households is subject to CO_2 taxes. The CO_2 tax is further described in section 4.3.3.

Minimum energy requirements for buildings

Denmark has a long experience with energy efficiency and energy savings in buildings. From 1990 to 2021 final energy consumption for space heating has been reduced by 24.5% per m^2.

All new buildings must, according to the Danish building code, be constructed as nearly zero-energy buildings (NZEB). Strict and progressively tightened building regulations since 1977 have ensured a stable demand for energy-efficient building technologies.

Most new buildings shall, according to the Danish Building Code, declare the total CO_2-eq emission from the lifecycle of the building, according to EN 15978. The obligatory modules are A1-A3, B4, B6, C3, C4 and D. Buildings larger than 1000 m^2 shall in addition to this also live up to a limit value of 12 kg CO_2-eq/m^2 per year using the same modules, except for D.

Energy labelling of buildings when built, sold or rented

Energy labelling of buildings must be implemented after finishing the construction of a building and on the sale or rental of the building.

The purpose of the energy labeling scheme for buildings is to promote energy savings by making the need for energy and the possibilities for energy renovation of buildings visible. Energy renovation reduces i.a. energy costs and can at the same time provide a better indoor climate in the buildings. The energy label is based on a physical review of the building, where a certified energy labeling company collects information about the building. As part of the Climate Agreement for energy and industry from 2020, emphasis is placed on the use of data to improve the quality of the energy label. The energy labeling scheme thus uses automatic digital validations in the electronic calculation programs so that the energy labeling company's registrations are already assessed before the energy label is issued to the building

owner. The validations are developed on the basis of experience from previous energy labeling reports, which were found using Denmark's energy labeling database.

In 2023, approximately 75,000 energy labeling reports have been prepared and they cover approximately 106,000 buildings. In total, approximately 182,000 profitable energy saving proposals have been indicated in the reported energy labels. To support the energy labels and the savings proposals, a new report layout for the energy labeling reports has been prepared in 2021. The new energy labeling reports have been developed in collaboration with behavioral scientists with a focus on building owners being encouraged to a greater extent to carry out energy renovation of their buildings.

Regular energy labelling of public buildings and display of EPC

The Energy Performing Certificate (EPC) consist of an energy label and an energy plan. For publicly owned buildings over 250 m^2 the EPC must be prepared regularly every ten years. Furthermore all large buildings over 600 m^2 which are frequently visited by the public must display the EPC in a prominent place clearly visible to the public.

Denmark has implemented a new administrative regulation from January 1 2021, which entails requirements for further reducing energy consumption in the period 2021-2030 in central governmental buildings. Energy savings will among others be obtained through energy renovations and behavioral measures.

Minimum energy requirements and energy labelling of appliances

The Danish Energy Agency has a national energy-labelling scheme for façade windows. A large majority of suppliers adhere to the scheme.

Danish authorities play an active role both in negotiation of compulsory EC requirements and in securing awareness of and compliance with these, including through information on the agency’s website. In general, the effect of EC product regulation is accounted for elsewhere.

Subsidy scheme related to buildings

The Subsidy scheme related to residential buildings is an application-based subsidy scheme, wherein private citizens can apply for grants subsidizing the installation of an electric heat pump when converting from gas-, oil- or pellet boilers or electrical heating. The scheme furthermore offers grants for general energy efficiency measures such as insulation, ventilation and energy efficient windows. Subsidies can be allocated to owners of buildings who have renovated their buildings in accordance with a specific list of energy savings belonging to the subsidy scheme.

The first application round for the scheme was held in 2020, with full disbursement of funds each year since. From 2023, the scheme was divided into two separate schemes, focusing on heat pumps and energy efficiency measures respectively. A total of 2.6 billion DKK has been allotted the scheme, including the two new separate schemes, during the years 2020-2026.

Information initiative towards private households

The Danish Energy Agency carries out efforts to promote energy-efficient behavior and energy-efficient solutions. The information efforts focus on both private households, business and the public sector.

Energy efficiency of buildings and support for energy efficient behavior in buildings is a central priority in the Danish information effort. The efforts includes the

preparation of material on energy-efficient solutions, information on building regulations and easy access to information and knowledge on energy renovation. The Danish Energy Agency's website www.SparEnergi.dk and associated social media are the backbone of the agency's communication about energy-efficient solutions both in private households and in public and private companies.

Since 2016, private households have been able to get free, unbiased advice on energy consumption and energy-efficient solutions via phone and email. In addition, the Energy Agency offers both webinars and local inspiration meetings to promote knowledge of energy-efficient solutions, energy renovation and conversion away from fossil fuels in individual heating. The events are organized in collaboration with the local municipality. In 2022, 255 meetings were held. 60 % were local meetings 40% were held as webinars. The events contribute to increased energy efficiency and conversion away from oil and gas boilers to heat pumps and district heating.

Knowledge Centre for Energy Savings in Buildings
The Knowledge Centre for Energy Savings in Buildings is a service for craftsmen and educational institutions concerning energy efficiency improvements. The centre supplies the building professionals, schools and universities with knowledge, guides and online tools, promoting energy savings and good practice. They also provide courses to support the further education of craftsmen within the field.

The 2018 Energy Agreement focuses on the remaining oil-fired boilers and barriers to promote the use of heat pumps. Subsidies for scrapping of gas- and pellet-based broilers were also added through later expansions of the scheme. In 2020 a subsidy scheme was introduced, where the energy service provider assumed ownership of the heat pump and responsibility for installation, operation and maintenance of the heat pump. The customer (owner of the building) typically paid a one-off payment, a subscription fee and a price for the delivered heat to the building. With heat pumps on subscription, the consumer avoided a large investment and at the same time obtained a number of service benefits. It is the company providing the heat pumps on subscription that was eligble for the subsidy.

"Better Houses"
"BetterHouses" is a scheme (voluntary and market-driven system) focusing on energy renovation of buildings. The aim is to make it easier for owners of buildings, mostly homeowners, to energy renovate by creating a "one stop shop" for energy renovation, where the owner only has to contact one certified building contractor and to get an overall counselling on energy renovation of the entire building. Skilled craftsmen are educated under the BetterHouses program to be advisors on energy renovation.

Long-term strategy for the renovation of the national building stock
As stated in article 2a of the energy performance of buildings directive (EPBD) each Member State must notify a long-term renovation strategy (LTRS) to support the renovation of the national building stock.

On 10 March 2020, Denmark published and notified part 1[5] of Denmark's LTRS to the Commission. However, the government decided, in connection with the notification of Denmark's National Energy and Climate Plan (NECP) at the end of 2019, that the indicative milestones for 2030, 2040 and 2050 would be determined in

[5] https://ens.dk/ansvarsomraader/energibesparelser/byggeri-og-renovering

connection with the upcoming national climate action plans in order to be able to take into account possible effects of new initiatives.

On 22 June 2021, Denmark therefore notified part 2[6] of Denmark's LTRS, which contains two non-binding indicative milestones for 2030, 2040 and 2050 (see table 4.18b below). In addition, the strategy contains an explanation of how the milestones contribute to achieve the Union's energy efficiency targets in accordance with Directive 2012/27/EU on energy efficiency. Part 2 of Denmark's renovation strategy must therefore be seen in connection with part 1, in which existing and known tools in Denmark's energy renovation efforts are explained.

The determination of the indicative milestones are based on agreements such as the Climate Agreement for Energy and Industry etc. of 22 June 2020[7] and Green Housing Agreement 2020 of 19 May 2020[8].

The strategy describes various initiatives aimed at promoting the renovation of the Danish building stock and efforts aimed at insuring energy efficiency in the national building stock.

TABLE 4.18B NON-BINDING INDICATIVE MILESTONES FOR 2030, 2040 AND 2050

	2030	2040	2050
1) Reduction of the final energy consumption per m^2 for households	5%		
2) Reduction of the calculated energy consumption per m^2 for households	10%	19%	28%

[6] https://ens.dk/ansvarsomraader/energibesparelser/byggeri-og-renovering
[7] https://kefm.dk/aktuelt/nyheder/2020/jun/bred-klimaaftale-bringer-danmark-tilbage-i-den-groenne-foerertroeje
[8] https://www.regeringen.dk/aktuelt/tidligere-publikationer/groen-boligaftale-2020/

TABLE 4.19 MEASURES IN THE HOUSEHOLD (RESIDENTIAL) SECTOR

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings-formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.						2020	2030		
45	56	Table 4.19	5-HO-01: Minimum energy requirements for buildings and Energy performing certificates for buildings	Krav i Bygningsreglementet Energimærkning af bygninger	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings	Not quantified	Regulatory, Information	Related	4;2	Implemented	Denmark has a long experience with energy efficiency and energy savings in buildings. From 1990 to 2022 energy consumption for heating has been reduced by 29.7% per m2. All new buildings must, according to the Danish building code, be constructed as nearly zero-energy buildings (NZEB). The benefits of reducing energy consumption are tangible: less fossil fuel is consumed and the environment has improved substantially. Strict and progressively tightened building regulations since 1977 have ensured a stable demand for energy-efficient building technologies. Energy labelling of buildings must be implemented after finishing the construction of a building and on the sale or rental of the building - primarily heating consumption. This applies in principle for all buildings, irrespective of size, apart from production facilities, factories etc. The energy performance is expressed by a numeric indicator of primary energy in kWh/m2 per year based on the primary energy factor. The Energy Performing Certificate (EPC) consist of an energy label and an energy plan. For publicly owned buildings over 250 m2 the EPC must be prepared regularly every ten years. Furthermore all large buildings over 600 m2 which are frequently visited by the public must display a valid EPC in a prominent place clearly visible to the public. Most new buildings shall, according to the Danish Building Code, declare the total CO2-eq emission from the lifecycle of the building, according to EN 15978. The obligatory modules are A1-A3, B4, B6, C3, C4 and D. Buildings larger than 1000 m2 shall in addition to this also live up to a limit value of 12 kg CO2-eq/m2 per year using the same modules, except for D.	1997	2050	Ministry of Social Affairs, Housing and Senior Citizens (building code) and the Danish Energy Agency (EPC)	NE	IE	Link to the Danish building regulation: https://bygningsreglementet.dk/	Decarbonisation: GHG emissions and removals, Energy efficiency
46	57		5-HO-02: Ecodesign and energy labelling of electric appliances	Ecodesign og energimærkning af produkter	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_11: Efficiency improvement of appliances	Not quantified	Information	Related	4;2	Implemented	Minimum energy requirements (ecodesign) and energy labelling of appliances: The European Community also has mandatory energy requirements for some 20 energy-consuming products, such as electric motors, circulators, white goods etc. There are also voluntary labelling schemes (Energy Star, Energy Arrow, windows, boilers) for a number of products. The European Community has mandatory ecodesign requirements for more than 30 energy-related product groups, such as electric motors, circulators, white goods, etc. A majority of	1992	2050	The Danish Energy Agency, The Danish Safety Technology Authority	NE	IE		Decarbonisation: GHG emissions and removals, Energy efficiency
47	58		5-HO-03: Substitution of individual oil, gas and pellet based furnaces	Skrotningsordning for oliefyr: Tilskud til skrotning af olie-, gas- og træpillefyr ved konvertering til varmepumpe	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_14: Demand management/reduction	Not quantified	Economic, Information	Related	4;2	Implemented	This support scheme supplies subsidies for companies, which offer electric heat pumps on subscription for private year-round housing. The subsidy pool among others is designed to give aid to citizens who wish to convert to an electric heat pump, but who have limited financing opportunities. The subsidy will amount to approximately DKK 25.000 per electric heat pump on average.	2020	2026	The Danish Energy Agency	NE	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
48	59		5-HO-04: Better Houses	Bedre Bolig ordning	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings	Not quantified	Information	Related	4;2	Implemented	"BetterHouses" is a scheme (voluntary and market-driven system) from the Danish Energy Agency focusing on energy renovation of buildings. The aim is to make it easier for owners of buildings, mostly homeowners, to energy renovate by creating a "one stop shop" for energy renovation, where the owner only has to contact one certified building contractor and to get an overall counselling on energy renovation of the entire building. Skilled workmen are educated under the BetterHouses program to be advisors on energy renovation. The Danish Energy agency approves the BetterHouses firms and professionals like architects, engineers, craftsmen, energy consultants and building designers can take training courses to become BetterHouses advisors. The training is carried out at academies of higher education. A Better Houses advisor can manage the process and can follow the project all the way from plan to completed renovation.	2014	2050	The Danish Energy Agency	NE	IE		Decarbonisation: GHG emissions and removals
49	60		5-HO-05: Strategy for Energy renovation of buildings	Langsigtet renoveringsstrategi	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings	Not quantified	Information, Education, Research	Related	4;2	Implemented	The long-term renovation strategy supports the renovation of the national stock of residential and non-residential buildings. The strategy shall contribute to the fulfilment of the EU's long-term goal for 2050 of reducing greenhouse gas emissions by 80-95% compared with 1990. The goal is to achieve a highly efficient and decarbonised building stock by 2050 and facilitate the cost-effective transformation of existing buildings into nearly zero-energy buildings (NZEBs). The strategy includes the status of energy efficiency of buildings in Denmark, normative instruments (e.g. component-specific requirements in connection with renovations), financial instruments (e.g. taxes and grants) and informative instruments (e.g. information for citizens, energy rating of buildings or additional training of tradesmen).	2014	2050	The Danish Energy Agency	NE	IE		Decarbonisation: GHG emissions and removals
50	61		5-HO-07: Green renovations of social housing sector	Grønne renoveringer af almene boliger (Grøn boligaftale 2020)	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings	No quantified objective	Regulatory, Economic	Related	2;7	Implemented	On the 19 May 2020, the Government reached a political agreement to ensure green renovation of the social housing sector in 2020 and from 2021-2026. The agreement entails a structural shift in the Danish National Building Fund's support system containing a new green support criterion, a new green guarantee and a fund for experiments that will improve the energy efficiency of buildings in the social housing sector.	2021	2026	Ministry of Social Affairs, Housing and Senior Citizens	NA	IE		Decarbonisation: GHG emissions and removals

