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Abstract

The Annual Climate Report is submitted every year per the Climate Act. The Report examines trends in emissions and sinks, sufficiency of planned measures to achieve targets, need for further measures, and implementation of measures in the Medium-term Climate Plan and Climate Plan for the Land Use Sector. The measures in the National Adaption Plan are also discussed.

In 2024, total emissions excluding LULUCF decreased compared to 2023. Emissions from the emissions trading sector decreased significantly. Emissions from the effort-sharing sector also decreased. However, they exceeded the annual emission allocation set for Finland for 2024.

The LULUCF sector was a source of emissions in 2024. Net emissions, i.e. the combined emissions and sinks of all sectors (including LULUCF), decreased slightly in 2024 compared to the previous year.

Without additional measures in the land use sector, it is likely that Finland will not meet its obligations under the EU LULUCF Regulation. If the deficit cannot be covered, it will transfer to the effort-sharing sector. In the additional measures scenario, the 2030 and 2040 emission reduction targets of the Climate Change Act will be met if CCUS solutions are included. Achieving the national climate neutrality target will require further action in LULUCF as well as in other sectors.

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Ilmastovuosikertomus 2025

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Tiivistelmä

Ilmastovuosikertomus annetaan ilmastolain mukaan vuosittain. Siinä tarkastellaan päästö- ja nielukehitystä, toimien riittävyyttä päästövähennystavoitteiden saavuttamiseksi, lisätoimien tarvetta sekä keskipitkän aikavälin ja maankäyttösektorin ilmastosuunnitelmien tavoitteiden ja toimien toteutumista. Lisäksi käsitellään sopeutumissuunnitelmaan sisältyviä toimia.

Vuonna 2024 kokonaispäästöt ilman maankäyttösektoria laskivat edellisvuoteen verrattuna. Päästökauppasektorin päästöt vähenivät selvästi edellisvuodesta. Myös taakanjakosektorin päästöt laskivat. Ne kuitenkin ylittivät Suomelle asetetun kiintiön vuonna 2024.

Maankäyttösektori oli vuonna 2024 päästölähde. Nettopäästöt, eli kaikkien sektoreiden (ml. maankäyttösektori) yhteenlasketut päästöt ja nielut, laskivat vuonna 2024 hieman edellisvuoteen verrattuna.

Ilman merkittäviä lisätoimia maankäyttösektorilla on todennäköistä, ettei Suomi saavuta EU:n LULUCF-asetuksen mukaisia velvoitteita. Mikäli LULUCF- sektorin vajetta ei saada katettua, siirtyy vaje katettavaksi taakanjakosektorilla. Politiikkatoimiskenaarion mukaan ilmastolain vuoden 2030 ja 2040 päästövähennystavoitteet saavutetaan kun otetaan huomioon CCUS-ratkaisut. Kansallisen hiilineutraaliustavoitteen saavuttaminen edellyttää lisätoimia maankäyttösektorilla sekä muilla sektoreilla.

Asiasanat ilmastopolitiikka, päästöt, raportointi, ilmastovuosikertomus, ilmastonmuutos, ympäristönsuojelu

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Referat

Enligt klimatlagen ska den årliga klimatberättelsen avlåtas varje år. I rapporten granskas utsläpps- och sänkutvecklingen, huruvida åtgärderna är tillräckliga för att uppnå målen, behovet av ytterligare åtgärder samt genomförandet av målen och åtgärderna i de sektorvisa klimatplanerna. Åtgärderna i anpassningsplanen behandlas också.

År 2024 minskade de totala utsläppen exklusive markanvändningssektorn jämfört med föregående år. Utsläppen från utsläppshandelssektorn minskade betydligt jämfört med föregående år. Utsläppen från sektorn för ansvarsfördelning minskade också. De överskred dock den kvot som fastställts för Finland 2024. Sektorn markanvändning var en utsläppskälla år 2024. Nettoutsläppen, dvs. de sammanlagda utsläppen och sänkorna minskade något under 2024 jämfört med föregående år.

Utan betydande ytterligare åtgärder är det troligt att Finland inte kommer att uppfylla sina skyldigheter enligt EU:s LULUCF-förordning. Om underskottet i LULUCF-sektorn inte kan täckas kommer underskottet att flyttas till sektorn för ansvarsfördelning. Enligt politikscenariot kan utsläppsminskningsmålen för 2030 och 2040 i klimatlagen uppfyllas om avskiljning av koldioxid beaktas. För att uppnå det nationella målet om klimatneutralitet kommer det att krävas ytterligare åtgärder inom markanvändningssektorn och andra sektorer.

Nyckelord	Klimatpolitik, utsläpp, rapportering, klimatårsberättelse, klimatförändring, miljövård		
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FOREWORD

As the international operating environment is transforming, climate policy is increasingly linked to international security, economy and competitiveness. In a volatile global context, a consistent climate policy is in Finland's interest. For example, phasing out fossil fuels is an important part of our security of supply.

The Government will continue its determined work to accelerate the clean transition. Green investments worth 300 billion euros are currently being planned in Finland. It is important for us to provide an attractive investment environment to ensure that the planned projects will take place.

In the Government's mid-term policy review session, we decided, among other things, to extend the previously agreed tax credit for large-scale investments in the clean transition. In June, we granted 50 million euros in support for investments to reduce emissions from transport, in particular, involving fossil fuel substitutes. These actions are an excellent example of the Government's strategic goal to make Finland a major player in clean energy.

Our goal is to build new industrial activity around carbon capture and affordable clean electricity to replace a fossil-based economy. We play an active role in the development of EU regulation of technological carbon sinks. We are also currently preparing a completely new support instrument for chimney-top carbon capture in Finland, for which we have earmarked 140 million euros in this year's Budget. Furthermore, we are creating a legal framework for the transfer of carbon dioxide from Finland for permanent geological storage.

Finland's climate work is guided by binding EU commitments and the national Climate Act. Under the Government Programme, Finland is committed to achieving carbon neutrality by 2035. The Annual Climate Report includes an assessment of the adequacy of climate action and the need for further action to meet EU commitments and national targets. It provides an important knowledge base to support the planning of climate action.

While the clean energy transition is already a success story for Finland, the Annual Climate Report shows that we need further action to meet our climate targets. We are currently preparing a national Energy and Climate Strategy and a Medium-term Climate Change Policy Plan to outline climate action.

Action is needed in the land use sector in particular, above all because of EU commitments. In addition, we need to strengthen the knowledge base of the land use sector. Up-to-date monitoring is not only a scientific necessity, but also a prerequisite for sound climate policy. In our mid-term policy review, we decided to allocate eight million euros to improve the calculation of carbon sinks and carbon pools through an observation system. We will also invest a total of 15 million euros in preventing forest damage, promoting forest fertilisation and expanding forest area during 2026 and 2027.

The cost of inaction is greater than the cost of climate action to be implemented now. Finland can lead the way and benefit from the clean transition. With clean solutions, we will create jobs in Finland, increase our export potential and invest in the wellbeing of the future.

Helsinki, 27 June 2025

Sari Multala, Minister of Climate and the Environment

SUMMARY

Provisions on the preparation of the Annual Climate Report are laid down in the Climate Act (423/2022). By means of the Annual Climate Report, the Finnish Government reports to Parliament each year data on the trends in emissions and sinks and assesses the adequacy of the measures with regard to the achievement of the targets set and the need for any additional measures. The Annual Climate Report is not expected to specify the additional measures required. The Annual Climate Report must contain data on the achievement of the targets set in the Medium-term Climate Change Policy Plan and the Climate Plan for the Land Use Sector. In addition, it reports on the adequacy and effectiveness of the adaptation measures contained in the National Climate Change Adaptation Plan.

Annual Climate Reports have been issued since 2019. Parliamentary readings of previous Annual Climate Reports have raised development needs on the basis of which the report has been made more diverse, with a view to providing the most comprehensive situation report possible concerning development trends in climate policy. The Annual Climate Report also addresses cross-cutting measures and annually changing themes. Cross-cutting measures have been treated more concisely than in previous years to avoid duplication, as they will be addressed extensively in the Medium-term Climate Change Policy Plan (MTCP) to be presented to Parliament this year. The changing themes discussed this year include climate change and health and the costs of inaction.

Emissions trends in 2024

The data reported in the Annual Climate Report on actual emissions and sinks is based on data published by Statistics Finland. The 2025 Annual Climate Report reports the final emissions data for 2023 and proxy estimate data for 2024.