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

TABLE 4.19 MEASURES IN THE HOUSEHOLD (RESIDENTIAL) SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU		Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects																				
Interne oplysninger til EU rapporterings-formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.						2020	2030		
51	62		5-HO-08: Phasing out of oil and gas boilers by subsidies for conversion to green solutions [= 5-HO-03 changed and enhanced]	Udfasning af olie- og gasfyr v. tilskud til konvertering til grønne løsninger	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_14: Demand management/reduction	Not quantified objective	Economic	Related	2	Adopted	Reducing energy consumption by increasing energy efficiency and promoting energy saving is a very important element for Danish energy policy, hence phasing out oil-, and gas boilers alongside other less efficient heating sources by subsidies for conversion to green solutions have been essential towards fulfilling the ambitions of the climate agreements. This is through various support schemes, subsidising these conversions to more green alternatives in various models, ranging from one-time subsidies to the individual citizen to subscription solutions, which aid citizens who wish to convert to an electric heat pump, but who have limited financing opportunities.	2021	2026	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Energy efficiency, Decarbonisation: Renewable energy
52	63		5-HO-09: Increase in allocated funds for phasing out oil and gas boilers until 2025 [= 5-HO-08 further enhanced]	Øgede puljer til udfasning af olie- og gasfyr frem mod 2026	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_14: Demand management/reduction	Not quantified objective	Economic	Related	2	Adopted	Reducing energy consumption by increasing energy efficiency and promoting energy saving is a very important element for Danish energy policy. With the increased interest seen from both a political perspective besides the immense interest seen from the public, further grants have been granted to the support schemes for phasing out oil-, and gas boilers by subsidies for conversion to green solutions.	2021	2026	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals, Decarbonisation: Renewable energy
53	64		5-HO-10: Grants for green housing improvements (the Building Pool)	Tilskud til grønne boligforbedringer (grøn genopretning, bygningspuljen)	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_10: Efficiency improvements of buildings, 2_14: Demand management/reduction	No quantified objective	Economic	Related	2;8	Adopted	The Building Pool targets energy savings in private year-round housing. The subsidy pool i.e. supports the replacement of oil and gas burners with heat pumps (i.e. reduction in CO2-emissions from the individual heating sector), insulation of the climate screen and optimization of the operation of the building. In 2023, the pool is split into two pools; one for replacement of oil and gas burners with heat pumps (Heat pump pool) and one for energy optimizations i.e. insulation of the climate screen (Energy Renovation pool). The funding was split in 70% for the Heat Pump Pool and 30% for the Energy Renovation Pool in 2023. The allocation for 2024-2026 is to be decided politically but has not happened yet.	2020	2026	The Danish Energy Agency	NE	IE	The pool opened in 2020 and is set to finish in 2026.	Decarbonisation: GHG emissions and removals, Energy efficiency
107	148		5-HO-11: Grants for individual heat pump when scrapping oil- or gas boilers (The Scrapping Scheme)	Tilskud til individuelle varmepumper ved skrotning af olie-, gas- eller træpillefyr	Single	NA	Yes /	2: Energy consumption	CO2, CH4, N2O	2_14: Demand management/reduction	No quantified objective	Economic	Related	2	Adopted	The scrapping scheme targets oil, gas and biomass boiler owners who wants to change their heating source to a subscription-based heat pump. The subsidy pool i.e. supports the conversion into a green heating solution by making it possible to rent instead of buy a heat pump, i.e. for lower-income groups. The Scrapping Scheme contains 211 mio. DKK in total in 2020-2026.	2020	2026	The Danish Energy Agency	NE	IE	The pool opened in 2020 and is set to finish in 2026.	Decarbonisation: GHG emissions and removals, Energy efficiency

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

* Here "Yes" means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.5.2 CH_4 (methane)

Total emissions of methane from the energy sector account for about 1.3% of the sector's greenhouse gas emissions, corresponding to about 0.35 million tonnes CO_2 equivalents. Many small sources contribute to this overall relatively minor source of greenhouse gas emissions. The biggest single contribution comes from gas-fired CHP plants, which emit unburnt natural gas. With a view to minimising the emissions, a 1998 Statutory Order, in force from 2006 to 2013, has limited emissions of nitrogen oxides, unburnt carbon hydrides, including methane, and carbon monoxide etc.. However, the limit value for unburned hydro carbons was removed in a revision of the Statutory Order entering into force on 7 January 2013.

As of 1 January 2011 a tax on methane emissions - equal in terms of CO_2 equivalents to the CO_2 tax - from natural gas fired power plants was introduced (see chapter 4.3.3.3.).

4.3.5.3 N_2O (nitrous oxide)

Nitrous oxide accounts for 1.0%, or 0.29 million tonnes CO_2 equivalents, of the energy sector's total greenhouse gas emissions. Within energy, emissions of nitrous oxide from transport have increased since the introduction of new cars with catalytic converters in 1990. However, as the population of cars from before 1990 is almost zero today, no further increase in specific nitrous oxide emissions from cars with catalytic converters is expected.

4.3.6 Industrial Processes and Product Use (IPPU)

The greenhouse gas emissions from industrial processes and product use made up 4.0% of Denmark's total greenhouse gas emissions in 2022 (with LULUCF), of which CO_2 was the primary emission. 82.4% of the sector’s emissions are CO_2, primarily from cement production, and 16.4% are emissions of the industrial gases HFCs, PFCs, and SF_6. The remaining share comprises 1.1% emissions of nitrous oxide and less than 0.2% emissions of methane.

4.3.6.1 CO_2 - Cement production

Cement production results in large emissions of CO_2. The production process itself is very energy-intensive, and a large quantity of CO_2 is emitted in connection with the production process.

Cement production in Denmark is concentrated in a single company. About half of the emissions come from the company’s energy consumption and the other half from chalk, which is one of the raw materials used in the process. A lot has been done within the cement industry. For example, in the last 20 years the Danish cement producer has significantly reduced its CO_2 emissions per tonne cement produced.

Since 2005, all CO_2 emissions from cement production in Denmark are subject to the EU ETS.

4.3.6.2 N_2O - Production of nitric acid

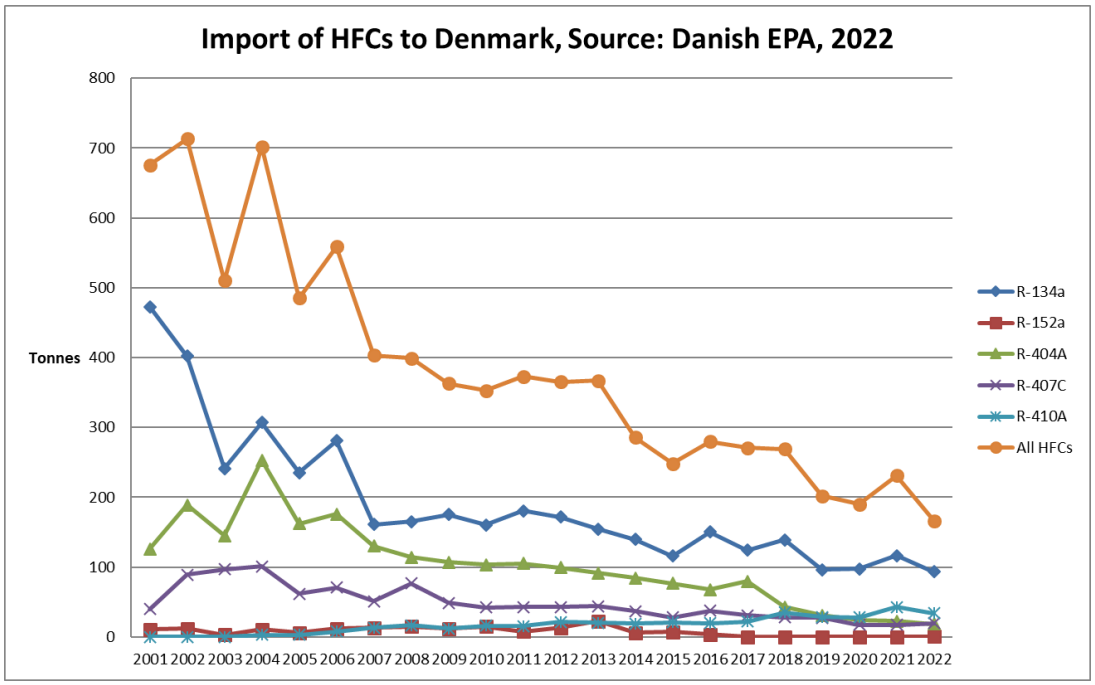
In the period 1990-2004, Danish greenhouse gas emission inventories included emissions of nitrous oxide (N_2O) from the production of nitric acid in connection with the production of fertilizer from a single plant in.

In mid 2004, the owner decided to stop production of fertilizer and so production of nitric acid in Denmark. Emissions of nitrous oxide from production of nitric acid in 2003 corresponded to 0.9 million tonnes CO_2 equivalents. In 2004 emissions were about one-half of this, and from 2005 they ceased entirely cf. market conditions for production of fertilizer in Europe.

4.3.6.3 HFCs, PFCs and SF_6 - Consumption of these substances

Emissions of the so-called industrial greenhouse gases HFCs, PFCs, and SF_6 are in accordance with the emission inventories included in the industrial sector. This is also the case for emissions from other sectors during use and scrapping of equipment containing HFCs, PFCs and SF_6. These gases are used for several purposes including as refrigerants and blowing agents, etc. (HFCs) and insulator gas in high voltage switchgear (SF_6). Since there is no production of these gases in Denmark, all emissions are related to the import of the substances. The developments in imports of chemical mixtures containing HFCs in recent years are shown in Figure 4.3.

FIGURE 4.3 IMPORT OF HFCS TO DENMARK 2001-2022 IN TONNES HFCS
Source: Danish Environmental Protection Agency



The Danish regulation of emissions of the industrial greenhouse gases (HFCs, PFCs, and SF_6) is 2-phased, since there is a consumer tax on the import of the substances and also a statutory order regulating the use of the gases in new facilities and products. Both measures are further described below.

According to model-based calculations, the combined effect of taxation and regulation of F-gases compared to a scenario with only the effect of EU-regulation. The accumulated emission savings over the period from 2001 to 2022 is estimated at approximately 8 million tonnes of CO_2 equivalents.

4.3.6.3.1 Taxes on HFCs, PFCs and SF_6

Taxes corresponding to their GWP have been imposed on each of the greenhouse gases from March 2001 in combination with the Danish CO_2 tax of approximately

DKK 0.19 per kg CO_2 as described in section 4.3.3. This means that HFC-134a is subject to a tax of DKK 270/kg, as it has a GWP of 1,430.

The tax is imposed on the substances on importation because none of them is produced in Denmark. The tax is payable whether the substances are imported as pure substances or as part of imported products. If the content in the products is not known, the tax is based on a fixed tariff.

The tax is payable on a wide range of products, including:

- Refrigerating and freezing plants
- Air-conditioning plants
- PUR foam for cooling plants, district heating pipes, insulated gates and doors, panels for refrigeration and freezer rooms, extruded polystyrene for insulation (XPS foam), jointing foam
- Spray canisters
- Insulation gas

The tax is also payable on services on existing and new installations/products.

4.3.6.3.2 Regulation of HFCs, PFCs and SF_6

On 15 July 2002, a statutory order on the regulation of certain industrial greenhouse gases came into force.

This Statutory Order includes a general ban on the use of industrial greenhouse gases in a great number of new facilities and products from 1 January 2006, including household cooling and freezing appliances, PUR foam, etc. However, some products and applications are exempted from the ban. This applies, for example, to servicing existing plants, mobile cooling plants, including mobile air conditioning plants, the use of HFCs in cooling and air conditioning plants with fillings between 0.150 and10 kg HFC, SF_6 in high voltage plants, etc. The Statutory order was revised in May 2017 in order to reflect the development of new low GWP, fluorinated refrigerants such as HFOs. The only change is that the revised order does not cover HFOs. All other provisions remains unchanged. The Statutory Order was revised again in November 2018 allowing the use of HFCs in certain hermetically sealed heat pumps in amounts up to 50 kg. The purpose of the revision was to remove barriers for the use of medium size heat pumps in the energy system.

In May 2021 the general exemption for equipment with fillings between 0.150 and 10 kg HFC was changed so that this exemption only applies to hermetically sealed equipment. For other types of equipment a limit of 5 tons of CO_2 equivalents was introduced. The purpose is to encourage the use of low GWP refrigerants.

To ensure the best possible implementation of the phase-out dates for the refrigeration sector, a total of DKK 12 million was reserved for the period 2005-2007 for development of alternatives and for subsidies for implementation of the alternatives developed in the previous years. A knowledge centre for HFC-free cooling has been established. This centre disseminates knowledge and offers technical assistance.

As from 2015 to 2017 DKK 1,5 million is reserved for promoting cooling equipment relying on natural refrigerants and retrofitting existing equipment to use refrigerants with lower GWP.

To ensure regeneration and environmentally friendly destruction of newly developed flammable fluorinated refrigerants DKK 2.5 million is granted from 2017 to 2019 to upgrade the existing return system (see Chapter 4.3.4).

In 2019 an information campaign costing 300.000 DKK aiming at preventing illegal imports of HFC for mobile AC was launched.

An overview of the above measures regarding industrial processes is given in table 4.20.

TABLE 4.20 MEASURES IN THE INDUSTRIAL PROCESSES SECTOR

Name of mitigation action	Included in with measures GHG projection scenario	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**	
										2020	2030
6-IP-01: Regulation of use of HFCs, PFCs and SF6 (phasing out most of the uses) - Statutory order on fluorinated greenhouse gasses	Yes	Industry/Industrial Processes	HFCs, PFCs, SF6	4_28: Replacement of fluorinated gases by gases with a lower GWP value	Regulatory	Implemented	Import, sale and use of the substances or new products containing the substances is forbidden from 1 January 2006 with some exceptions.	2006	The Danish Environmental Protection Agency	IE(G1)	IE(G1)

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

* Here "Yes" means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.7 Agriculture

The primary occupational sectors agriculture, forestry and fisheries are generally considered as one single economic sector in Denmark, although the importance of the individual sectors differs greatly with respect to Denmark's emissions and uptake of greenhouse gases. Agricultural farms have emissions of primarily methane and nitrous oxide as described in this section. Liming, urea application and other carbon-containing fertilizers are minor sources of CO_2 emissions. The CO_2 emissions by sources and removals by sinks in relation to Denmark's agricultural soils and forests are included under the LULUCF sector described in Section 4.3.7. CO_2 emissions from energy use in agriculture are included under energy (section 4.3.4).