Finland's total emissions excluding the land use, land use change and forestry (LULUCF) sector amounted to 38.8 Mt CO_2-eq in 2024. Emissions decreased by 2.3 Mt CO_2-eq from 2023. Since 2005, total emissions excluding the LULUCF sector have declined by a total of 31.1 Mt CO_2-eq, or 44%, with the average annual reduction being around three percentage points.

Net emissions (i.e. the total emissions and sinks of all sectors, incl. the LULUCF sector) amounted to 52.3 Mt CO_2-eq in 2024, down 0.8 Mt CO_2-eq from 2023. The average between 2005 and 2024 was 50.7 Mt CO_2-eq.

According to proxy estimate data, net emissions from the LULUCF sector amounted to 13.5 Mt CO_2-eq in 2024. The LULUCF sector used to be a significant net sink in Finland, but the sector turned into a net source of emissions from 2018 onwards. This was especially due to changes in the carbon sink of forests, mainly driven by increased harvesting rates, slowing tree growth and increased soil emissions (for more information, see the fact box in Section 3.4.).

The estimate of the sum of emissions and removals in the LULUCF sector, i.e. the size of the sector's carbon sink or source of emissions, will become more precise when the 2024 preliminary data is released. The sum of emissions and removals, i.e. the net removals or net emissions, between 2005 and 2024 ranged from -32.5 Mt CO_2-eq (in 2009) to 13.5 Mt CO_2-eq (in 2024).

Emissions from installations covered by the EU Emissions Trading System (EU ETS) amounted to 13.3 Mt CO_2-eq in 2024. Emissions decreased by 2.1 Mt CO_2-eq, or 14%, from the previous year, which was due to the consumption of coal decreasing by 47% and the consumption of peat decreasing by 33% year on year. Since 2005, total emissions from the EU ETS sector have declined by a total of 22 Mt CO_2-eq or 62%.

According to proxy estimate data greenhouse gas (GHG) emissions from the effort sharing sector are at 25.4 Mt CO_2-eq in 2024, down 0.2 Mt CO_2-eq from 2023. Effort sharing sector emissions decreased by a total of 26% in 2005–2024 – at a clearly slower pace than EU ETS sector emissions. The most significant emission sources in the effort sharing sector are transport, agriculture, building-specific heating, non-road mobile machinery, waste treatment and incineration, and fluorinated gases (F-gases).

Reaching climate targets

The National Climate Act sets emission reduction targets for 2030, 2040 and 2050 relative to 1990. To meet the 2030 emission reduction target, total emissions will need to be no more than 28.7 Mt CO_2-eq in 2030 and 14.4 Mt CO_2-eq in 2040. The act also lays down the aim for Finland to be carbon neutral in 2035 and carbon negative soon after that.

The assessments of the achievement of climate targets presented in the Annual Report are based on the KEITO project scenarios, their preliminary results and supporting estimates (Appendix 1). Based on these, the rate of emissions reductions is insufficient to achieve the emissions reduction targets of 60% for 2030 and 80% for 2040 set in the Climate Act. The gap to the 2030 target is about 0.7 Mt CO_2-eq and to the 2040 target it is 2.8 Mt CO_2-eq, which means that the combined need for additional measures in the emissions trading and effort sharing sectors is of this order of magnitude. According to the available policy scenario, the 2030 and 2040 emission reduction targets of the Climate Act can be met when solutions based on carbon capture are taken into account.

Reaching the carbon neutrality target of the Climate Act requires that emissions do not exceed removals in 2035. The latest scientific knowledge and situational picture concerning the LULUCF sector have updated significantly in recent decades, which is reflected in both historical trends and forward-looking scenarios. The policy scenario used for the LULUCF sector suggests that the need for additional measures to achieve the 2035 carbon neutrality target is of the order of up to 34 Mt, taking into account the emissions trends under the policy scenario for the effort sharing and emissions trading sectors. However, for technical modelling reasons, the KEITO policy scenario was not able to take into account the climate impact of the measures included in the package of measures to strengthen forest growth and carbon sinks for the LULUCF sector. Achieving the target requires additional measures in the LULUCF as well as in other sectors.

In the absence of significant additional measures in the LULUCF sector, it is also likely that Finland will not achieve the commitments laid down in the EU's LULUCF Regulation. The extent of the deficit for the 2021–2025 period is estimated at 110–115 Mt CO_2-eq. If the flexibilities under the LULUCF Regulation are available, the deficit is in the range of 83–88 million tonnes. It is possible to cover the deficit in the LULUCF sector by acquiring an equivalent amount of LULUCF units from other Member States. However, the availability and prices of these units are uncertain.

The revised EU Effort Sharing Regulation sets for Finland the obligation to reduce emissions in the effort sharing sector by 50% in 2030 relative to 2005 levels, which means emissions amounting to around 17.1 Mt CO_2-eq. Finland's emission allocation for 2024 was 25.3 Mt CO_2-eq, which was exceeded by around 0.1 Mt CO_2-eq. In 2021, 2022 and 2023, emissions fell 1.4, 1.5 and 1.0 Mt CO_2-eq below the allocated level, respectively. Consequently, Finland has surplus emission allocations for the 2021–2024 period of 3.8 Mt CO_2-eq. Based on the scenario used here,

emissions in the effort sharing sector would remain within the emission allocations set for the 2021–2030 period, using the flexibilities under the Effort Sharing Regulation, if the emission reductions projected for 2025–2030 were fully achieved.

The transfer of the LULUCF deficit to the effort sharing sector would entail a transfer of the corresponding amount of emission allocations from the effort sharing sector to the LULUCF sector. The deficit in the effort sharing sector should be covered by additional measures in the effort sharing sector or by the purchase of emission allocations from other Member States. Due to the already ambitious effort sharing obligation and the magnitude of the deficit of the LULUCF sector, covering the deficit to any significant extent by means of additional measures in the effort sharing sector is in practice impossible. There is currently no certainty on the availability or price of emission allocations in the effort sharing sector. If the annual emission allocation for the effort sharing sector is not met in any one year, the deficit is multiplied by a factor of 1.08 and added to the following year's emissions. If the LULUCF balance assigned for each Member State is not reached in the four-year period from 2026 to 2029, the deficit will be multiplied by a factor of 1.08 and added to the 2030 target.

The preparation of the next Medium-term Climate Change Policy Plan (MTCP3) and Energy and Climate Strategy is underway. As part of the Energy and Climate Strategy, an programme to pay off emission debt will be drawn up in line with the Government Programme. The documents being prepared contain additional measures needed to meet the objectives of the Climate Act and EU commitments. Both the Energy and Climate Strategy and the new MTCP are due to be presented to Parliament in reports during 2025.

Measures by sector and plan

Within the scope of the general emissions trading system (ETS1), greenhouse gas emissions are primarily reduced by means of price controls created by the emissions trading system. The price of emission allowances started to rise in 2021 and has since ranged between EUR 50 and EUR 106 per tonne of CO_2. Alongside the EU ETS, there are also national policy instruments in place that can influence emissions trends in ETS installations. By spring 2025, for example, all installations that previously used coal for energy production have either been closed or converted to use substitute fuels. This development has been driven by the 2019 Act on the Prohibition of the Use of Coal in Energy Production. Emissions from the emissions trading sector will continue to decline towards 2030 and 2040. The levels achieved under the policy scenario are 10.9 Mt in 2030 and 4.7 Mt in 2040. If solutions based on carbon capture are included in the emissions trading sector, the levels are 10.2 Mt in 2030 and -0.4 Mt in 2040.

Progress has been made in implementing the Medium-term Climate Change Policy Plan (MTCP2) adopted in 2022.

- In 2024, emissions from transport started to rise, driven in particular by the relative consumption of biofuel. With the exception of 2024, transport emissions have been on a sufficient trajectory to halve transport emissions by 2030. Emissions will continue to decline towards 2040, but will not yet reach sufficient reductions to achieve fossil-free transport by 2045.

- In 2024, emissions from agriculture decreased by 0.05 Mt compared with the previous year. Emissions from agriculture have not decreased much since the early 1990s, but under both the baseline scenario with existing measures (WEM) and the policy scenario with additional measures (WAM), measures will manage to bring emissions downwards. Under the policy scenario, emissions will be reduced to 5.4 Mt by 2030, and by a further 0.2 Mt by 2040, reaching the level of 5.2 Mt.

- Emissions from building-specific heating, non-road mobile machinery and non-ETS energy production fell to 7 Mt from the previous year. Under the baseline scenario, emissions from non-road machinery will decrease to 2.3 Mt by 2030 and to 1.7 Mt by 2040, while emissions from heating will fall to 0.7 Mt by 2030 and to 0.3 Mt by 2040.

- Industrial emissions, excluding energy and F-gas emissions, decreased by 0.2 Mt in 2024 compared with the previous year.

- Waste treatment emissions decreased by 0.1 Mt, while waste incineration emissions amounted to 0.7 Mt in 2023. The 2024 data will be revised during 2025. The emissions trend for waste treatment is decreasing, but there is uncertainty about the trend for waste incineration.

The main policy measures affecting emissions in the effort sharing sector are the distribution obligations for road transport and light fuel oil, energy efficiency measures and emissions trading for fossil fuel distribution starting in 2027. Climate work also continued at municipal and regional levels in 2024.

The Climate Plan for the Land Use Sector adopted in 2022 was implemented in 2024 within existing funding. There are other policy instruments in place in the LULUCF sector, but their primary objective is not to promote measures under the Climate Plan. The Climate Plan's monitoring system was compiled during 2024 and the implementation data is presented by measure in Appendix 5.

The National Climate Change Adaptation Plan until 2030 (NAP2030) sets 24 targets and outlines measures to achieve them. Implementation progressed during 2024; in addition, a proposal for a strategic LIFE project was also prepared. The project aims to ensure significant EU funding for the extensive implementation of NAP2030 measures starting from 2026.

Annually changing theme: Climate action and health – how to promote both at the same time?

Climate change poses significant health risks, particularly through heat waves, slips and falls and the spread of new diseases, while also putting a strain on the healthcare system. Adverse health effects can be addressed by means such as urban planning, infrastructure development and healthcare and social welfare measures. In addition, climate change mitigation activities, such as a plant-based diet and active mobility, contribute to both emission reductions and human health.

Annually changing theme: Costs of inaction

Failure to tackle climate change will entail significant economic risks and costs both globally and in Finland, including weaker economic growth, infrastructure damage and increased adverse health effects. Rapid and proactive climate action can not only reduce these costs, but ideally also reap the benefits of leadership and contribute to economic growth, competitiveness and energy system self-sufficiency. Investing in a clean transition and renewable energy will provide long-term economic and environmental benefits, which can strengthen Finland's position in global markets.

1 Introduction

Under the Climate Act (432/2022), the climate policy planning system sets out the targets for reducing greenhouse gas emissions, strengthening sinks and adapting to climate change, as well as the measures required to achieve the targets in different administrative branches. The planning system consists of the following climate policy plans: Long-term Climate Plan, National Climate Change Adaptation Plan, Medium-term Climate Change Policy Plan and Climate Plan for the Land Use Sector.

Provisions on the preparation and content requirements of the Annual Climate Report are laid down in the Climate Act. The Government submits an Annual Climate Report to Parliament each calendar year to report on data on the trends in greenhouse gas emissions and removals, assess the adequacy of measures to meet the targets set for the following 15 years and the need for additional measures required, and provide data on the achievement of the emission reduction targets included in the Medium-term Climate Change Policy Plan and the Climate Plan for the Land Use Sector. In addition, the Annual Climate Report reports on the adequacy and effectiveness of the adaptation measures contained in the National Climate Change Adaptation Plan. Under the act, the public must be informed of the publication of the Annual Climate Report and its key content.

Annual Climate Reports have been issued since 2019 and their content has become more comprehensive than required by the Climate Act. In this year's Annual Climate Report, cross-cutting measures across sectors have been dealt with in other sections, as appropriate, rather than as a separate chapter as in previous years. As before, this year's report also covers annually changing themes (Chapter 6, Climate change and health, and Chapter 7, Costs of inaction). As in previous years, a separate communication summary is also published on the Annual Climate Report.

In this year's Annual Climate Report, the status of climate policy implementation is described as it was in spring 2025. Where appropriate, the preparation of the report has taken account of the report of the Environment Committee on the Annual Climate Report for 2024 (Environment Committee Report 2/2025).

Fact box: Climate Barometer 2025 – Climate solutions seen as an opportunity for Finland

Finns' understanding of the progress of climate change and the urgency of action remains strong. Climate solutions are seen as a driver of Finland's competitiveness, according to the 2025 Climate Barometer. The Climate Barometer is a survey of people's views and attitudes towards climate change and climate action.

Carried out since 2015, the previous Climate Barometer was published in2023. The Barometer is used to monitor changes in attitudes and gauge people's opinions on current climate themes.

According to the survey, climate solutions and the green transition are viewed as an opportunity for Finland. Seventy-five per cent of respondents see climate-resilient solutions, such as low-emission industry, as a prerequisite for Finland's sustainable economy. An equal share of respondents consider that municipalities could boost their vitality by attracting green investments to the area. A clear majority (86%) consider that Finland can improve its competitiveness by exporting clean technology solutions to the world.

The majority of Finns support climate action to achieve the carbon neutrality target enshrined in the Climate Act. Sixty-two per cent of those surveyed consider that Finland should take adequate climate action to achieve carbon neutrality by 2035. Seventy-five per cent of the respondents consider that more attention should be paid to forest harvesting and management practices in order to preserve carbon sinks. Seventy-nine per cent believe that landowners, such as farmers and forest owners, should be supported and encouraged to adopt more emission reduction and climate-resilient measures.

Compared with the previous round of the survey, the biggest change has been in Finns' attitudes towards environmentally sustainable consumption. More than half (53%) of respondents say they have cut back on purchasing goods for climate reasons. This represents an increase of ten percentage points compared with the survey conducted two years ago. As many as 91% of the respondents consider that products should be designed to last longer even if this meant that they would cost more.

Of the respondents, 43% have changed their lifestyles to mitigate climate change, i.e. have changed their means of mobility, eating habits or types of housing. This is five percentage points more than in the previous Barometer conducted two years ago. Sixty-nine per cent feel that a climatarian, plant-dominant diet should cost less than nutrition with high emissions. This represents an increase of 11 percentage points compared with the previous survey round.

Awareness of the urgency of climate action and the impacts of climate change is slightly increasing. Seventy-seven per cent of survey respondents see an urgent need to tackle climate change, representing an increase of five percentage points compared with the previous survey. A large majority (86%) agree that the impacts of climate change are already being felt around the world. This represents an increase of four percentage points compared with the previous survey.

Sixty-seven per cent of respondents are concerned about the impact of climate change on Finland. Most Finns are already experiencing the effects of climate change in their everyday lives. For example, 62% of the respondents felt that the recent winters have been milder.

The Climate Barometer was commissioned by the Steering Group for Central Government Climate Communications. A total of 1,026 people participated in the Climate Barometer conducted by Verian. The respondents were aged 15 years or over and they came from different parts of Finland, excluding Åland. The margin of error is about three percentage points in either direction.

2 Climate targets

2.1 National targets set by the Climate Act

The Climate Act (423/2022) includes a carbon neutrality target for 2035 and emissions reduction targets for 2030 and 2040, as well as an updated target for 2050. The emission reduction targets are 60% by 2030, 80% by 2040 and 90% (while still aiming at 95%) by 2050 compared with the 1990 levels. In addition to reducing emissions, the act also includes a target for increasing sinks to meet the carbon neutrality target by 2035 and beyond. The Climate Act is a framework act laying down provisions on the climate policy planning system and monitoring. Prime Minister Orpo's Government was appointed on 20 June 2023. According to the Government Programme, the Government is committed to the targets of Finland's national Climate Act. The Sámi Climate Council and the Climate Panel have acted in accordance with their responsibilities under the Climate Act.

2.2 EU climate targets

Under the European Climate Law, the EU is committed to reducing its net greenhouse gas (GHG) emissions by at least 55% by 2030 compared with 1990 levels, to achieving climate neutrality by 2050 and to aiming to achieve negative emissions thereafter. At a later stage, possibly in 2025, the EU's 2040 climate target will be included in the European Climate Law as a milestone between the 2030 and 2050 targets. The implementation of the Fit for 55 package at EU level is on track, except for the Energy Taxation Directive, where an agreement has yet to be reached. On 1 April 2025, the Commission adopted a proposal to amend the Regulation on CO_2 emission performance standards for passenger cars and vans, and its consideration has progressed in the Council and the European Parliament. The proposal introduces flexibility for manufacturers' compliance with CO_2 emission performance standards for the calendar years 2025 to 2027.