The agricultural sector contributes in 2022 with 27.7 % of the total emission in CO_2 equivalents (excl. LULUCF and indirect CO_2) and the major part is related to the livestock production. Since 1990, the agricultural emission has decreased 16.7 % (mainly due to a decrease in the N_2O emission). N_2O emissions from agriculture decreased by 33% and the CH_4 emissions from agriculture increased by 2% from 1990 to 2022. Agriculture is the overall most important sector regarding emissions of N_2O and CH_4. In 2022, the contribution of N_2O and CH_4 from agriculture to the national total emission of these gases was 89% and 81%, respectively (Nielsen et al., (2022a)).

Policies and measures relevant for the agricultural sector which have affected or will affect the sector's greenhouse gas emissions are:

- Ban on burning of straw on fields
- Action Plans for the Aquatic Environment I and II and Action Plan for Sustainable Agriculture
- Action Plan for the Aquatic Environment III
- Ammonia Action Plan
- Action Plan for Joint Biogas Plants and subsequent follow-up programmes, including the New Energy Policy Agreement
- Environmental Approval Act for Livestock Holdings
- Agreement on Green Growth 2009
- Agreement on Green Growth 2.0
- Subsidy for conversion of arable land on organic soils to nature
- Political Agreement on a Food and Agricultural Package and the political Agreement on Targeted Regulation and subsequent agreements [such as the national budget for 2020, which includes allocation of additional funding for afforestation and environment- and climate-technologies]
- Agreement on Nature (the Nature Package)
- Advisory task force on barriers for reducing the hydraulic retention time of manure before being delivered to biogas plants (PSO Agreement of 17 November 2016)
- National Green Climate Fund – Initiatives in agriculture 2017
- GHG accounting and awareness building at farm-level. Climate-friendly feed production for pigs. Promotion of green bio-refining. (Agreement of 2nd May 2019)
- Multifunctional Land Reparcelling Fund (Agreement of 19th September 2019)

- Agreement on a Green Transition of the Agricultural Sector (4th October 2021)
- Rural Development Programme 2014-2022 – a scheme for permanent extensification (December 2014 and June 2023)[9]
- The Danish Strategic CAP Plan 2023-2027 (31st August 2023).

Table 4.21 contains further information on the measures in the agricultural sector.

Stronger research efforts in agriculture affecting all greenhouse gases

Development of new solutions and new technologies could support a climate-friendly food production in the future. At the same time, there is a need to know more about how greenhouse gas emission reductions can be obtained in the best way with the technologies we already have available today.

Funded by the National Green Climate Fund other research work in agriculture was initiated in 2019 as mentioned in chapter 4.3.4:

- Climate accounts and information on individual farm-level
- Climate-friendly feed production
- Promotion of green bio refining
- Promotion of green building

Further information is included in chapter 4.3.4.

In 2019, DKK 90 million was allocated for climate change mitigation research in agriculture in the period 2019-2021 and a research programme has been launched consisting of 10 projects. An additional DKK 30 million has been allocated to this initiative in 2022.

Furthermore, the Danish Green Development and Demonstration Programme (GUDP) annually allocates subsidies for, among other things, climate research and development in agriculture. The program has an annual budget of approximately DKK185 million.

In 2021, 2022 and 2023, a total of DKK 435 million has been allocated to a Research program for farm-level inventories of greenhouse gas and nutrient emissions. The purpose of this research program is to contribute to a robust level of knowledge on significant emissions of GHG and nitrogen at farm-level.

In 2023, DKK 110 million has been allocated to further research in three development initiatives with greenhouse gas reduction potentials in the agricultural sector, hereunder biorefining of waste and residues (biochar), manure management and feed additives for reducing the production of enteric methane in dairy cattle. All initiatives are part of the Agreement on a Green Transition of the Agricultural Sector from October 2021.

In 2024, a further DKK 50 million has been allocated (through the Research Reserve) to research and development in mitigation strategies and improved farm-level inventories of GHG emissions and nitrogen leaching.

[9] https://agriculture.ec.europa.eu/common-agricultural-policy/rural-development/country/denmark_en

4.3.7.1 CH_4 (methane)

Methane emissions mainly stem from the agricultural sector, contributing, in 2022 with 80.6% of total Danish CH_4 emissions, corresponding to 7.1 million tonnes CO_2 equivalents (Nielsen et al., (2022a). Agricultural systems have two main sources of methane. Methane is formed through enteric fermentation of feed during digestion in livestock (58%) and management of animal manure (42%).

Danish agriculture's biggest contribution to the methane emissions comes from dairy cattle.

In the digestion process, methane is a by-product of the fermentation of feed in the rumen, primarily from grass and roughage fodder such as grass, grass silage and maize silage. In addition, methane is formed by microorganisms during conversion of carbon in the manure under anaerobic conditions, increasing with increasing temperatures and pH. These conditions especially occur in manure stores and housing systems with slurry (liquid manure) or deep litter. Methane from manure management in Denmark is primarily linked to pig production.

The emission of methane from agriculture has remained more or less stable in the period from 1990 to 2022, and the total CH_4 emission from the agriculture sector has increased 2 % in the same period. At present, the number of dairy cows in Denmark is projected to decrease towards 2035 in combination with an increased milk production per dairy cow. At the same time, the CH_4 emissions from manure are expected to slightly decrease due to an increasing share of the manure expected to be treated in biogas plants or acidified in the livestock housing system (the stable). The effect on methane emissions from acidification needs further documentation. As a part of the Agreement on a Green Transition of the Agricultural Sector of October 2021 and the included requirement for reduction of methane from enteric rumen fermentation, the use of feed additives, inhibiting production of methane from enteric rumen fermentation, is expected to decrease the emissions of methane from dairy cattle.

4.3.7.1.1 Biogas

Biogas from digestion of manure and organic wastes carries a number of potential advantages when used to substitute fossil energy: reductions in emissions of greenhouse gases, better utilization of manure as fertiliser, recycling and use of organic wastes for energy and fertiliser purposes etc. However, there are also environmental challenges for example increased ammonia emissions and odour from the biogas plants.

As part of the Danish Rural Development Programme 2007-2013, financial support has been provided to investments in biogas plants in 2010 and in 2012. In 2012 support was awarded to both new and existing biogas plants to the amount of DKK 262 million.

In order to stimulate expansion of the biogas sector the subsidy on the sales price of electricity production based on biogas was adjusted by the Energy Policy Agreement of 22 March 2012. The Agreement resulted in an amendment to the Promotion of Renewable Energy Act of 27 December 2008.

The Energy Policy Agreement continued funding biogas for combined heat and power (CHP) and introduced subsidy equality so that biogas sold to the natural gas grid would receive the same subsidy as biogas used at CHP plants. In addition the agreement also introduced a new subsidy when biogas is used in industrial processes, as a fuel for transport or for the production of heat.

As part of the PSO Agreement of 17 November 2016, it was decided to establish and fund an advisory task force with the aim of investigating and removing barriers for reducing the hydraulic retention time of manure before being delivered to biogas plants. This included an earmarking of DKK 9.0 million for developing solutions in existing biogas plants and associated suppliers of feedstock to reduce the retention time of manure in the housing system prior to the treatment in the biogas plant. This is expected to increase the production of biogas per unit input of manure while at the same time reducing emissions of methane from the housing system, and thus reduce methane emissions while increasing biogas production at the same time.

The 2022 greenhouse gas emission projection expects an increase in biogas production from 27 PJ in 2021 to 38 PJ in 2025 with a peek of 49 PJ in 2030 when considering biogas facilities mainly based on agricultural sources.

As part of the 2018 energy agreement, it was decided to no longer permit new applicants to the existing subsidy schemes for the use of biogas from January 1st 2020.

As part of the Climate Agreement for Energy and Industry 2020, six tenders from 2024-2030 for the production of biogas and other green gases were agreed upon, with an expected production of 10 PJ in 2030. Subsequently, the six tenders have been reduced to five tenders with an expected production of 6 PJ in 2030. The production is, however, uncertain as no state aid approval has been obtained for the scheme.

In 2019, a targeted effort to reduce methane emissions from Danish biogas plants was initiated. The findings from the project showed higher emissions than previously assumed from the production of biogas. This resulted in the formulation of new regulation, which entered into force 1 January 2023. The regulation dictates the reporting of annual mandatory leak detection and repair to the Danish Energy Agency, regular self-monitoring, as well as a 1 % limit on methane loss from upgrading facilities. It is expected that a new campaign to measure the effect of the regulation will take place in 2025.

4.3.7.2 N_2O (nitrous oxide)

Agriculture is the largest source of nitrous oxide emissions in Denmark. In 2022, 89% of the total Danish N_2O emissions came from agriculture, corresponding to 4.2 million tonnes of CO_2 equivalents (Nielsen et al., (2024a) – tbp.). The process of emission of N_2O occurs in some types of manure storage facilities (in 2022, N_2O from manure management constituted 12.6% of total N_2O emissions in agriculture) and during conversion of mineral and organic bound nitrogen (e.g. in manure and applied wastewater sludge) in the soil. Some of the leached nitrogen is also converted into nitrous oxide. Nitrogen entering the soil with applied fertiliser and manure, and through plant residue, is the main sources of nitrous gas emissions (in 2022, N_2O emissions from agricultural soils constituted 87.4% of total N_2O emissions in agriculture).

Likewise, ammonia (NH_3) volatilisation contributes to the greenhouse effect because some of the ammonia nitrate ends up as nitrous oxide in the atmosphere. Ammonia volatilisation into the atmosphere stems almost exclusively from agriculture, through conversion processes from manure, fertiliser, sludge, crop residue and treatment of straw with ammonia. In particular, the emissions occur during handling of manure in

animal housing, during storage and transport of manure, and from grazing animals[10] (*Nielsen et al., (2018a)*).

The main reason for the drop in the overall emissions of N_2O from the agricultural sector of 33% from 1990 to 2022 is enforced legislation (see below) to reduce nitrogen leaching by improving the utilisation of nitrogen binding in manure, as well as measures to reduce the application of mineral fertilizers to soils. The legislation has resulted in a considerable reduction in the use of mineral fertilisers. It has also helped, that the market driven effort to improve the feeding efficiency (and thereby also the farmers economy) have reduced the nitrogen excreted per unit livestock produced. The basis for the N_2O is then reduced (*Nielsen et al., (2017a)*). Implementation of the Action Plans for the Aquatic Environment II and III contribute the most to this reduction[11,12]. Further projected decrease in N_2O emissions towards 2035 is mainly attributed to areas being taken out of agricultural production for urban development and infrastructure etc., and to anticipated increased shares of organic agriculture (DCE, December 2014).

In 2016, the Political Agreement on a Food and Agricultural Package from 2015 allowed Danish farmers to use more nitrogen in the fields through a lifting of the reduced fertilizer standards for nitrogen. The potential slight increase in future N_2O emissions resulting from this policy change is sought mitigated by correspondingly implementing measures for ensuring optimization of N-binding and carbon sequestration in agricultural soils (e.g. catch crops).

In 2021, the Agreement on a Green Transition of the Agricultural Sector (further elaborated in section 4.3.7.2.5), introduced measures to reduce the nitrogen discharge to coastal waters by approx. 8,000 tonnes in 2027. The effort is substantial and in line with the requirements of the EU Water Framework Directive. As a part of the agreement, DKK 249 million (approximately EUR 33 million) has been allocated to initiate the development of a new farm-level nitrogen regulatory model, which is expected to reduce nitrogen emissions by 6,500 tonnes by 2027. The regulatory model is expected to introduce farm-level measures i.e. crop selection, catch crops and various other management instruments into the regulation. It is estimated that the efforts specifically targeted nitrogen reduction (by 8,000 tons) will also reduce greenhouse gas emissions by 0.31 million tons of CO_2e in 2025 and 0.64 million tons of CO_2e in 2030.

4.3.7.2.1 Action Plans for the Aquatic Environment I and II and Action Plan for Sustainable Agriculture

One of the main purposes of the Action Plans for the Aquatic Environment and the Action Plan for Sustainable Agriculture was to reduce agriculture's nutrient losses to the aquatic environment.

The action plans was implemented as regulation of farmers' behaviour. The Action Plan for the Aquatic Environment I was initiated in 1987, and the Action Plan for Sustainable Agriculture in 1991. In particular, these action plans included requirements concerning closed periods for applying slurry, ensuring a better utilisation of manure as well as

[10] Mikkelsen et al., 2005: Mikkelsen, M.H., Gyldenkærne, S., Poulsen, H.D., Olesen, J.E. & Sommer, S.G. (2005). Opgørelse og beregningsmetode for landbrugets emissioner af ammoniak og drivhusgasser 1985-2002. Arbejdsrapport fra DMU Nr. 204 (in Danish).

[11] Olesen et al., 2004: Olesen, J.E., Petersen, S.O., Gyldenkærne, S., Mikkelsen, M.H., Jacobsen, B.H., Vesterdal, L., Jørgensen, A.M.K., Christensen, B.T., Abildtrup, J., Heidmann, T. & Rubæk, G. (2004). Jordbrug og klimaændringer - samspil til vandmiljøplaner. DJF rapport Markbrug nr. 109. (in Danish).

[12] Olesen, 2005: Olesen, J.E. (2005). Muligheder for reduktion af drivhusgasemissioner i jordbruget. I: Olesen, J.E. (red). Drivhusgasser fra jordbruget - reduktionsmuligheder. DJF rapport Markbrug nr. 113, s. 12-32. (in Danish).

minimum slurry storage capacity, mandatory incorporation of manure into the soil shortly after application, and winter green fields. The Action Plan for the Aquatic Environment II from 1998 contained a number of additional measures, including re-establishment of wetlands, afforestation, agreements on environment friendly agricultural measures, establishment of organic farming on an additional 170,000 ha, improved utilization of fodder, reduced animal density, use of catch crops, reduced fertilisation norms, and increased efficiency in use of nitrogen in manure. The aim of the political plans, which has now been reached, was to reduce nitrogen leaching by 100,000 tonnes N/year up to the year 2003[13]. The benchmark for the evaluation of the agricultural nitrogen leaching, as part of the final evaluation of the Action Plan for the Aquatic Environment II in December 2003, was 311,000 tonnes N per year. The evaluation showed that measures already implemented in addition to the measures agreed upon and financed by Action Plan II would result in a reduction of the total nitrogen leaching from agriculture (root zone and stable and storage facilities) of around 149,000 tonnes N per year. This corresponds to a reduction of around 48% of 311,000 tonnes N. After taking into account the calculation uncertainties, the nitrogen discharge reduction goal of 49% was achieved.

Specifically, these action plans have reduced the emissions of nitrous oxide. There have presumably also been small effects on methane emissions from manure stores, particularly as a consequence of increased use of anaerobic fermentation of manure in biogas plants and the reduced use of deep litter. The increased use of catch crops and larger overall areas with organic farming would also be expected to an increased storage of carbon in the soil.

Most of the changes in nitrous oxide emissions from agriculture through the period since 1990 can be attributed to these action plans. However, it has been calculated that even without the action plans there would have been a reduction in emissions, although to a much lesser extent, due to an overall optimization and improvement of farming techniques and management practices. The effect of these action plans on emissions of nitrous oxide has been calculated at about 2.2 million tonnes CO_2 equivalents/year[19]. There are no estimates of the effect of the Action Plans I and II for the Aquatic Environment and the Action Plan for Sustainable Agriculture on carbon storage in the soil.

As stated in section 4.3.2.7 and further elaborated in section 4.3.7.2.5, the Agreement on a Green Transition of the Agricultural Sector from 2021, introduced measures aimed at reducing nitrogen discharge to coastal waters by approx. 8,000 tons in 2027, associated with an estimated reduction in greenhouse gas emissions by 0.31 million tons of CO_2e in 2025 and 0.64 million tons of CO_2e in 2030.

4.3.7.2.2

4.3.7.2.3 Action Plan for the Aquatic Environment III and the agreements of Green Growth

With the political agreement on the Action Plan for the Aquatic Environment III (APAE III) of 2 April 2004, a number of measures were implemented to follow up on the

[13]Grant et al., 2000: Grant, R., Blicher-Mathiesen, G., Jørgensen, V., Kyllingsbæk, A., Poulsen, H.D., Børsting, C., Jørgensen, J.O., Schou, J.S., Kristensen, E.S., Waagepetersen, J. & Mikkelsen, H.E. (2000). Vandmiljøplan II - midtvejsevaluering. Miljø- og Energiministeriet, Danmarks Miljøundersøgelser, Silkeborg, Denmark. 65 pp (in Danish).

results attained via the previous plans. This third action plan contains targets with respect to nitrogen, phosphorus, sensitive natural areas, and slurry odour. It is a 10-year agreement, and was, in 2008 and 2011, evaluated with respect to the Water Framework Directive and the Habitats Directive. Special emphasis in the APAE III was on the use of catch crops, stricter requirements for use of manure as well as afforestation and agro-environmental measures. In addition, the agreement includes research initiatives aimed at slurry odours and reduction of emissions of nutrients, e.g. research into technology to manage slurry, ammonia etc. The effect of the action plan for the period 2008-2012 was projected at 0.2 million tonnes CO_2 equivalents/year[14].

In 2008 the APAE III was evaluated on results, adequacy of tools and economic aspects to ensure that activities and expected results were achieved. The main conclusions for a number of measures were that implementation and effects have not been as anticipated. At the midterm evaluation of the APAE III, covering the years 2004-2007, no reductions in the production of animal manure were recorded, nor any decrease in the use of mineral fertilizers. Furthermore, no significant reductions in nitrogen leaching were proved for the investigated period (Waage Petersen et al., 2008).Thus, no change in the key parameters that provided reduction in the emissions of greenhouse gasses in the earlier action plans for the aquatic environment have happened so far, and it may therefore be difficult to reach the initial target.

In 2009, the Danish government launched the Green Growth Agreement (GGA) – as a plan for ensuring better conditions for nature and the environment while allowing agriculture to develop as a business. The GGA is a long-term plan for Danish nature, environment and agriculture with the purpose of ensuring that a high level of environmental, nature and climate protection goes hand in hand with modern and competitive agriculture and food industries.

The GGA was augmented in 2010 by the Green Growth Agreement 2.0, containing a series of initiatives to improve agriculture and food sector growth conditions and thus help to secure employment on farms, in the food industry and downstream industries. Furthermore, the GGA 2.0 supported the ongoing development of bioenergy with the aim of contributing to support Denmark's target of 30 per cent renewable energy by 2020 and fulfilment of Denmark's climate goals.

The GGA contains targets with respect to discharges of nitrogen and phosphorus to the aquatic environment, protection of nature and biodiversity, development of renewable energy in the agricultural sector including biogas plant, reduction of harmful pesticides, development of the organic sector and strengthened initiatives within research and development within the agricultural and food sectors.

The GGA also dealt with the problems previously encountered in achieving the expected goals through the APAE III. The measures in the GGA likewise pursued the achievements of the objectives of the Nitrates Directive on reducing discharges of nitrogen and phosphorus, as the target in APAE III were included in the GGA target. Different from the former APAE's were also the switch from a target on N leaching from the root zone to a target on N discharge to the aquatic environment. As the GGA worked to implement the EU Water Framework Directive, some measures were targeted sub-catchment while some measures were general rules.

[14] Olesen et al., 2001: Olesen, J.E., Andersen, J.M., Jacobsen, B.H., Hvelplund, T., Jørgensen, U., Schou, J.S., Graversen, J., Dalgaard, T. & Fenhann, J. (2001). Kvantificering af tre tiltag til reduktion af landbrugets udledning af drivhusgasser. DJF-rapport Markbrug 48. (http://web.agrsci.dk/djfpublikation/djfpdf/djfm48.pdf , in Danish).

The initiatives incorporated in the GGA were projected to reduce the agricultural sector's overall emissions of greenhouse gases by about 800,000 tonnes of CO_2 equivalents annually. Of this, about 400,000 tonnes reduction were expected to be derived from a green, market-based re-structuring of nitrogen regulation.

4.3.7.2.4 Environmental Approval Act for Livestock Holdings

The Environmental Approval Act for Livestock Holdings was implemented on 1 January 2007, providing national minimum requirements for environmental protection (odour, ammonia, nitrate, phosphorous, landscape, etc.) when livestock holdings are established, expanded or changed. The purpose of the Act was also to ensure the use of best available techniques (BAT).

The measures covered by the Environmental Approval Act for Livestock Holdings in 2007 were:

- 300 m buffer zones around ammonia-sensitive areas where no extension of livestock farms can take place if such an extension would lead to increased ammonia deposition in natural areas vulnerable to ammonia.
- Demand for a general reduction of ammonia emissions relative to a production facility with the lowest ammonia emission norm: 2007: 15%, 2008: 20%, 2009: 25%.
- Demands for injection of animal slurry on black soil and grass within buffer zones (1 km from vulnerable natural areas and, from 2011, in the whole country).
- Demand for fixed cover on most new containers for solid manure and slurry tanks (if they are within a distance of 300 meter to neighbours or vulnerable natural areas).
- Environmental standards and limits for nitrate-leaching to surface waters and groundwater depending on vulnerability, e.g. denitrification capacity and standards for phosphorous surplus depending on soil type and drainage.
- Environmental standards and limits for maximum deposition of ammonia on vulnerable nature and maximum odour impact on neighbours and cities.

The effect of these measures on greenhouse gas emissions has not yet been quantified.

The Environmental Approval Act for Livestock Holdings was changed in 2011, and the environmental standards for ammonia were heightened trough several measures. The general reduction goal was increased to a reduction of 30%, the specific ammonia reduction requirements were introduced with a maximum for total deposition to certain ammonia sensitive areas. This replaced the 300 meter buffer zones. In general this led to an overall tightening of the ammonia reduction with local exceptions.

In 2017 the act was once again changed, introducing a new permit scheme based on the size and character of the floor area, where animals are kept. In this sceme the permit is expressed in square meters as opposed to the former sceme based on number of animals. The environmental standards for ammonia were maintained on the same level.

Finally the act has also been revised in 2023 to form the basis for implementing specific measurements to reduce greenhouse gasses from livestock production. As of may 2023 frequent removal of manure from pig houses is required corresponding to an effect of 0.16 million ton of CO_2e per year in 2030. In 2025 it is expected to also require a

reduction of methane emissions from cattle corresponding to an effect of 0.16 million ton of CO_2e per year in 2030.

4.3.7.2.5 Political Agreement on a Food and Agricultural Package, the political Agreement on Targeted Regulation and the Agreement on a Green Transition of the Agricultural Sector

In 2015 the Green Growth Agreement was replaced by the Political Agreement on a Food and Agricultural Package (FAP) which ensures better production conditions for farming, while at the same time handling a number of the key environmental challenges.

The agreement includes a diverse package of measures designed to make a shift in the way environmental regulation in the agricultural sector is carried out, from a general regulation to a more targeted approach. The fertilization standards for the agricultural sector was lifted to the level of economic optimum and a new targeted regulation based on specific environmental goals for the aquatic environment and ground water resources was introduced in 2019.

The re-establishment of wetlands, rewetting of organic soils and afforestation (conversion of arable land) remain important measures to reduce the loss of nitrogen to the aquatic environment. As a part of the FAP a comprehensive support scheme for catch crops was also introduced. The agreement also included changes to the regulation on the use of catch crops in Danish agriculture: a requirement of catch-crops as compensation for livestock-related nitrogen leaching and additional catch-crops as part of a targeted regulation. The aforementioned regulatory schemes on catch crops were implemented in addition to the already existing two other schemes, covering mandatory catch crops and catch crops as part of the EU requirement of environmental focus areas.

In 2018 an additional agreement on Targeted Regulation was agreed upon. In addition to catch crops measures such as energy crops, reduced fertilizer/manure application, fallow land etc. was introduced as a part of the scheme. Fonds were also allocated to develop technologies from biorefining from grass with the aim of commercializing green bio refining and thus increase the demand for grass and other crops with lower climate- and environmental footprint.

As a part of the Political Agreement on a Food and Agricultural Package, funds were also allocated for afforestation, environmental and climate technologies and conversion of arable land on organic soils to nature under the Danish Rural Development Programme funded by the European Agricultural Fund for Rural Development (EAFRD). As a part of the agreement on the national budget of 2020, an additional 35 mio. DKK have been allocated for afforestation purposes and 170 mio. DKK for investments at farm-level, including environmental and climate technologies.

In 2021, the Political Agreement on a Food and Agricultural Package (FAP) was replaced by the Agreement on a Green Transition of the Agricultural Sector (4 October, 2021). The agreement consists of directly implementable initiatives as well as initiatives with potential depending on research and demonstration activities.

Importantly, the agreement contains a binding reduction target for the agricultural and forestry sector of 55 to 65 percent CO_2e reduction in 2030 compared to the emissions in 1990. According to estimates when the agreement was reached, this equals a reduction of approximately 6 to 8 million tons CO_2e. A binding target implies that the reductions must achieved in one way or another, and it therefore requires that agriculture delivers a

significant contribution to the national 70 percent reduction target in 2030 included in the Danish Climate Act.

According to estimates from when the agreement was reached, the initiatives in the agreement that are ready for implementation, are expected to deliver a total reduction in GHG-emissions of 1.9 million tons CO_2e by 2030. Part of the GHG-reductions will occur in the LULUFC-sector. The initiatives include restoration of peatlands (ambition of restoring 100,000 hectares), reduction of nitrogen emissions to the environment, greenhouse gas reducing requirements in the animal production sector and increased afforestation.

The agreement includes a number of development-initiatives, with potentials depending on research and demonstration activities. Collectively, they were – at the time when the agreement was reached – estimated to have the potential to reduce GHG-emissions by additionally 5 million tons CO_2e by 2030. The estimated effects of the agreement are under consolidation. The initiatives include research in methane reducing feed additives to livestock, more efficient handling of manure in farm and field, and further development of pyrolysis technology, which can transform agricultural residues into fuel and biochar. Moreover, research and development of a farm-level emissions model that will enable accounting and regulation of the emissions of greenhouse gasses from the individual farm is a part of the agreement.

Some of the initiatives of the agreement are implemented through the Danish Strategic CAP Plan 2023-2027. The reform of the EU's Common Agricultural Policy (CAP) offers many new opportunities for a more green agricultural production. A key element in the new CAP reform is a greater focus on green initiatives, where income support to farmers is used to give incentives to switch to more sustainable production and thus support the green transition of the sector.

With the agreement, Denmark fulfils the EU requirement that at least 25 percent of the budget for direct payments goes to green initiatives. Overall, almost DKK 27 billion (approximately EUR 3.6 billion), including DKK 4 billion (approximately EUR 0.5 billion) in additional national funds, are targeted towards the green transition of the agricultural sector. Six new support schemes (eco-schemes), as part of the direct payment system, were established, supporting environmentally and climate friendly farming practices, including organic farming area support.

4.3.7.2.6 Subsidy for conversion of arable land on organic soils to nature

Cultivated organic soils emits large amounts of CO_2. In Denmark approximately 46,000 hectares of organic soils (>12% organic carbon) were cultivated in 2022. With reference to the Danish soil classification, which defines soils with >6% organic carbon content as organic, there is approximately an additional 72,000 hectares under agricultural practise (a total of approx. 118,000 hectares in 2022)[15].

In 2014 the Danish Government adopted a subsidy scheme for conversion of arable land on organic soils to natural habitats under the framework of the common agricultural policy (CAP). This scheme is now a part of the Agreement on the Food and Agricultural Package.

[15] Beucher A, et al. 2023. Updating the Danish peatland map with a combination of new data and modelling approaches. Advisory report from DCA – Danish Centre for Food and Agriculture, Aarhus University, 66 pages. Submitted 19.12.2023. T_rv2022_Rapport_1912_2023rev.pdf (au.dk)

The objective of the scheme is to reduce agricultural emissions of greenhouse gases from organic soils through less intensive agricultural operations. The initiative also offers opportunities for synergies in relation to reduced discharges of nitrogen into watercourses, lakes and fiords as well as for increased biodiversity. As a part of the Agreement on the Food and Agricultural Package the scheme was extended to 2020. The scheme was co-financed by the Danish rural development by the European Agricultural Fund for Rural Development (EAFRD).

In September 2019, an Agreement was made on establishing a Multifunctional Land Re-parcelling Fund 2019-2021. The objective was to facilitate re-parcelling of land and thereby obtain synergies between agricultural production and biodiversity, climate, environment, recreation and rural development.