Under the updated legislation, emissions must be reduced by 62% in the EU ETS sector and by 40% in the effort sharing sector by 2030 compared with 2005 levels. The Member State-specific obligation set for Finland is to reduce emissions in the effort sharing sector by 50% by 2030 relative to 2005 levels. In addition, the emission trading system concerning the distribution of fossil fuel (ETS2) will be operational from 2027 and will in part cover the use of fossil fuel in the effort

sharing sector. The revised Land Use, Land Use Change and Forestry (LULUCF) Regulation did not change regulation for the 2021–2025 period, which means that the accounted removals must be at a level at least equivalent to the accounted emissions. This 'no-debit' rule applies both to the EU as a whole and to individual Member States. The key elements of the Regulation revised for the 2026–2030 period are the EU-wide net carbon sink target of 310 Mt CO_2-eq for 2030, a transition to a GHG inventory-based calculation system, and a transition to net GHG removal targets in the entire LULUCF sector for each Member State. The climate targets determined in EU law for the EU ETS, effort sharing and LULUCF sectors are means of implementing the EU's emission reduction commitment (nationally determined contribution, NDC) to the Paris Agreement on climate change.

2.3 The international operating environment and the Paris Agreement

The Paris Agreement on climate change was adopted in 2015 and entered into force in November 2016. The Agreement has been ratified by 195 Parties and covers more than 97% of global GHG emissions. The Agreement applies to the post-2020 period and is in effect until further notice. In November 2021, the 26th Conference of the Parties (COP26) to the UN Framework Convention on Climate Change (UNFCCC) in Glasgow finalised the rules for the implementation and application on the UNFCCC by agreeing on further modalities for Article 6 on market mechanisms and on consistent and transparent reporting of climate action and emissions. The goal recorded in the Paris Agreement is to hold the increase in the global average temperature to well below two degrees Celsius, pursuing efforts to limit the average temperature increase to 1.5°C above pre-industrial levels. A further goal is to strengthen the ability of the Parties to adapt to climate change and foster climate resilience and to direct financial flows towards low-carbon development. In order to achieve the temperature goal, global greenhouse gas emissions will need to be brought downwards as soon as possible and quickly reduced thereafter so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.

The key elements of the Paris Agreement include the Parties' obligation to formulate their nationally determined contributions (NDCs) used to declare their emissions reduction and adaptation targets and report their planned climate action. The contributions must be tightened at least every five years and must correspond to the highest possible target level of the Party. Based on current Parties' emission reduction targets and their implementation plans, warming will

exceed two degrees Celsius. The Intergovernmental Panel on Climate Change (IPCC) states that emissions reduction measures must therefore already be accelerated during the current decade in order to reach the international targets set to limit global warming and to achieve a downturn in global emissions by 2025 at the latest.

Collective progress made by countries towards the Paris Agreement targets was reviewed by means of the first global stocktake at COP28 Climate Change Conference in Dubai. The purpose of the stocktake is to inform the preparation of the next NDCs so that the targets of the Paris Agreement will be reached. Key takeaways from Dubai include the call to transition away from fossil fuels. The Parties must announce their next, 2035 emissions reduction targets before the COP30 to be held in Brazil in November 2025. The EU is also preparing to announce its own emission reduction target by no later than September 2025.

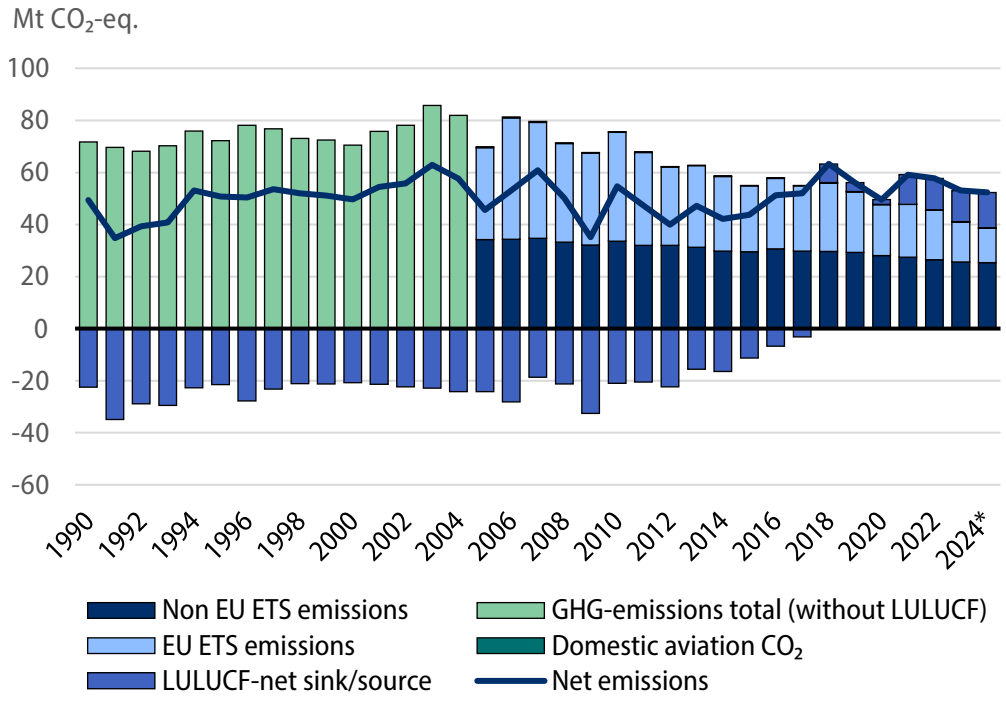
As a Party to climate treaties, Finland has undertaken to finance developing country Parties' climate actions and report on this finance. In Finland, this finance is part of the development cooperation budget (see Appendix 2). Finland reports to the UN on climate finance through the National Communications submitted every four years and through Biennial Transparency Reports (BTR). In addition, data on climate finance is submitted annually in a report under Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action. Under the Paris Agreement, Finland has, as one of the so-called developed countries, committed to the collective goal of mobilising jointly USD 100 billion in climate finance from various sources (public, private and innovative sources) in 2020–2025. There is no country-specific allocation of the mobilisation target, but in practice the EU as a whole currently accounts for a large part of its implementation. The New Collective Quantified Goal of USD 300 billion per year was agreed at COP29 in Baku in November 2024.

3 Greenhouse gas emissions from 2005 to 2024

3.1 Total emissions

Finland's total emissions excluding the LULUCF sector amounted to 41.1 Mt CO_2-eq in 2023 and, based on instant preliminary data, to 38.8 Mt CO_2-eq in 2024. Emissions decreased by 2.3 Mt CO_2-eq in 2024 from the year before. Since 2005, total emissions without the land use sector have declined on average about three percentage points a year. Over the past five years, the annual rate of reduction has averaged almost six per cent year on year. Over the period from 2005 to 2024, total emissions decreased by 31.1 Mt CO_2-eq, or 44%. The LULUCF sector used to be a significant net sink in Finland, but the sector's sink effect has decreased in recent years, and in 2018–2024 the sector as a whole was a net source of emissions. The 2024 proxy estimate data shows that the LULUCF sector as a whole was an emission source of 13.5 Mt CO_2-eq (Figure 1).

Figure 1. Total emissions trends in 1990–2024. Negative values indicate a situation where the LULUCF sector was a net sink. 'Total emissions' refers to the combined emissions of the emissions trading and effort sharing sectors. From 2005 onwards, total emissions without the LULUCF sector have been divided between the effort sharing and EU ETS sectors. *The 2024 data is proxy estimate.



Trends in net emissions play an essential role in terms of climate change mitigation. 'Net emissions' means the difference between emissions and removals. Net emissions ranged between 35.2 Mt CO_2-eq and 63.3 Mt CO_2-eq in 2005–2024, averaging 50.7 Mt CO_2-eq. In 2024, net emissions decreased by 0.8 Mt CO_2-eq year on year, amounting to 52.3 Mt CO_2-eq. The net emissions trend was influenced by a decrease in emissions in the effort sharing and emissions trading sectors and an increase in net emissions in the LULUCF sector by 1.5 Mt CO_2-eq compared with the previous year (Figure 1).