In 2021, the Agreement on a Green Transition of the Agricultural Sector includes the ambition of restoring and rewetting 100,000 hectares of carbon rich peat soils including adjacent mineral soils before 2030 with the purpose of reducing both greenhouse gas and nitrogen emissions from agricultural soils and forests in Denmark. DKK 4.4 billion (approximately EUR 590 million) has been allocated to restore natural hydrology on 50,500 hectares of agricultural land, including previous political agreements, and another 38,000 hectares for extensive management.

4.3.7.2.7

4.3.7.2.8 Bio-refining

Bio-refining can produce a range of products such as inputs to biogas production, protein and fodder and other higher value products for use in e.g. the chemical and pharmacological industry. As mentioned in chapter 4.3.4, the 1st allocation of the budget under the National Green Climate Fund in June 2017 included an earmarking of 8 million DKK as support in 2017 for pilot-scale bio-refinery projects based on non-food biomass. Commercialization of the bio-refining sector can facilitate demand for crops such as grasses with higher associated environmental and climate benefits than for conventional crops like corn or cereals. In addition, bio-refining is considered to be essential in realizing the bio-economy potential within Danish agriculture and other connected sectors.

In 2019, additional funds have been allocated through the National Green Climate Fund for promotion of green bio refining (see chapter 4.3.4).

In 2021, DKK 260 million (approximately EUR 35 million) was allocated from 2022-2026 to a new support scheme for biorefining of grass in order to develop the production of new sources of plant-based protein for animal feed. Additional DKK 10 million (approximately EUR 1,3 million) were allocated to the schemes in 2023 to accomodate the demand for funds and increase the incentive to develop green bio-refining through funds.

4.3.7.2.9 Promotion of precision agriculture, i.e. fertilization.

Since 2021, the use of precision fertilization has been a general measure in the Danish nitrogen regulation. With the use of high-tech solutions such as remote sensing, high precision positioning systems, sensors and variable rate technologies cultivation is optimized resulting in less nitrogen leaching from the fields. There have been found to

be positive climate mitigation effects from precision farming. However, more knowledge beyond the existing initiative is needed in order to quantify the effect.

TABLE 4.21 MEASURES IN AGRICULTURE, FORESTRY AND FISHERIES (SEE ALSO TABLE 4.25 (LULUCF))

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mld			- in national language									Related ?	No.					2020	2030		
55	69	Table 4.21	7-AG-04f: Environmental Approval Act for Livestock Holdings	Miljøgodkendelse af dyrehold	Single	NA	Yes /	5: Agriculture	CH4, N2O	6_39: Reduction of fertilizer/manure use on cropland, 6_40: Improved livestock management, 6_42: Improved animal waste management systems	Not quantified	Regulatory	Related	4;2	Implemented	The measures covered by the Environmental Approval Act for Livestock Holdings are: • 300 m buffer zones around ammonia sensistive areas where no extension of livestock farms can take place if such an extension would lead to increased ammonia deposition in natural areas vulnerable to ammonia. • Demand for reduction of ammonia emissions relative to production facility with lowest ammonia emission norm: 2007: 15%, 2008: 20%, 2009: 25% • Demands for injection of animal slurry on black soil and grass within buffer zones (1 km from vulnerable natural areas). • Demand for fixed cover on most new containers for solid manure and slurry tanks (depending on distance to neighbours and vulnerable natural areas). • Reduced number of Livestock Unit per hectare (LU/ha) when in nitrate vulnerable areas with low denitrification capacity • Regulation of phosphorous surplus on manure spreading areas	2007	2050	The Ministry of Food, Agriculture and Fisheries	NE	IE		Decarbonisation: GHG emissions and removals
56	70		7-AG-06: Biogas plants - reporting of annual mandatory leak detection and repair	Biogasanlæg - rapportering af årlig sporing af utætheder og udbedring	Single	NA	No /	5: Agriculture, 1: Energy supply	CH4	6_42: Improved animal waste management systems, 1_01: Increase in renewable energy sources in the electricity sector, 1_03: Switch to less carbon-intensive fuels	Not quantified	Regulatory	Related	4;2	Implemented	In 2019, a targeted effort to reduce methane emissions from Danish biogas plants was initiated. The findings from the project showed higher emissions than formerly assumed from the production of biogas. This resulted in the formulation of new regulation, which was put into effect January 1st 2023. The regulation dictates the reporting of annual mandatory leak detection and repair to the Danish Energy Agency, regular self-monitoring, as well as a 1 % limit on methane loss from upgrading facilities. It is expected that a new campaign to measure the effect of the regulation will take place in 2025.	2023	2050	The Danish Energy Agency	NA	IE		Decarbonisation: GHG emissions and removals
57	74		7-AG-13: Agreement on Nature (the Nature Package)	Naturpakken	Single	NA	Yes /	5: Agriculture, 6: LULUCF	CO2, CH4, N2O	6_41: Other activities improving cropland management	Not quantified	Regulatory	Related	4;2	Implemented	Political agreement aiming, amongst other goals, towards an increased protection of biodiversity. The agreement states initiatives within the following areas: Converting forests for biodiversity purpose, continued agreements for nature, nature and biodiversity, urban nature and outdoors recreation, open land management and the farmer's role as resource manager, modern nature conservation, and simplification of legislation.	2016	2050	The Ministry of Food, Agriculture and Fisheries	NE	IE		Decarbonisation: GHG emissions and removals
58	76		7-AG-15: Pool for the promotion of biogas and other green gases by tender	Pulje til fremme af biogas og andre grønne gasser ved udbud	Single	NA	Yes /	5: Agriculture, 1: Energy supply	CH4	6_42: Improved animal waste management systems, 1_01: Increase in renewable energy sources in the electricity sector, 1_02: Increase in renewable energy in the heating and cooling sector	Not quantified objective	Economic	Related	2	Adopted	The Climate Agreement introduces an aid scheme for the production of "biogas and other green gasses." According to the Climate agreement, the aid scheme will consist of six successive competitive bidding processes based on clear, transparent and non-discriminatory criteria, where producers of biogas and gasses based on renewable energy sources compete for the aid. The aid will be granted as operating aid for a period of 20 years in the form of a price premium in addition to the market price of the gas produced. The bids will be assessed based on the premium and the offered volume . Fully implemented in 2030 the scheme aims at reducing emmission by 0,7 mil. tonnes CO2e/yearly by producing 10 PJ biogas and e-methane.	2021	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals

(Table inserted as bookmark only – go to the database in Reportnet 3.0 to view the content.)

TABLE 4.21 MEASURES IN AGRICULTURE, FORESTRY AND FISHERIES (SEE ALSO TABLE 4.25 (LULUCF)) (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.					2020	2030		
59	77		7-AG-16: Separate nitrogen standards for humus soils	Særskilte kvælstofnormer for humusjorde	Single	NA	Yes /	5: Agriculture	N2O	6_41: Other activities improving cropland management	Not quantified objective	Regulatory	Related	2	Implemented	In 2020 a separate standard has been established for humus soils, which implies that nitrogen standard for crops and grass in rotation is reduced by 25 or 50 kg / N per hectare depending on crop type.	2020	2050	The Ministry of Food, Agriculture and Fisheries	NE	IE		Decarbonisation: GHG emissions and removals
60	78		7-AG-17: Adjustment of utilization requirements for livestock slurry and manure	Justering af udnyttelseskrav for husdyrgødning	Single	NA	Yes /	5: Agriculture	N2O	6_41: Other activities improving cropland management	Not quantified objective	Regulatory	Related	2	Implemented	In 2020 the utilization requirements in the DK Fertilizer Order has been adjusted, so that a larger share of the amount of nitrogen applied from livestock slurry and manure must count towards compliance with the farmers nitrogen quota.	2021	2050	The Ministry of Food, Agriculture and Fisheries	NE	IE		Decarbonisation: GHG emissions and removals
61	79		7-AG-18: Prohibition of fertilization and spraying, etc. on §3 areas (Protected areas)	Forbud mod gødskning og sprøjtning mv. på §3-arealer (Beskyttet natur)	Single	NA	Yes /	5: Agriculture	N2O	6_41: Other activities improving cropland management	Not quantified objective	Regulatory	Related	2	Adopted	In 2020 a ban of fertilization and spraying on §3 protected areas was adopted. The proposal aims to ensure that spraying, fertilizing and plowing no longer take place on a number of meadow areas with a total area of 37,000 hectares, which are covered by the Nature Conservation Act.	2022	2050	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
86	110		7-AG-19: Subsidy for biogas (for transport and processes)	110: Tilskud til biogas (til transport og proces) [KEFM PAM A]	Single	NA	Yes /	6: Agriculture, 1: Energy supply	CH4	6_42: Improved animal waste management systems	No quantified objective	Economic	Related	2	Adopted	The aid scheme for biogas towards transport and process was introduced with the Energy Agreement of 2012. In order to comply with the scheme requirements, biogas sold for direct use in the transport sector can not be produced from energy crops. Furthermore, recipients must live up to national and RED2 sustainability requirements and reporting obligations. As of January 1st 2020, the scheme was closed for new applicants and a production-based cap on potential aid was introduced. The aid scheme can go until 2032 and at least 20 years for the individual scheme recipients.	2012	2023	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals
87	113		7-AG-20: Subsidy for upgrading and purification of biogas	113: Tilskud til opgradering og rensning af biogas [KEFM PAM D]	Single	NA	Yes /	6: Agriculture, 1: Energy supply	CH4, CO2	6_42: Improved animal waste management systems	No quantified objective	Economic	Related	2	Adopted	The aid scheme for biogas towards upgrading and purification of biogas was introduced with the Energy Agreement of 2012. In order to comply with the scheme requirements, recipients must live up to national and RED2 sustainability requirements and reporting obligations. As of January 1st 2020, the scheme was closed for new applicants and a production-based cap on potential aid was introduced. The aid scheme can go until 2032 and at least 20 years for the individual scheme recipients.	2012	2023	The Danish Ministry of Climate, Energy and Utilities	NE	IE		Decarbonisation: GHG emissions and removals
96	134		7-AG-22: Ecological area support (Ecoscheme)	134: Økologisk arealstøtte (Ecoscheme) [FVM PAM C]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_45: Other agriculture.	No quantified objective	Economic	Related	2	Adopted	One-year scheme supporting both the conversion towards and maintenance of organic farming of agricultural land, in order to reach a doubling of the organic land in 2030.	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
97	135		7-AG-23: Environmentally and climate-friendly grass (Ecoscheme)	135: Miljø- og klimavenligt græs (Ecoscheme) [FVM PAM D]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_45: Other agriculture.	No quantified objective	Economic	Related	2	Adopted	One-year scheme supporting the postponement of ploughing of grasslands which achieves an environmental and climate effect on the individual area. Furthermore, it contributes to improved microbiology and soil fertility.	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
99	137		7-AG-24: Plants (Ecoscheme)	137: Planter (Ecoscheme) [FVM PAM F]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_45: Other agriculture.	No quantified objective	Economic	Related	2	Adopted	One-year scheme promoting greater crop diversity in agriculture by supporting increased crop diversification and the cultivation of rotational crops (mainly used for food and protein crops).	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
100	138		7-AG-25: Biodiversity and sustainability (Ecoscheme)	138: Biodiversitet og bæredygtighed (Ecoscheme) [FVM PAM G]	Single	NA	No /	6: Agriculture, 7: LULUCF	N2O, CH4, CO2	6_45: Other agriculture. , 7_56: Other land use, land-use change and forestry	No quantified objective	Economic	Related	2	Adopted	One-year scheme supporting the laying out of non-productive agricultural areas to provide more habitats for animals and plants. The subsidy builds on the GLMB requirement of at least 4 per cent. non-productive areas on arable lands.	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals