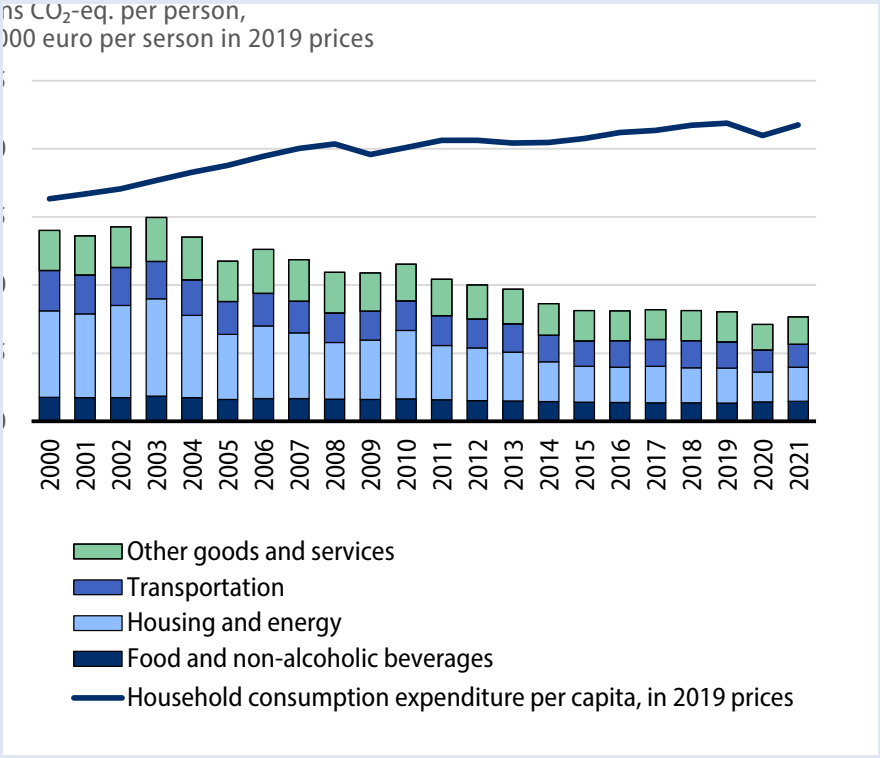
Fact box: Carbon footprint of consumption

Consumption-based emissions are calculated differently from Finland's official, production-based emissions data, which is used to assess progress towards climate targets. Consumption-based emissions also include overseas emissions from production of imported goods, while excluding those from production of goods manufactured in Finland for export. Besides household consumption, consumption-based emissions are also generated by public consumption and investment and, to a lesser extent, from activities of non-profit associations. Consumption-based emissions are also referred to as 'carbon footprint'.

Emissions from the main categories of carbon footprint have decreased in the review carried out in the KULO project over the 2000–2021 period as follows: housing and energy -60%, other goods and services -32%, transportation -43%, and food and non-alcoholic beverages -17%. The share of housing and energy in the carbon footprint of consumption fell from 45% to 33% between 2000 and 2021. At the same time, the share of food and non-alcoholic beverages increased by six percentage points. Other goods and services grew by five percentage points, whereas the share of transportation remained almost unchanged.

Since 2003, emissions intensity has decreased almost every year, apart from four exceptional years. The annual carbon footprint per capita has stood at around eight tonnes of CO_2-eq since 2015. In 2021, it was around 7.7 t CO_2-eq. Consequently, there has been some absolute decoupling between consumption and the resulting emissions, because while consumption has increased, emissions from consumption have decreased.

Figure 2. Consumption expenditure and consumption-based emissions per capita by main category in 2000–2021. Calculation and graph produced by the Policy Instruments for Sustainable Consumption (KULO) project.



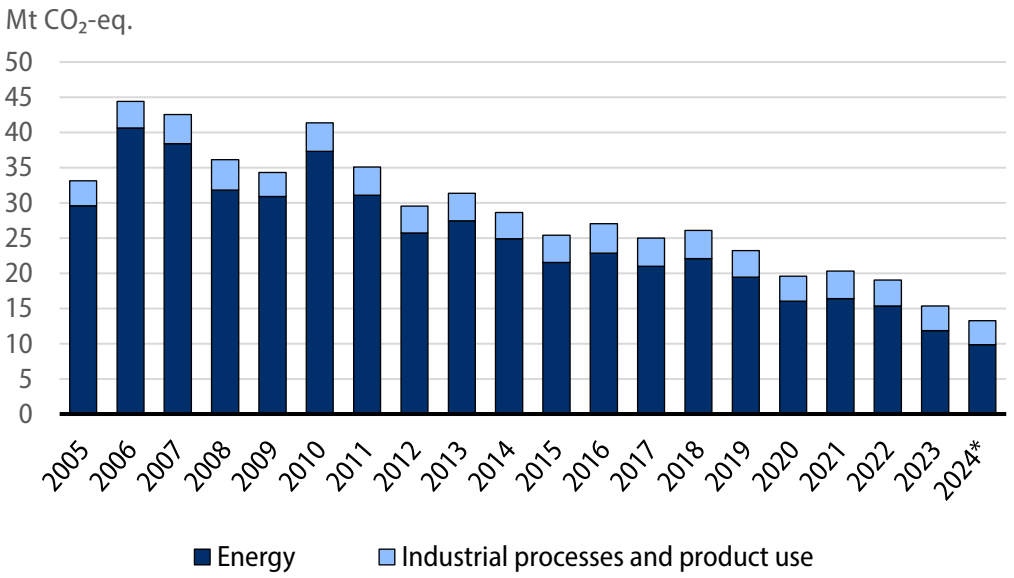
Various calculators and online services are available for individual consumers to assess their own carbon footprint, such as the Climate Diet Calculator updated by the Finnish Environment Institute in December 2024. The calculator also takes into account technological developments and policy guidance, meaning that when emissions from energy production decline over time, for example, the carbon footprint of consumption also decreases, even if consumption patterns do not change.

3.2 Emissions trading sector

In 2024, the EU's general emissions trading system (EU ETS1) covered large industrial and energy production installations, intra-European aviation, intra-European maritime transport and 50% of maritime transport between the EU and third countries. From 2027, emissions trading for fossil fuel distribution, known as ETS2, will be applied gradually in the effort sharing sector. When discussing the emissions trading sector, Sections 3.2, 5.1 and 5.2.7 of this Annual Climate Report refer to general emissions trading (EU ETS1).

In 2024, emissions from Finnish installations included in general emissions trading (ETS1) totalled 13.3 Mt CO_2-eq (Figure 3), accounting for 34% of total emissions in Finland. Emissions decreased by 2.1 Mt CO_2-eq, or 14%, year on year. This was due to the consumption of coal and peat decreasing by 47% and by 33% year on year, respectively. Consumption of renewable fuels that meet the sustainability criteria increased by one per cent. Since 2005, emissions have decreased by an average of about 5% per year and, overall, emissions from the emissions trading sector have decreased by 22 Mt CO_2-eq, or 62%. In 2024, energy-related emissions accounted for around 74% and emissions from industrial processes and product use for around 26% of the total emissions in the emissions trading sector (Figure 3).

Figure 3. GHG emissions from installations covered by the EU ETS in 2005–2024 by emission source. *The 2024 data is instant preliminary data.



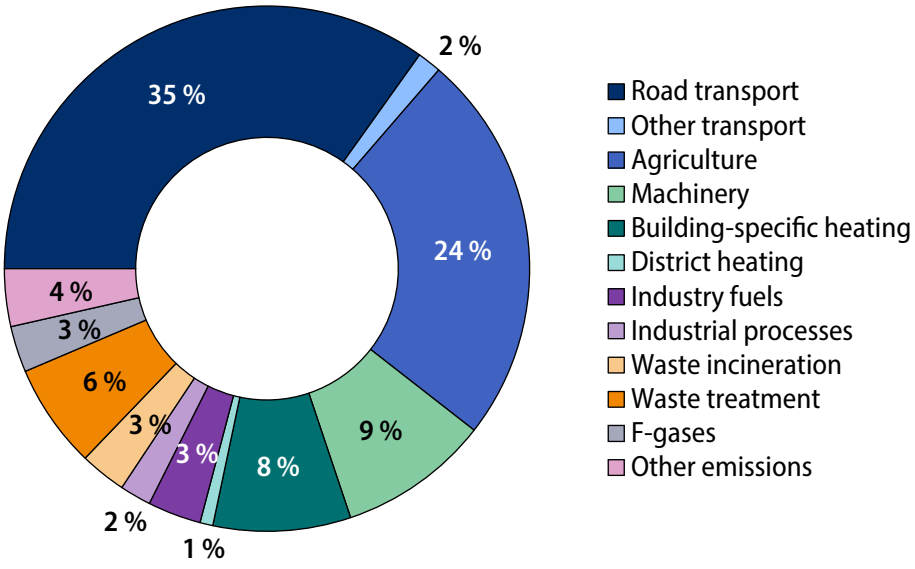
A key factor contributing to emissions trends in the emissions trading sector is the price of an emission allowance. A high allowance price will encourage operators to reduce their use of fossil fuels and switch to lower-emission energy sources and industrial processes. Combustion-based electricity production has decreased, while wind and nuclear power have grown significantly. Electric boilers, heat pumps and the use of surplus heat have become more common in industry and district heating.

Waste incineration plants will be obliged under the Emissions Trading Act to report emissions data to the Finnish Energy Authority for the first time in 2025. All nine installations submitted a verified emissions report for 2024 by the deadline. Emissions from waste incineration plants totalled one million tonnes of carbon dioxide. These emissions are accounted for in the effort sharing sector. However, emissions from co-incineration plants are accounted for in the emissions trading sector also for the waste raw material they use.

3.3 Effort sharing sector

The effort sharing sector covers all of the greenhouse gas emissions reported in the national greenhouse gas inventory that are not included in the emissions trading system or the LULUCF sector. However, CO_2 emissions from domestic aviation in accordance with the inventory are not included in the effort sharing sector. The main sources of emissions in the effort sharing sector include transport, agriculture, building-specific heating, non-road mobile machinery, waste treatment and incineration (excluding co-incineration plants), and F-gases. In addition, emissions from non-EU ETS industrial and energy installations, the Defence Forces and other unspecified fuel use as well as non-CO_2 emissions (CH_4 and N_2O) from EU ETS sector energy use are accounted for in the effort sharing sector. Figure 4 shows the breakdown of emissions in the effort sharing sector in 2023.

Figure 4. Breakdown of GHG emissions by source in the effort sharing sector in 2023. Data for 2024 will be available with the same accuracy towards the end of 2025.



Greenhouse gas emissions have decreased more slowly in the effort sharing sector than in the emissions trading sector. Emissions in the effort sharing sector amounted to 25.6 Mt CO_2-eq in 2023 and, based on proxy estimate data, to 25.4 Mt CO_2-eq in 2024, equating to a decrease of 0.2 Mt CO_2-eq from the previous year.

The total emissions of the effort sharing sector in 2024 stood at about 26% below 2005 levels. Transport emissions (excluding CO_2 emissions from domestic aviation) have decreased by around 2.9 Mt CO_2-eq, or 23%, since 2005. Emissions from waste treatment and F-gases are also currently clearly lower than in 2005 (Table 1).

Table 1. Emissions from the effort sharing sector in 2005 and 2023 and in the 2024 proxy estimate data and change from 2005 (in Mt CO_2-eq and %). Inventory data for building-specific heating and non-road mobile machinery for 2024 will be completed in December 2025. Data for some sub-sectors is not yet available for 2024 (indicated by a dash). However, the Total row also includes this data.

	2005	2023	2024	Change 2005–2023 (Mt CO_2-eq)	Change 2005–2023 (%)
Transport	12.6	9.3	9.7	-2.9	-23%
Agriculture	6.4	6.2	6.1	-0.2	-4%
Building-specific heating	4.1	1.6	–	–	–
Non-road mobile machinery	2.6	2.4	–	–	–
Waste treatment	3.1	1.6	1.5	-1.6	-51%
F-gases	1.1	0.7	0.6	-0.5	-44%
Industrial processes and other product use, excl. F-gases	0.5	0.5	0.4	-0.1	-25%
Other emissions	3.9	3.2	–	–	–
Total	**34.3**	**25.6**	**25.4**	**-8.9**	**-26%**

3.4 Land use, land use change and forestry (LULUCF) sector

The land use, land use change and forestry (LULUCF) sector comprises six land use categories: forest land, cropland, grassland, wetlands, settlements and other land as well as harvested wood products. The LULUCF net removals/emissions are obtained by adding up the emissions and removals of all of the land use categories and changes in harvested wood products. Annual changes in the LULUCF emissions balance have typically been large compared with other sectors. The situation in the LULUCF sector has changed significantly over the past decade. This change is explained in particular by persistently high harvesting levels, increased soil carbon dioxide emissions from peatland forests, a decline in soil carbon sinks and litter input in mineral forests, and a reduction in the total tree biomass (total of leaves, branches, trunk, root system). See Appendix 1 for more information on the updating of the statistics. In addition, the gradual decline in timber imports from Russia since 2008 and their complete cessation in 2022 have influenced the

domestic demand for timber. As a result, harvesting levels have increased on the early 2000s and have remained relatively high in recent years, although there have been year-to-year fluctuations. The increase in forest harvesting has also been driven by the industrial demand for roundwood, especially in the pulp and paper industry. At the same time, the use of wood fuels and by-products in energy production has become more prevalent, increasing the demand for domestic wood. Methodologies for calculating GHG emissions in the LULUCF sector have also been developed and the National Forest Inventory (NFI) has provided updated information on the growing stock, which has contributed to highlighting the deterioration of the forest land sink.

Fact box: Why has the forest carbon sink changed?

The change in forest carbon sinks compared with the past has become visible as a result of methodology development and new field data. This change is mainly due to the following three key factors:

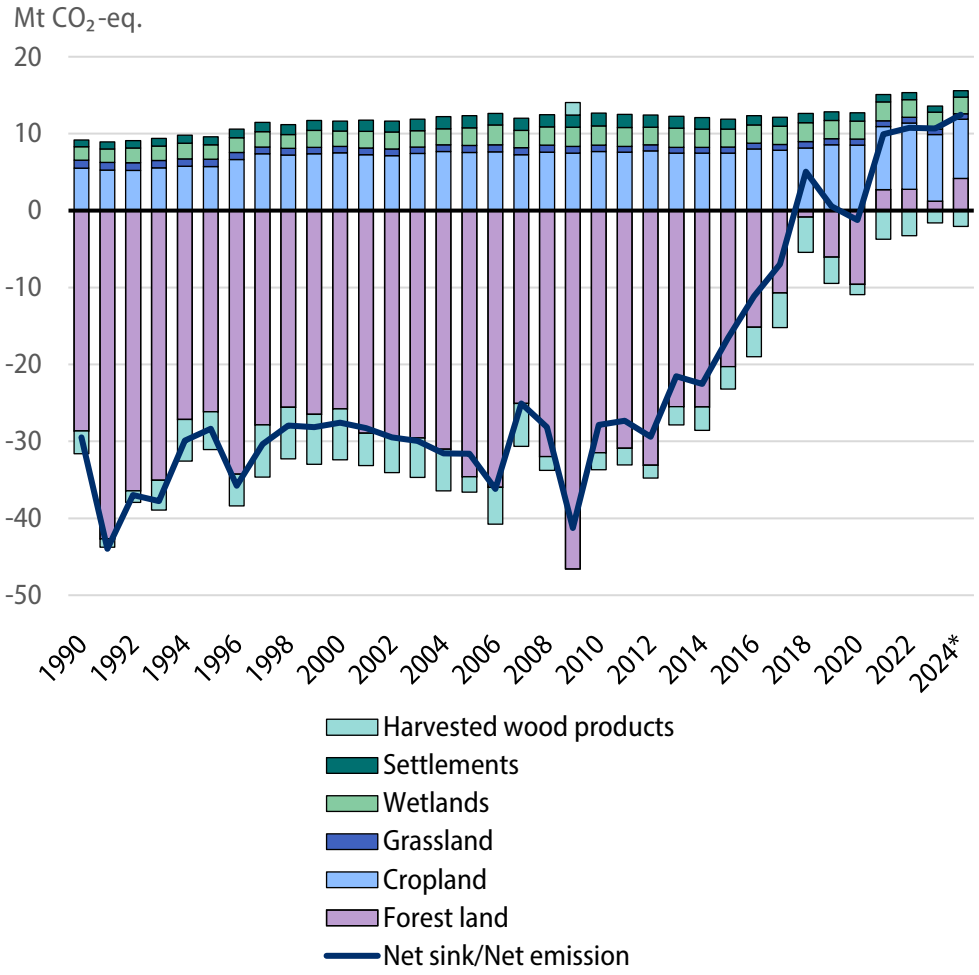
1. **Increase in harvesting levels.** Forest harvesting levels increased in the 2010s, leaving fewer trees to grow and sequester carbon. Around 90% of the increment of the growing stock is consumed by harvesting and natural drain, whereas the figure was only just over 70% as recently as in the early 2010s. At the same time, the gradual decline in timber imports from Russia since 2008 and their complete cessation in 2022 have also influenced the domestic demand for timber. A new forest planted after final felling will not sequester the same amount of carbon as was removed by harvesting for several decades or, in some cases, for more than a hundred years.
2. **Slowdown in tree growth.** In recent years, forests have grown less than before. According to studies, the reasons for the slowdown include the ageing of forests past their fastest growing stage, while drought and forest damage also reduce growth. The persistently high harvesting levels also contribute to the decline in forest growth. In particular, an increase in the intensity of forest thinnings causes a decrease in growth as the amount of unused growing space increases. At the same time, forest growth has slowed, especially as a result of ageing pine forests in northern Finland, where some forests have passed their fastest growing stage. The approach to forest growth in the National Forest Inventory has also changed, resulting in a change in growth estimates.