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TABLE 4.21 MEASURES IN AGRICULTURE, FORESTRY AND FISHERIES (SEE ALSO TABLE 4.25 (LULUCF)) (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implementation	Brief description	Start year of implementation	End year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mld			- in national language									Related ?	No.					2020	2030		
101	139		7-AG-26: Implementation of "targeted regulation"	139: Gennemførsel af målrettet regulering [FVM PAM G]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_39: Reduction of fertilizer/manure use on cropland, 6_40: Improved livestock management, 6_41: Other activities improving cropland management, 6_42: Improved animal waste management systems, 6_43: Activities improving grazing land or grassland management, 6_44: Improved management of organic soils	No quantified objective	Economic	Related	2	Adopted	The "targeted regulation" is a two-part regulatory scheme related to the objectives of the Water Framework Directive; a voluntary subsidy scheme focused on the reduction of nitrate leaching from agricultural soils through the use of a variety of measures, and - in the event of a lack of voluntary effort - a requirement to establish the measures without compensation will be imposed. The nitrate reducing measures will cause derivative effects on greenhousegas emissions. This encompasses reductions of indirect nitrous oxide emissions and increase of carbon sequestration in soil.	2022	2025	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
102	140		7-AG-27: Restoration of phosphorous wetlands	140: Fosfor-vådområder [FVM PAM I]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_45: Other agriculture.	No quantified objective	Economic	Related	2	Adopted	The purpose of the scheme is to reduce phosphorus emmission to water bodies. The projects must be located in sub-areas with at detected need for action, cf. the danish water plans.	2022	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
103	142		7-AG-28: Environmental and climate technology	142: Miljø- og klimateknologi [FVM PAM K]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_45: Other agriculture.	No quantified objective	Economic	Related	2	Adopted	Subsidy for investment in environmentally and climate-friendly technologies on the farm.	2022	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
104	144		7-AG-29: Organic investment support	144: Økologisk investeringsstøtte [FVM PAM M]	Single	NA	No /	6: Agriculture	N2O, CH4, CO2	6_45: Other agriculture.	No quantified objective	Economic	Related	2	Adopted	Subsidies for investments in new technologies, in order to improve the competitiveness of organic farming, strengthen efforts to improve the climate, and contribute to the national effort to double the organic area.	2022	2023	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
105	145		7-AG-30: Collective actions measures to reduce nitrogen emissions	145: Kollektive kvælstofvirkemidler: kvælstofvådområder, minivådområder, skovrejsning og løvbundsprojekter [FVM PAM N]	Single	NA	No /	6: Agriculture, 7: LULUCF	N2O, CH4, CO2	6_44: Improved management of organic soils, 7_54: Prevention of drainage or rewetting of wetlands	No quantified objective	Economic	Related	2	Adopted	Consists of four voluntary subsidy schemes that contribute to reducing nitrogen emissions into Danish waters (restoration of nitrogen wetlands, restoration of mini-wetlands, afforestation and restoration of peatland).	2022	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
118	159		7-AG-31: General reduction requirement for cattle	Generelt reduktionskrav for kvæg	Single	NA	No /	6: Agriculture	CH4	6_40: Improved livestock management	No quantified objective	Other (Voluntary/negotiated agreements), Information, Regulatory	Non related	2	Adopted	Reduction of greenhouse gas emissions (methane) from cattle via increased fat in cattle feed or use of new measures such as feed additives, e.g. Bovaer.	2021	2050	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
119	160		7-AG-32: More frequent discharge of pig manure	Hyppigere udslusning af svinegylle	Single	NA	No /	6: Agriculture	CH4	6_40: Improved livestock management	No quantified objective	Other (Voluntary/negotiated agreements), Information, Regulatory	Non related	2	Adopted	Reduction of greenhouse gas emissions from pig manure via requirements for more frequent discharge of manure from pig barns to an outdoor cooler storage or biogas plant, which reduces emissions.	2021	2050	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
122	163		7-AG-33: CAP-law	CAP-lov	Single	NA	No /	6: Agriculture	CH4, N2O	6_40: Improved livestock management, 6_41: Other activities improving cropland management, 6_42: Improved animal waste management systems	No quantified objective	Other (Voluntary/negotiated agreements), Information, Regulatory	Related	33	Adopted	Authorization Act that brings together existing legislation and implements EU's agricultural policy from 2023. In the act, authorization is given to determine basic requirements and establish eco-schemes.	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
123	164		7-AG-34: Implementation of EU's agricultural policy	Implementering af EU's landbrugspolitik	Single	NA	No /	6: Agriculture	CH4, N2O	6_40: Improved livestock management, 6_41: Other activities improving cropland management, 6_42: Improved animal waste management systems	No quantified objective	Other (Voluntary/negotiated agreements), Information, Regulatory, Economic	Related	33	Adopted	Implementation of the overall milestones in the Danish strategic CAP plan. The strategic CAP plan was submitted to the Commission in December 2021 and approved by the Commision on 31 August 2022.	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
124	165		7-AG-35: Conditionality (GLM-requirements)	Konditionalitet (GLM-krav)	Single	NA	No /	6: Agriculture	CH4, N2O	6_40: Improved livestock management, 6_41: Other activities improving cropland management, 6_42: Improved animal waste management systems	No quantified objective	Economic	Related	33	Adopted	Good agricultural and environmental conditions (GLM) are the basic requirements (baseline) that a farmer must meet in order not to get his agricultural support received from pillar I reduced as well as area payments from pillar II. The requirements apply from 2023.	2023	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals

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TABLE 4.21 MEASURES IN AGRICULTURE, FORESTRY AND FISHERIES (SEE ALSO TABLE 4.25 (LULUCF)) (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action - in national language	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Parnid												Related ?	No.						2020	2030		
56	70		7-AG-06: Biogas plants - reporting of annual mandatory leak detection and repair	Biogasanlæg - rapportering af årlig sporing af utætheder og udbedring	Single	NA	No / Yes	5: Agriculture, 1: Energy supply	CH4	6_42: Improved animal waste management systems, 1_01: Increase in renewable energy sources in the electricity sector, 1_03: Switch to less carbon-intensive fuels	Not quantified	Regulatory	Related	4;2	Implemented	In 2019, a targeted effort to reduce methane emissions from Danish biogas plants was initiated. The findings from the project showed higher emissions than formerly assumed from the production of biogas. This resulted in the formulation of new regulation, which was put into effect January 1st 2023. The regulation dictates the reporting of annual mandatory leak detection and repair to the Danish Energy Agency, regular self monitoring, as well as a 1 % limit on methane loss from upgrading facilities. It is expected that a new campaign to measure the effect of the regulation will take place in 2025.	2023	2050	The Danish Energy Agency	NA	IE		Decarbonisation: GHG emissions and removals
58	76		7-AG-15: Pool for the promotion of biogas and other green gases by tender	Pulje til fremme af biogas og andre grønne gasser ved udbud	Single	NA	Yes / Yes	5: Agriculture, 1: Energy supply	CH4	6_42: Improved animal waste management systems, 1_01: Increase in renewable energy sources in the electricity sector, 1_02: Increase in renewable energy in the heating and cooling sector	Not quantified objective	Economic	Related	2	Adopted	The Climate Agreement introduces an aid scheme for the production of "biogas and other green gasses." According to the Climate agreement, the aid scheme will consist of six successive competitive bidding processes based on clear, transparent and non-discriminatory criteria, where producers of biogas and gasses based on renewable energy sources compete for the aid. The aid will be granted as operating aid for a period of 20 years in the form of a price premium in addition to the market price of the gas produced. The bids will be assessed based on the premium and the offered volume . Fully implemented in 2030 the scheme aims at reducing emmission by 0,7 mil. tonnes CO2e/yearly by producing 10 PJ biogas and e-methane.	2024 (expected)	2050	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals
86	110		7-AG-19: Subsidy for biogas (for transport and processes)	110: Tilskud til biogas (til transport og proces) [KEFM PAM A]	Single	NA	Yes / Yes	6: Agriculture, 1: Energy supply	CH4	6_42: Improved animal waste management systems	No quantified objective	Economic	Related	2	Implemented	The aid scheme for biogas towards transport and process was introduced with the Energy Agreement of 2012. In order to comply with the scheme requirements, biogas sold for direct use in the transport sector can not be produced from energy crops. Furthermore, recipients must live up to national and RED2 sustainability requirements and reporting obligations. As of January 1st 2020, the scheme was closed for new applicants and a production-based cap on potential aid was introduced. The aid scheme can go until 2032 and at least 20 years for the individual scheme recipients.	2012	2022 (the subsidy expires from 2032-2042)	The Danish Ministry of Climate, Energy and Utilities	NA	IE		Decarbonisation: GHG emissions and removals
87	113		7-AG-20: Subsidy for upgrading and purification of biogas	113: Tilskud til opgradering og rensning af biogas [KEFM PAM D]	Single	NA	Yes / Yes	6: Agriculture, 1: Energy supply	CH4, CO2	6_42: Improved animal waste management systems	No quantified objective	Economic	Related	2	Implemented	The aid scheme for biogas towards upgrading and purification of biogas was introduced with the Energy Agreement of 2012. In order to comply with the scheme requirements, recipients must live up to national and RED2 sustainability requirements and reporting obligations. As of January 1st 2020, the scheme was closed for new applicants and a production-based cap on potential aid was introduced. The aid scheme can go until 2032 and at least 20 years for the individual scheme recipients.	2012	2022 (the subsidy expires from 2032-2042)	The Danish Ministry of Climate, Energy and Utilities	NE	IE		Decarbonisation: GHG emissions and removals

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* Here "Yes" means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.8 LULUCF (Land-Use, Land-Use Change and Forestry)

4.3.8.1 CO_2, CH_4 and N_2O – emissions and removals in LULUCF under the Climate Convention

The emission of GHGs from the LULUCF sector (Land Use, Land Use Change and Forestry) includes primarily the emission of CO_2 from land use and small amounts of N_2O from disturbance of soils not included in the agricultural sector.

The LULUCF sector is subdivided into six major categories:

- Forest
- Cropland
- Grassland
- Wetlands
- Settlements
- Other Land

Forests and forestry are important due to CO_2 sequestration and emissions as a consequence of trees growing, respiring and decomposing. Danish forests contain a considerable store of CO_2 absorbed from the atmosphere. When new forests are established, new CO_2 stores are created. Afforestation is therefore a useful climate policy instrument.

The total sector has been estimated to be a net source in most years in the period 1990-2022 – except in 2015 and 2022 – with a declining trend towards net zero emissions, especially since 2007.

Under this trend, net emissions/removals from the sector also fluctuate based on specific conditions in the given year. In general, the forest sector is a net sink or around in its equilibrium state, while Cropland and Grassland are net sources. The latter due to a large area with drained organic soils.

Forest has shown to be a sink for all years since 1990. In 2022, forest has been estimated to be a net sink of 3352 kt CO_2 equivalents. In 2022, Cropland has been estimated to be a net source of 616 kt CO_2 equivalents. Grassland was an even bigger net source in 2022, where emissions were estimated at 1966 kt CO_2 equivalents due to a large area with drained organic soils. Emissions from Cropland and Grassland have shown a continuous decrease since 1990. However, large variations occur between years as shown in Table 4.22.

TABLE 4.22 TOTAL GREENHOUSE GAS EMISSIONS IN THE LULUCF SECTOR FROM THE BASE YEAR 1990 TO THE LATEST REPORTED YEAR 2022.
Source: Nielsen at al. (2024a) - Denmark's National Inventory Report 2024 and CRF for 1990-2022.

Total greenhouse gas emissions*	Base year	1990	1995	2000	2005	2010	2015	2019	2020	2021	2022	Change from base to latest reported year
	(kt CO_2 eq)											%
4. Land use, land-use change and forestry	6694	6694	5317	5087	4971	2361	-95	1531	1292	198	-381	-106
A. Forest land	-1201	-1201	-1209	-1253	-878	-2185	-3979	-2408	-2104	-2867	-3352	179
B. Cropland	5009	5009	3928	3808	3348	2336	1468	1678	1187	626	616	-88
C. Grassland	2335	2335	2217	2099	2001	1885	2111	2016	1995	2068	1966	-16
D. Wetlands	102	102	76	76	98	81	79	107	125	135	142	39
E. Settlements	451	451	422	331	288	269	399	222	207	292	345	-24
F. Other land	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
G. Harvested wood products	-2	-2	-116	26	113	-25	-172	-85	-118	-56	-98	4037
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0

* In this table, the signs for removals in kt CO_2 eq. are negative (-) and for emissions in kt CO_2 eq. positive (+). In the column showing percentage changes, the signs for decrease in emissions or removals are negative (-) and for increase in emissions or removals positive (+).

Forest policies

For more than 30 years climate change has been mitigated through long-term goals and measures for increased forest cover in Denmark.

In 1989, a legislative proposal for a new Danish forest act referred to a long-term goal of doubling the Danish forest cover to approximately 25 pct. of the land area in the course of a tree generation.

In 2002, the first Danish National Forest Programme set out the long-term objective that forest landscapes should cover 20-25 pct. of Denmark in the course of 80-100 years. These objectives and measures relates to Article 3.3 of the Kyoto Protocol. Various measures have been taken towards achieving the goals as shown in Table 4.25. For instance, a government grant scheme has been established as an incentive for afforestation on private agricultural land. Also, the state itself is establishing new forests, and some private individuals are establishing forests on agricultural land without a government grant. Through rural planning and differentiated incentives, afforestation is particularly encouraged in certain priority areas in order to pursue multiple forest functions and values, implementing the water framework directive and including recreation and ground water protection.

In October 2018, the Danish Ministry for Environment and Food launched a new National Forest Programme. It sat out a long-term vision and two long term goals related to expansion of forest cover and biodiversity conservation, 13 strategic orientation lines as well as a number of concrete actions for a multifunctional and sustainable development of Danish forests.

The programme includes a vision for a forest area in growth with healthy and robust forests, which accommodate diversity and provide good opportunities for sustainable timber production and the creation of jobs. The forests should also provide good opportunities for biodiversity, preservation of natural treasures, mitigation of climate

change, groundwater protection and offer great outdoor experiences - in new and old forests and for the benefit of both present and future generations.

The programme's long-term goal for forest cover builds on the goal established in the national forest programme of 2002 and reads: “Before the end of the 21st century, forested landscapes will cover 20-25 pct. of Denmark's total area”. Thus, the goal relates to “forest landscapes”, which constitutes all forests and some surrounding areas as well. However, a precise definition of forest landscapes has not yet been developed. The Danish forest area is currently 14.9 pct. of the land cover.

Many strategic orientation lines relate to climate and energy, most notably those below.

Under the header “More forest and less global warming”:

- Increase the Danish forest area and increase the public utility of the new forests.
- Increase the uptake and stocks of carbon in forests and wood products through sustainable management.

Under the header “Sustainable production”:

- A favourable and clear framework for sustainable production of timber and other goods.
- Increase the demand and supply of documentable sustainable timber.
- Uniform, robust and operational criteria for "sustainable timber".
- Continue the conversion and development of close to nature forestry.

As part of the Common Agricultural Policy Reform 2022-2027, DKK 600 million has been allocated to afforestation. The scheme is expected to contribute to climate change mitigation by reducing greenhouse gas emission and enhancing carbon sequestration, as well as promoting sustainable energy. The scheme is a continuation of the afforestation support scheme in the Rural Development Programme 2014-2020.

In 2022, the government announced in its government platform that it will present an ambitious forest plan for the establishment of 250.000 hectares of new forest in Denmark. Establishment of new forests will contribute to reaching climate neutrality and, in time, net negative emissions. The forest plan shall ensure the greatest possible synergy and balance between the many purposes for new forests and identify key partners and already existing funds as well as consider appropriate means of implementation. This must be done in parallel with the preparation of a vision plan for agricultural development. Financial contributions to the forest plan and afforestation will be provided through a newly established green Danish fund and from private actors. In 2024, the government and a coalition of parties in parliament agreed to allocate DKK 625 million for afforestation. The environmental- and climate effects depend among other things on the type of forest that is planted, and the government and the agreement parties will now look into how the funds will be allocated.

Harvested wood products (HWP)

Carbon net emissions from harvested wood products (HWP) have been reported since 2013. Denmark has chosen to report under Approach B, the production approach, which refers to equations 12.1, 12.3 and 12.A.6 of volume 4 of the 2006 IPCC Guidelines and the 2013 Supplementary GPG.

The HWP estimation for 2022 is shown in Table 4.23.

TABLE 4.23. HWP IN USE FROM DOMESTIC HARVEST IN 2022 (CRF TABLE 4.GS1).
Source: Nielsen at al. (2024a) - Denmark's National Inventory; March 2024 and CRF for 1990-2022.