3. **Increase in soil emissions.** Carbon dioxide is released from forest soils when peat and other organic matter such as litter decompose. Accelerated decomposition and increased carbon dioxide emissions are due to global warming and forest management practices that have left less forest residues, such as harvesting residues. Soil emissions can be mitigated by avoiding drainage in peatland forests, blocking ditches and treating forests in a way that increases the amount of litter input to form soil carbon.

The most up-to-date scientific information is made available as the knowledge base and methods change. Changes may continue to occur in the future, but despite these changes, there is strong scientific evidence that increased forest harvesting reduces carbon sequestration, while global warming increases emissions from drained peatlands and has an impact on growing conditions in general and, consequently, on the emissions trends of the sector as a whole.

Proxy estimate data from Statistics Finland indicates that the LULUCF sector was a source of emissions of 13.5 million tonnes of CO_2 equivalent in 2024. The estimate of the sum of emissions and removals in the LULUCF sector, i.e. the size of the sector's carbon sink or source of emissions, will become more precise when the 2024 preliminary data is released. The preliminary data is compiled making use of updated data available on areas, growing stock, fertilisation and wildfires. The 2023 preliminary data released in January 2025 showed that the forest land use category had also become an emission source from 2021 onwards, as the tree sink is no longer sufficient to cover the increased emissions from forest soil.

Figure 5. Sums of emissions and removals by land use category in the LULUCF sector and the sector's aggregate emissions and removals (net sink/net emission) in 2000–2024. *The data for 2024 is proxy estimate data containing preliminary estimates for forest land, harvested wood products and cropland, whereas the data for the other land use categories corresponds to the previous year's figures.

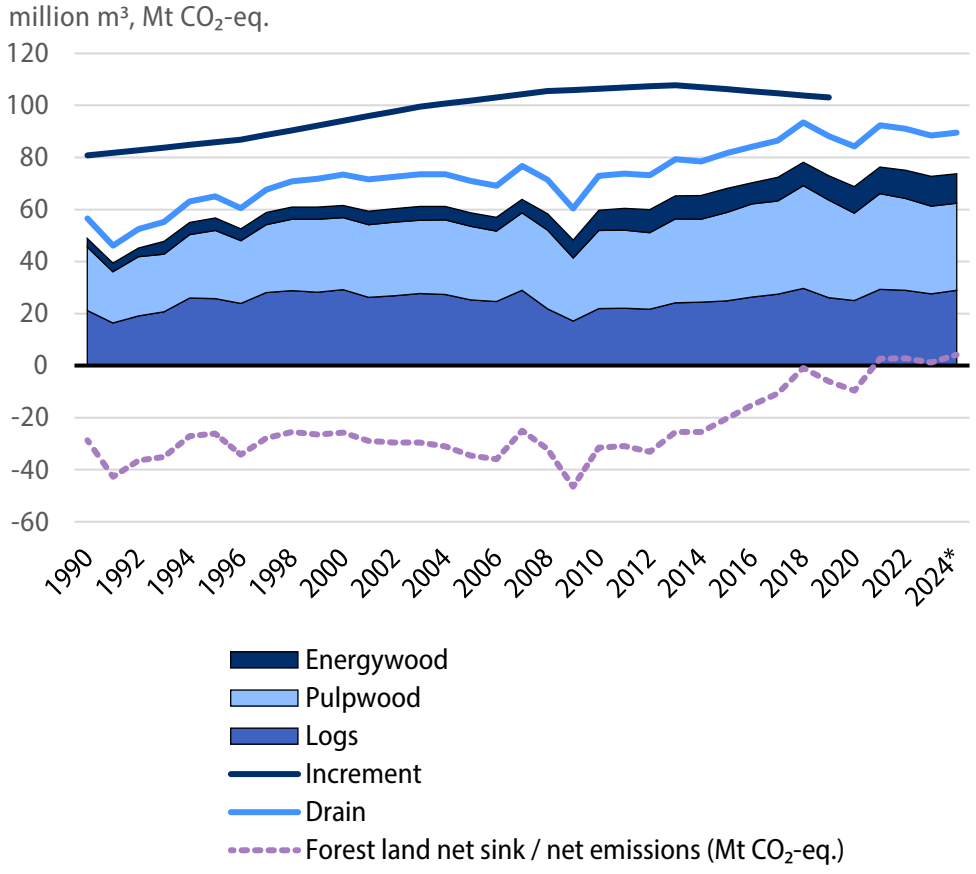


The greenhouse gas inventory uses the latest data on Finland's forest resources measured in 2019–2023 (NFI13). Changes in the carbon pool of forest land are also essentially affected by the drain of growing stock. According to data from the Natural Resources Institute Finland, the total volume of roundwood harvested in 2024 was 73.8 million cubic metres. Roundwood removals averaged 65.1 million cubic metres in the period from 2000 to 2024. According to 2024 data, a total of 62.1 million cubic metres of logs and pulpwood were harvested for industrial use and export.

Harvesting rates were one per cent above the average over the last five years. The amount of harvested energy wood was about 11.3 million cubic metres. Roundwood removals, i.e. the total amount of roundwood harvested for all uses, include not only commercial roundwood harvesting but also firewood for detached houses and household wood harvested for forest owners' own use.

This means that most of the wood that ends up in energy use is included in the roundwood removals, while harvesting residues and stumps are not. The total drain from Finnish forests in 2024 was 89.6 million cubic metres. Besides roundwood removals, this includes the roundwood left in forests as unrecovered harvesting residues and dead trees.

Figure 6. Roundwood removals by timber type, forest growth, total drain and net removals or emissions of forest land 1990–2024. *The 2024 data is instant preliminary data.