	HWP in use from domestic harvest				Net emissions/ removals from HWP in use
	Gains	Losses	Half-life	Annual Change in stock (ΔC HWP IU DH)	
	(t C)		(yr)	(kt C)	(kt CO_2)
HWP produced and consumed domestically (ΔC HWPdom IU DH)					
Total	**150,062**	**-118,933**		**31**	**-114**
1. Solid wood	150,062	-118,928		31	-114
Sawn wood	42,095	-64,841	35	-23	83
Wood panels	107,967	-54,087	25	54	-198
2. Paper and paperboard	IE	-6	2	0	0
HWP produced and exported					
Total	**25,807**	**-30,238**		**-4**	**16**
1. Solid wood	25,807	-30,228		-4	16
Sawn wood	6,002	-11,834	35	-6	21
Wood panels	19,805	-18,394	25	1	-5
2. Paper and paperboard	NA	-10	2	0	0

Cropland and Grazing land

For agriculture, the following potential sources of CO_2 emissions and CO_2 sequestration have been included:

1. Net change in the content of carbon in mineral soils in connection with changed land use and cultivation.
2. Net change in the soil's carbon stock in connection with drainage and cultivation of organic soils or re-establishment of wetlands.
3. Change in the carbon content of wood biomass in wind breaks and fruit farms.

One of the measures with an effect on return of carbon to the soil has been the ban on burning of straw residues on fields as shown in Table 4.25.

The ban has resulted in greater return of carbon to the soil, and therefore increased carbon storage in the soil, as well as increased use of straw as a fuel. Both uses will result in a net reduction in CO_2 emissions. Not burning straw prevents the methane and nitrous oxide emissions associated with the burning. On the other hand, there are some emissions of nitrous oxide in connection with the return of nitrogen to the soil when the straw is mulched.

The measure works by regulating behaviour, and the ban was introduced from 1990. The measure was implemented in the form of a statutory order under the Environmental Protection Act. Ban on field burning is a part of cross compliance under EUs Common Agricultural Policy.

Requirements to grow catch crops in the autumn to reduce nitrate leaching also leads to CO_2 sequestration. In 2022, the area with catch crops constituted approximately 530,000 hectares or approximately 20% of the agricultural area.

Another measure which will increase sequestration in woody biomass is the planting of windbreaks also mentioned in Table 4.25. The objective of planting windbreaks

has primarily been to reduce wind erosion and ensure greater biodiversity. Planting of windbreaks has been supported under conditions described in the Statutory Order on Subsidies for Planting Windbreaks and Biotope-improving Measures (Statutory Order no. 1101 of 12/12/2002). Support has been granted under the EU Rural Districts Programme. For the period 2017-2019 windbreaks were established under the political agreement of May 2016 called "Naturpakken" where greater biodiversity was the main objective. Since the end of the 1960s about 1,000 km of tree-lined windbreaks have been planted with government subsidies. It is also estimated that about 30% more has been planted without subsidies. Estimates indicate that planting of windbreaks leads to CO_2 sequestration in woody biomass of about 130,000 tonnes CO_2/year[16].

The Danish CAP Strategic Plan (2023-27) also provides support for measures that may increase carbon sequestration in the soil, such as maintenance of grass land, catch crops, intermediate crops, early sowing of winter crops, fallow land and perennial energy crops.

In Table 4.25 an overview of implemented and adopted relevant policies and measures in LULUCF sector is shown.

[16] Gyldenkærne et al, 2005: Gyldenkærne, S., Münier, B., Olesen, J.E., Olesen, S.E., Petersen, B.M. & Christensen, B.T. (2005). Opgørelse af CO_2-emissioner fra arealanvendelse og ændringer i arealanvendelse. Arbejdsrapport fra DMU.

TABLE 4.25 MEASURES IN THE LAND-USE, LAND-USE CHANGE AND FORESTRY SECTOR (LULUCF)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implementation	Brief description	Start year of implementation	End year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mid			- in national language									Related ?	No.					2020	2030		
62	80	Table 4.25	8-LU-01: Ban on burning straw on fields	Forbud mod halmafbrænding på marker	Single	NA	Yes /	7: LULUCF, 6: Agriculture	CO2	7_55: Restoration of degraded lands, 6_44: Improved management of organic soils	No quantified objective	Economic	Related	4;2	Implemented	One of the measures with an effect on return of carbon to the soil has been the ban on burning of straw residues on fields. The ban has resulted in greater return of carbon to the soil, and therefore increased carbon storage in the soil, as well as increased use of straw as a fuel. Both uses will result in a net reduction in CO2 emissions. Not burning straw prevents the methane and nitrous oxide emissions associated with the burning. On the other hand, there are some emissions of nitrous oxide in connection with the return of nitrogen to the soil when the straw is mulched. The measure works by regulating behaviour, and the ban was introduced from 1990. The measure was implemented in the form of a statutory order under the Environmental Protection Act, and compliance is monitored by the local authorities. The objectives are conservation of carbon in agricultural soils and reduction of air pollution.	1989	2050	The Ministry of Food, Agriculture and Fisheries	NE	IE		Decarbonisation: GHG emissions and removals
63	82		8-LU-04: Public afforestation (state and municipalities)	Statslig skovrejsning	Single	NA	Yes /	7: LULUCF	CO2	7_46: Afforestation and reforestation	No quantified objective	Regulatory, Other (Voluntary/negotiated agreements)	Related	4;2	Implemented	The majority of new public forests are stateowned. The purpose of new state forests is to establish resilient and multifunctional forests, e.g. recreational nature close to cities/users, groundwater protection, carbon storage, nutrient reduction and support biodiversity in generel. The projects are etablished as a collaboration between state, municipalities and (often) waterworks - who each contributes financially. The Danish Nature Agency etablish approximately 300 hectares each year. On-going implementation through annual budgets.	1989	2050	Ministry of Environment of Denmark	NE	IE		Decarbonisation: GHG emissions and removals
64	86		8-LU-08: Establishment of the Danish Climate Forest Fund to support climate efforts	Oprettelse af Den Danske Klimaskovfond mhp understøttelse af klimaindsatsen	Single	NA	Yes /	7: LULUCF, 6: Agriculture	CO2, N2O	7_46: Afforestation and reforestation, 6_44: Improved management of organic soils, 7_55: Restoration of degraded lands	No quantified objective	Economic	Related	2;40	Implemented	The Danish Climate Forest Fund is an independent, governmental administrative unit under the Danish Ministry of the Environment. The fund was adopted by Danish law in 2020 and established in 2021. The purpose of the fund is to support the Danish climate policy by cost-efficiently enhancing carbon removal by afforestation as well as by reestablishment of wetlands on organic soils funded by donations from private companies, funds, citizens and government departments.	2021	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals
95	133		8-LU-11: Subsidy for restoration of peatland (CAP+national)	133: Lavbundsprojekter, klima-lavbundsprojekter (CAP+national) [FVM PAM B]	Single	NA	No /	7: LULUCF, 6: Agriculture	CO2	7_54: Prevention of drainage or rewetting of wetlands, 7_56: Other land use, land-use change and forestry, 6_44: Improved management of organic soils	No quantified objective	Economic	Related	2	Adopted	Reduction of greenhouse gas emissions from carbon-rich low-lying soils by reverting the soils, herreafter the natural water level will be restored and the wetlands reestablished - which reduces CO2 emissions.	2020	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
98	136		8-LU-12: Extensification of carbon rich soils (Ecoscheme)	136: Ekstensivering med slæt [FVM PAM E]	Single	NA	No /	7: LULUCF, 6: Agriculture	N2O, CH4, CO2	7_56: Other land use, land-use change and forestry, 6_44: Improved management of organic soils	No quantified objective	Economic	Related	2	Adopted	Promotion of an extensive use of carbon-rich peat soils or associated areas by removing biomass and enforcing a ban on fertilization. Thereby preparing the soils for a possible later rewetting.	2022	2024	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
120	161		8-LU-13: Private afforestation	Privat skovrejsning	Single	NA	Yes /	7: LULUCF, 6: Agriculture	CO2, N2O	6_44: Improved management of organic soils, 7_46: Afforestation and reforestation	No quantified objective	Economic	Related	33;35	Adopted	The scheme support afforestation on agricultural areas owned by private parties or municipialities. The scheme aims at reducing nitrogene leakage in water bodies and contributes in reducing CO2 emissions.	2022	2027	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals
			Permanent extensification	Permanent ekstensivering	Single	NA	No	7: LULUCF, 6: Agriculture	N2O, CH4, CO2	7_56: Other land use, land-use change and forestry, 6_44: Improved management of organic soils	No quantified objective	Economic			Adopted	Comensation for permanent extensification of agrisultural land (all types of land) and enforcing a ban on fertilization. Thereby preparing the soils for a possible later rewetting and nature restoration.	2025	2025	The Ministry of Food, Agriculture and Fisheries	NA	IE		
121	162		8-LU-14: Temporary reduction in logging	Midlertidig reduktion i hugst	Single	NA	Yes /	7: LULUCF, 6: Agriculture	CO2	7_47: Conservation of carbon in existing forests	No quantified objective	Regulatory	Related	40	Adopted	Temporary reduced harvesting in state owned forest during 2026 to 2031.	2022	2031	The Ministry of Food, Agriculture and Fisheries	NA	IE		Decarbonisation: GHG emissions and removals

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* Here “Yes” means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.
** See explanatory note under Table 4.26.

4.3.9 Waste

Emissions of greenhouse gases from waste originate from either the general waste sector, or the wastewater treatment sector, with the general waste sector being the most dominant contributor.

The direct contribution of the waste sector (excluding incineration of waste) to greenhouse gas emissions consists primarily of methane from the decomposition of biogenic waste. Out of the total greenhouse gas emissions from the waste sector of 1.2 million tonnes CO_2 equivalents in 2022 – corresponding to 2.9 pct. of total Danish greenhouse gas emissions – the proportion from landfills was 34 pct., from compost production 10 pct., from wastewater treatment 17 pct., from biogas plants 37 pct. and 2 pct. from other minor sources such as accidental fires. Greenhouse gas emissions from wastewater treatment included both methane (40 pct.) and nitrous oxide (60 pct.) in 2022.

In 2012, Denmark produced approximately 10.3 mio. tonnes of waste. About 65 pct. was utilized through material recovery, 31 pct. was incinerated, and 4 pct. ended up in a landfill. In 2021, the total amount of waste produced in Denmark increased to 12.4 mio. tonnes, of which 74 pct. was utilized through material recovery, 23 pct. was incinerated, and 4 pct. was landfilled. Both the amount of waste incinerated and deposited has decreased and the material recovery was increased.

Table 4.26 shows the climate relevant measures implemented in the waste sector.

4.3.9.1 CH_4 (methane) and N_2O (nitrous oxide) emissions from biowaste and landfills

Biowaste

Biowaste, which consists of food and garden waste, produces methane and nitrous oxide as it decomposes, both potent greenhouse gasses contributing to global warming. In recent years, Denmark has implemented separate sorting and collection of biowaste nationally. The Danish EPA is currently investigating the best practice for handling garden waste in order to reduce GHG emissions.

Landfills

Denmark has long been one of the frontrunners for reducing the amount of waste landfilled. This includes a regulatory ban on landfilling of incinerable waste and taxes on landfilling. The level of landfilled waste in Denmark is significantly lower than the current EU average and lower than 10 pct. landfilled waste target for 2035 as defined in the Landfill Directive. Despite the low landfilling rate in Denmark, efforts to reduce methane emissions from landfills are ongoing. The Technical University of Denmark has established a viable methodology for documentation of greenhouse gas emissions reductions achieved through the installation of a bio-cover system on landfills. Furthermore, methane generated from waste in some Danish landfills gets collected (to the extent possible) in dedicated gas collection systems and is used for energy generation. A reduction in methane emissions to the atmosphere is thereby achieved.

4.3.9.2 CH_4 (methane) and N_2O (nitrous oxide) emissions from wastewater

Wastewater

The Danish wastewater treatment sector was responsible for 143.499 tons of CO_2e emissions in 2022. The main contribution from the sector is related to the nitrous oxide emissions from the treatment process, which accounts for 68 pct. of GHG emissions from the entire sector. In 2020 it was politically agreed to introduce limit values for nitrous oxide in the sector. The Danish Environmental Protection Agency is in the process of establishing the knowledge basis on which the limit values for the GHG-emissions from wastewater will be established. The emissions from wastewater treatment can be reduced by covering the treatment plants and adjusting and controlling wastewater treatment. Minor contribution to GHG-emissions from the wastewater sector originates from methane emissions from private septic tanks and nitrous oxide emissions from surface water or peripheral sectors such as aquaculture.

TABLE 4.26 MEASURES IN THE WASTE SECTOR

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.					2020	2030		
65	88	Table 4.26	9-WA-01: A ban of landfill of combustible waste.	Anvisning af forbrændingsegnet affald til forbrænding (de facto forbud mod deponering af forbrændingsegnet affald)	Single	NA	Yes / Yes	5: Waste management/ waste	CH4	5_35: Waste incineration with energy use, 5_37: Reduced landfilling	No quantified objective	Regulatory	Related	4;2	Implemented	In 1996 the Statutory Order on Waste was amended to introduce an obligation for municipalities to assign combustible waste to incineration (corresponding to a stop for disposal of combustible waste at landfills) from 1 January 1997. As a result of this, large quantities of combustible waste that used to be disposed of at landfills are now either recycled or used as fuel in Danish incineration plants.	1997	2050	Municipalities	NE	IE		Decarbonisation: GHG emissions and removals
66	89		9-WA-02: The waste tax	Affalds- og råstofafgiftsloven	Single	NA	Yes / Yes	5: Waste management/ waste	CH4	5_37: Reduced landfilling	No quantified objective	Economic, Fiscal	Related	4;2	Implemented	A tax is imposed on waste for incineration or landfilling. The taxes are DKK 475 per tonne for landfilling and DKK 60,9/GJ for incineration.	1987	2050	Danish Ministry of Taxation	NE	IE	Link to legislation: https://www.retsinformation.dk/eli/lta/2020/503 (and https://www.retsinformation.dk/eli/lta/2020/2061 ?)	Decarbonisation: GHG emissions and removals
67	90		9-WA-03: Weight-and-volume-based packaging taxes	Vægt- og volumen-baserede emballage-afgifter	Single	NA	Yes / Yes	5: Waste management/ waste	CO2, CH4	5_30: Demand management/reduction	No quantified objective	Economic, Fiscal	Related	4;2	Implemented	Weight-and-volume-based taxes (e.g. on various packaging, carrier bags and PVC film) encourage a reduction in packaging consumption and thus the quantities of waste. The weight-based tax is based on an index that reflects the environmental burden of the materials used.	2014	2050	Danish Ministry of Taxation	NE	IE		Decarbonisation: GHG emissions and removals
68	92		9-WA-06: Implementation of the EU landfill directive	Implementering af EU's lossepladsdirektiv	Single	NA	Yes / Yes	5: Waste management/ waste	CH4	5_34: Improved landfill management	No quantified objective	Regulatory	Related	39	Implemented	On the basis of the EU Landfill Directive, demands on the establishment and operation of landfills in Denmark have been tightened with Statutory Orders No. 650 of 29 June 2001, No. 252 of 31 March 2009, No. 719 of 24 June 2011 and No. 1049 of 28th of August 2013 on landfills. According to the Statutory Orders on landfills, methane in landfills for mixed waste must be monitored. From landfills where significant amounts of biodegradable waste are disposed of, methane gas must be managed in an environmentally-sound way.	1999	2050	The Environmental Protection Agency	NE	IE		Decarbonisation: GHG emissions and removals
69	93		9-WA-09: Subsidy programme for biocovers on landfills	Støtte til biocovers på gamle lossepladser	Single	NA	Yes / Yes	5: Waste management/ waste	CH4	5_34: Improved landfill management	No quantified objective	Economic	Related	4;2	Implemented	Biocovers is a technique that uses compost as a cover on landfills. The microorganisms in the compost increases the oxidation of methane in the top layer.	2017	2050	The Environmental Protection Agency	NE	IE		Decarbonisation: GHG emissions and removals
70	94		9-WA-10: Prohibition of free plastic bags and thin plastic bags	Forbud mod gratis plastikposer og tynde plastikposer	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Implemented	As of 1 January 2021, the following carrier bags may not be handed out free of charge at points of sale for goods or products: - Plastic carrier bags with a handle that is thicker than 30 micrometers (eg ordinary carrier bags in supermarkets) - Plastic carrier bags without a handle that are thicker than 30 micrometers - Carrying bags with handles of materials other than plastic In addition, plastic bags thinner than 30 micrometers are completely prohibited. Plastic bags thinner than 15 micrometers with no handle are excempted from the ban.	2021	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals

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TABLE 4.26 MEASURES IN THE WASTE SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implementation	Brief description	Start year of implementation	End year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.						2020	2030		
71	95		9-WA-11: Triple the tax on carrier bags and disposable tableware	Tredobling af afgiften på bæreposer og engangsservice	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Economic, Fiscal	Related	2	Implemented	The tax on carrier bags and disposable tableware was trippled as of January 2020 with the aim of reducing consumption and waste.	2020	2050	Danish Ministry of Taxation	NE	IE	The action has been implemented, and the effect will appear in the historical data.	Decarbonisation: GHG emissions and removals
72	96		9-WA-12: Requirements for the possibility of direct reuse at municipal recycling stations	Krav om mulighed for direkte genbrug på kommunale genbrugsstationer	Single	NA	Yes / No	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	All municipal recycling stations are obliged to make a designated spot available where citizens can hand in objects with the purpose of direct reuse of the objects. The objects should be made available first to private agents such as voluntary organisations and citizens.	[2023 /2024]	2050	Ministry of Environment of Denmark	NA	IE	The action has been abandoned	Decarbonisation: GHG emissions and removals
73	97		9-WA-13: Streamlining the sorting of business household-like waste	Strømlining af sortering og indsamling af erhvervslivets husholdningslignende affald	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	The guidelines and criteria for the sorting of household-like waste from businesses are streamlined nationally and made mandatory and follows the sorting criteria for households for 10 wastefractions. The national wastepictograms for the 10 wastefraction of householdwaste must be used on the collectionbins (the bins collected by the wastecollector). The national guidelines, including the usage of waste pictograms, have been implemented in 2022.	2022	2050	Ministry of Environment of Denmark	NA	IE	The effect of this action has been adhusted down for KF24.	Decarbonisation: GHG emissions and removals
74	98		9-WA-14: Streamlining and mandatory collection schemes for household waste	Strømlining og obligatoriske henteordninger for husholdningernes affald	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	The guidelines and criteria for the sorting and collecting of household waste are streamlined nationally and made mandatory. The national wastepictograms for the 10 wastefraction of householdwaste must be used on the collectionbins (the bins collected by the wastecollector). The national guidelines, including the usage of waste pictograms, must be imlemented and followed across all municipalities. For the following waste fractions separate collection are made mandatory: Food, paper, cardboard, metal, glass, plastic, textiles (as of 2023), carton packaging from food and drink, hazardouz waste, and general waste. There are possibility for combined collection of some fraction e.g. paper/cardboard, plastic/foodcartons and plastic/foodcartons/metal.	2021	2050	Ministry of Environment of Denmark	NA	IE	The effect of this action has been adhusted down for KF24.	Decarbonisation: GHG emissions and removals
75	99		9-WA-15: Streamlining with mandatory collection scheme for household textile waste	Strømlining med obligatorisk henteordning for husholdningernes tekstilaffald	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	As of 2023, it has been mandatory for the municipalities to include textile waste as a seperate waste fraction in the provided waste collections scheme. Regarding the implementation of the waste collection of textile waste it is important that voluntary organisations have easy access to textiles able to be reused.	2023	2050	Ministry of Environment of Denmark	NA	IE	The effect of this action has been adhusted down for KF24.	Decarbonisation: GHG emissions and removals
76	100		9-WA-16: Waste sorting in the public space	Affaldssortering i det offentlige rum	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	Waste sorting in the public space will be improved, especially in the public spaces with most people and most waste. A scheme for the collection of plastic waste in the public space will be implemented. The new and improved sorting and collection of waste in public areas will be implemented together with PPWR-initiatives on wast sorting medio 2026. It will be analyzed whether or not part of the waste managing in public spaces can be funded through waste fees.	2026	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals

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TABLE 4.26 MEASURES IN THE WASTE SECTOR (CONTINUED)

Orange kolonner = Ekstra til EU

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Interne oplysninger til EU rapporterings formatet		Tabel-nummer i NC8, August 2023	Name of mitigation action	Name of mitigation action	Single or group	List of single in group	Included in with measures GHG projection scenario KF22 / KF24	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Quantified Objective	Type of instrument	UnionPolicy	UnionPolicyList	Status of implemen-tation	Brief description	Start year of implemen-tation	End year of implemen-tation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in ktCO2e)**		Comments	Dimension(s)
Id	NECP_Pa mId			- in national language									Related ?	No.					2020	2030		
77	101		9-WA-17: Requirements for the municipalities on tenders for bulky waste schemes with re-sorting with regard to higher real recycling and reuse	Krav til kommunerne om udbud af storskraldordning m. eftersortering mhp. højere reel genanvendelse og genbrug	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	Municipalities are required to specify in the tender for bulky waste schemes that a sorting must be carried out in order to achieve a high level of real recycling and preparation for reuse. The sorting will ensure that a lesser part of the bulky waste is incinerated.	2021	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals
78	102		9-WA-18: Demand for smaller losses in recycling plastic	Krav om mindre tab i genanvendelse af plastik	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	The Executive Order on Waste stipulates that the municipalities must, as of 1 January 2022, set a requirement of 60 per cent actual recycling of the collected plastic waste when the waste is offered for treatment. The municipalities must ensure a high level of real recycling of all recyclable waste types.	2022	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals
79	103		9-WA-19: Target of 50% reduction of certain plastic takeaway packaging by 2026	Mål om 50% reduktion af visse takeaway-emballager af plastik i 2026	Single	NA	Yes / No	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	Target of 50% reduction of certain plastic takeaway packaging by 2026	Regulatory	Related	2	Adopted	A target of 50 percent reduction of certain plastic take-away packaging in 2026 is set. The goal must initially be sought to be achieved through a binding agreement and collaboration with the restaurant industry. If the goal is not reached by binding agreement, further regulation must be implemented.	2021	2050	Ministry of Environment of Denmark	NA	IE	The action is a target and will therefore not be included in the calculations for KF24.	Decarbonisation: GHG emissions and removals
80	104		9-WA-20: National implementation of extended producer responsibility for packaging	National implementering af udvidet producentansvar for emballage	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	The national implementation of the extended producer responsibility for packaging must be introduced no later than January 1st 2025. This will include all types of packaging in all types of materials. The extended producer responsibility must ensure that Denmark achieves the recycling targets for packaging in 2025 and 2030 by creating a strong financial incentive for reducing packaging, reusing packaging, and designing packaging that is easy to recycle and in high quality.	2021	2050	Ministry of Environment of Denmark	NA	IE	The effect of this action has been adhusted down for KF24.	Decarbonisation: GHG emissions and removals
81	105		9-WA-21: Target of 50% sorting of plastic for recycling in the agricultural sector	Mål om 50% udsortering af plast til genanvendelse i landbrugssektoren	Single	NA	Yes / No	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	Target of 50% sorting of plastic for recycling in the agricultural sector	Regulatory	Related	2	Adopted	As an initiative in the Danish climate agreement of June 2020 for a green waste sector and circular economy a sectoral coooperation with the agricultural sector has been established. The goal of the cooperation is to sort out 50% of plastic waste for reuse in 2025 from the aggricultural sector and 80% of plastic waste for reuse in 2030 from the aggricultural sector. As of 2020, approximately 25% of plastic waste from the aggricultural sector is reused. If the sectoral cooperation cannot document the necessary progress by the end of respectively 2023 and 2027 to achieve the goals, new iniatives will be implemented.	2021	2050	Ministry of Environment of Denmark	NA	IE	The action is a target and will therefore not be included in the calculations for KF24.	Decarbonisation: GHG emissions and removals
82	106		9-WA-22: Target of 50% sorting of plastic for recycling in the construction sector	Mål om 50% udsortering af plast til genanvendelse i bygge- og anlægssektoren	Single	NA	Yes / No	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	Target of 50% sorting of plastic for recycling in the construction sector	Regulatory	Related	2	Adopted	As an initiative in the Danish climate agreement of June 2020 for a green waste sector and circular economy a sectoral coooperation with the construction sector will be established. The goal of the cooperation is to sort out 25% of plastic waste for reuse in 2025 from the construction sector and 75% of plastic waste for reuse in 2030 from the construction sector. If the sectoral cooperation cannot document the necessary progress by the end of respectively 2023 and 2027 to achieve the goals, new iniatives will be implemented.	2021	2050	Ministry of Environment of Denmark	NA	IE	The action is a target and will therefore not be included in the calculations for KF24.	Decarbonisation: GHG emissions and removals
83	107		9-WA-23: New model for waste management to ensure increased recycling	Ny model for affaldstilsynet som skal sikre øget genanvendelse	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	The new and improved Danish waste inspection will be targeted at the companies with the greatest risk of non-compliance, and where the environmental risk of not complying with the waste rules is the greatest.	2021	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals
84	108		9-WA-24: Productivity gain on increased recycling of plastics through the synergy effect between a clear framework for the sector, the market gaining access to both household and acquired waste and the increase and streamlining of waste streams	Produktivitetsgevinst på øget genanvendelse af plastik ved synergieffekten mellem at der kommer klare rammer for sektoren, at markedet får adgang til både husholdningernes og erhvervet affald og at affaldsstrømmene øges og strømlines	Single	NA	Yes / Yes	5: Waste management/ waste	CO2	5_30: Demand management/reduction , 5_31: Enhanced recycling	No quantified objective	Regulatory	Related	2	Adopted	As a result of the Danish climate agreement of June 2020 for a green waste sector and circular econony a productivity gain on the increased recycling of plastics is expected. This is due to an expected synergy effect of the several initiatives in the agreement. This includes a clear framework for the sector, the market gaining access to both household and acquired waste and the increase and streamlining of waste streams.	2021	2050	Ministry of Environment of Denmark	NA	IE	The new waste projection model calculate synergy effects. The effect is therefore not inserted exogenously in KF24	Decarbonisation: GHG emissions and removals
85	109		9-WA-25: Ceiling over nitrous oxide emissions from large treatment plants	Loft over lattergasemissioner fra store renseanlæg	Single	NA	Yes / Yes	5: Waste management/ waste	N2O	5_36: Improved wastewater management systems	No quantified objective	Regulatory	Related	2	Adopted	By political decision, limits for nitrous oxide emissions from treatment plants that treat waste water that is the equivalent of at least 30,000 people's effluent (PE) will be introduced from 2025 onwards. These limit values are introduced to ensure that the total effluent from waste water treatment drops by 50 percent compared to today. Based on preliminary experience, it will, no later than 2025, be discussed by the political parties whether this limit should also be introduced for treatment plants that treat waste water that is the equivalent of less than 30,000 PE. Nitrous oxide emissions from treatment plants is the main source of greenhouse gas emissions from the Danish waste water utilities, but ongoing projects indicate a potential for significant emission reductions by implementing improvement initiatives. This includes adjusting the advanced online control of the aeration and dosing of a carbon source as well as lowering of the specific ammonium loading, taking into account the nitrous oxide emission.	2025	2050	Ministry of Environment of Denmark	NA	IE		Decarbonisation: GHG emissions and removals

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* Here "Yes" means included in the "with measures" projection scenario, in principle. In most cases not based on separate annual estimates for each mitigation action, but either as a result of the assumption that the measure has contributed to the observed level of total Danish greenhouse gas emissions in the most recent inventory year available, when the projection was elaborated and therefore used as the starting point for the projections, or as part of the integrated models used to project the level of annual greenhouse gas emissions in future years.

** For the individual mitigation actions included in this table, in the "Estimate of mitigation impact" columns, the notation key NA (Not Applicable) is used in the 2020-column, when the mitigation action was not implemented before 2021, and the notation key NE (Not Estimated) is used in the 2030-column, when the mitigation action was not included in the WEM projection scenario from 2024 ("KF24") - both by matter of principles. The former to signal that there is no effect of an action not yet implemented. The latter to signal that no effect of the action was included in the WEM projection scenario from 2024 ("KF24"). The latter is a matter of principle because WEM projection scenarios in Denmark are not calculated from the sum of the effects of individual mitigation actions, but are instead based on integrated models. Therefore it is not possible attribute the total effect in WEM projection scenarios to all individual mitigation actions included in the projection. The WEM projection scenario from 2024 ("KF24") is described separately in greater detail with focus on future greenhouse gas emission trends from the current level.