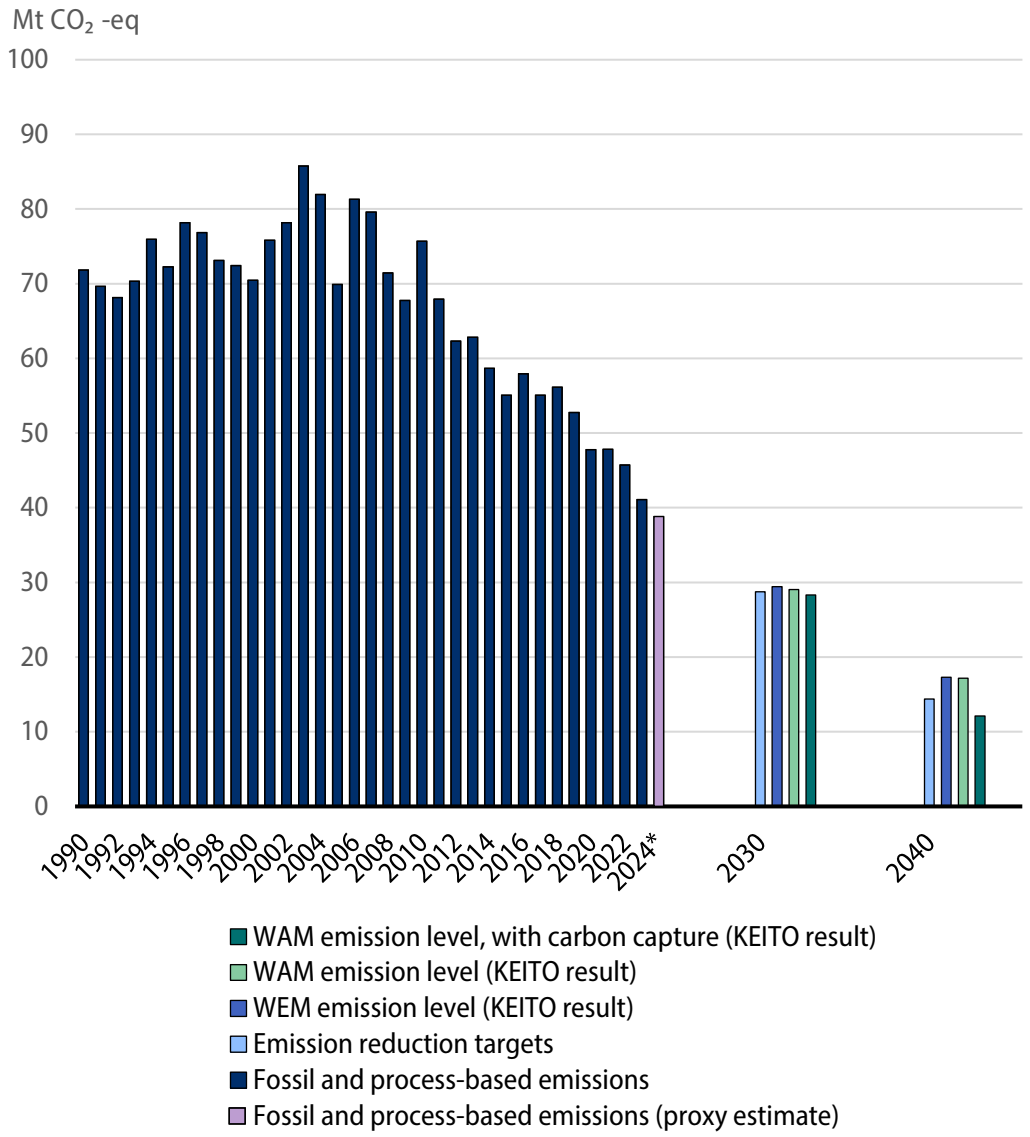
4 Achievement of targets

4.1 Climate Act targets for 2030, 2035 and 2040

The Climate Act (423/2022) sets out emission reduction targets for 2030, 2040 and 2050. The emission reduction targets are 60% by 2030, 80% by 2040 and 90% but aiming at 95% by 2050 compared with the 1990 levels. The act also includes a carbon neutrality target for 2035, which means that net emissions in Finland must be zero. In other words, greenhouse gas emissions must be no higher than the removals. The act includes a target to reduce emissions and increase removals by sinks to meet the carbon neutrality target by 2035 and beyond. The baseline scenario developed in the KEITO project in spring 2025 describes the impact of policy measures decided by spring 2023 on Finland's greenhouse gas emissions. The modelling made use of the assumptions recommended by the European Commission for trends in fuel prices on the world market and emission allowance prices. The assessment of the emissions trends achievable with existing measures was also affected by factors such as development in different industry sectors and the population projection.

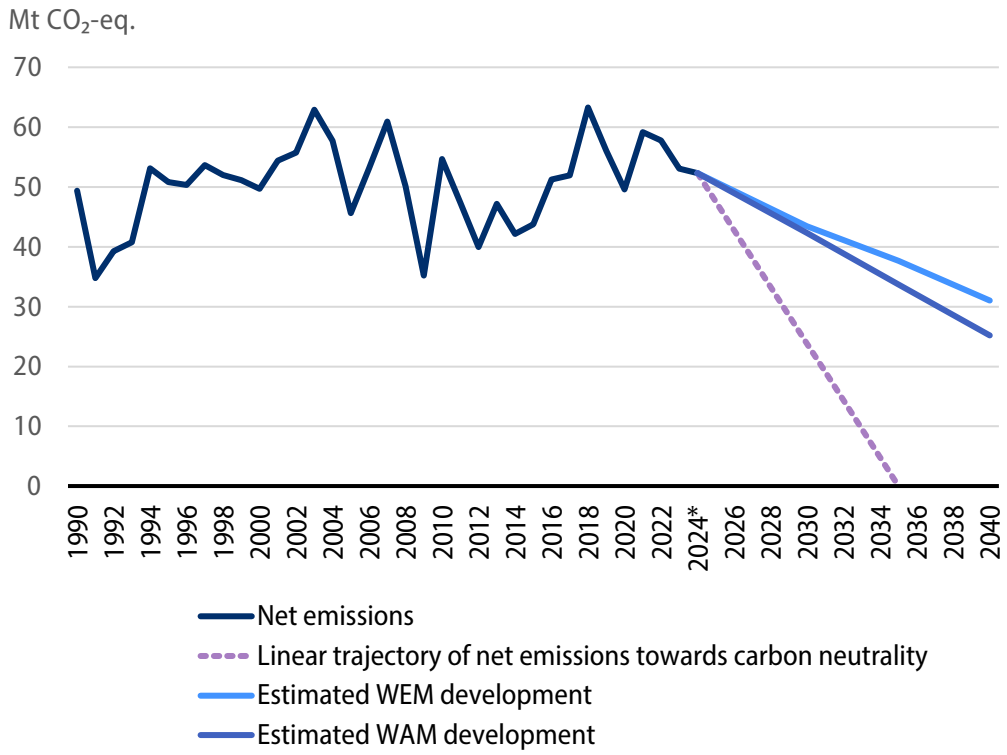
Figure 7 below shows the targets for 2030 and 2040 relative to current trends. The 60% reduction target will not be fully achieved by 2030 with existing measures; nor will existing measures be sufficient to reach the 2040 target. With additional measures, both the 2030 and the 2040 target will be met if carbon capture technologies are taken into account. Excluding these, the gap to the target will be 0.3 Mt CO_2-eq for 2030 and 2.8 Mt CO_2-eq for 2040.

Figure 7. Trends in fossil and process emissions (i.e. emissions excluding the LULUCF sector) in 1990–2024 and achievable emission levels under the baseline scenario with existing measures (WEM) and the policy scenario with additional measures (WAM). In this context, 'carbon capture' refers to the recovery of fossil, waste-based and bio-based carbon and the utilisation of carbon dioxide. *The 2024 data is proxy estimate data.



Achieving the carbon neutrality target means that removals equal emissions, resulting in total net emissions adding up to zero. Figure 8 below shows the actual net emissions trends in 1990–2024, the KEITO WEM trends and the linear trajectory from the current situation towards carbon neutrality in 2035. According to the baseline (KEITO WEM) scenario, net emissions in 2035 would be 38 Mt CO_2-eq., which is the amount by which emissions will fall short of the target. In the policy (WAM) scenario, net emissions in 2035 would amount to 34 Mt CO_2-eq. Forest harvesting levels have a significant impact on the net emission level in the LULUCF sector. Harvesting rates are at a high level (80–82 million m^3 per year) under both the baseline and the policy scenario.

Figure 8. Net emissions trends in 1990–2024, linear trajectory towards the 2035 carbon neutrality target and estimated emissions trends in 2025–2040 under the WEM and WAM scenarios. *The 2024 data is proxy estimate data.



Fact box: The role of technological carbon sinks in meeting climate targets

Climate targets require both emission reductions and the strengthening of carbon sinks. In addition to these, technical means are also needed to generate negative emissions. Technical means that include carbon capture, utilisation or storage have different climate impacts. Negative emissions can be produced by means such as permanent geological storage of captured carbon dioxide from biogenic source or directly from atmosphere. Captured carbon dioxide from biogenic source or directly from atmosphere can be used to replace the use of fossil raw materials or fuels and reduce emissions. The lifetime of products can vary, affecting the duration of carbon sequestration and, consequently, the climate impact of the measure. The emissions and removals associated with the whole value chain of storage or utilisation have an effect on the amount of negative emissions or emission reductions that can be achieved.

Under the Finnish Climate Act, the definition of sink also covers technological carbon sinks. The Climate Act allows for the inclusion of not only natural sinks but also potential technological sinks in the calculation of the net carbon sink. Technological sinks can therefore be used to achieve the 2035 carbon neutrality target. However, the Climate Act does not set targets for negative emissions, nor provide for the extent to which technological sinks can or should be used as part of climate policy.

The Climate Panel has estimated that, in the 2035 timeframe, technological sinks could have a potential of around 3 Mt CO_2-eq, but this would require effective economic incentives or the inclusion of technological sinks in the EU ETS. The Climate Panel estimates that this potential would be based on the capture and permanent storage of biogenic carbon dioxide, known as bioenergy with carbon capture and storage (BECCS), the cost of which around 2030 would vary between about EUR 120 and EUR 240, depending on the site of capture. The Panel projects that direct atmospheric carbon capture and storage (DACCS) would likely remain very costly by 2035, estimated at around EUR 500–1,000 per tonnes of CO_2, and is therefore not included in the estimate. According to the Climate Panel, investing in carbon utilisation rather than storage would reduce the estimated technological sink in the 2035 timeframe. At the same time, however, fuels made from

carbon dioxide and hydrogen, for example, would replace fossil fuels and could help Finland achieve emission reductions in the transport sector, provided that the products are used in Finland.

Technological sinks and the negative emissions they generate can´t be used for meeting EU´s climate commitments in the 2030 timeframe. However, according to Commission Communications published in February 2024 and their impact assessment, the role of technological sinks and biogenic and atmospheric carbon capture and utilisation in meeting climate targets would be significantly strengthened after 2030.

The EU Net-Zero Industry Act sets a target of at least 50 million tonnes of CO_2 injection capacity for geological storage per year by 2030. Modelling produced for the Commission Communication on Europe's 2040 climate target suggests that the amounts of CO_2 to be captured would amount to around 280 million tonnes by 2040 and around 450 million tonnes by 2050. The above figures include the capture, utilisation and storage of fossil, biogenic and atmospheric carbon dioxide. The share of biogenic and atmospheric carbon capture, storage and utilisation would increase significantly towards 2040 and 2050.

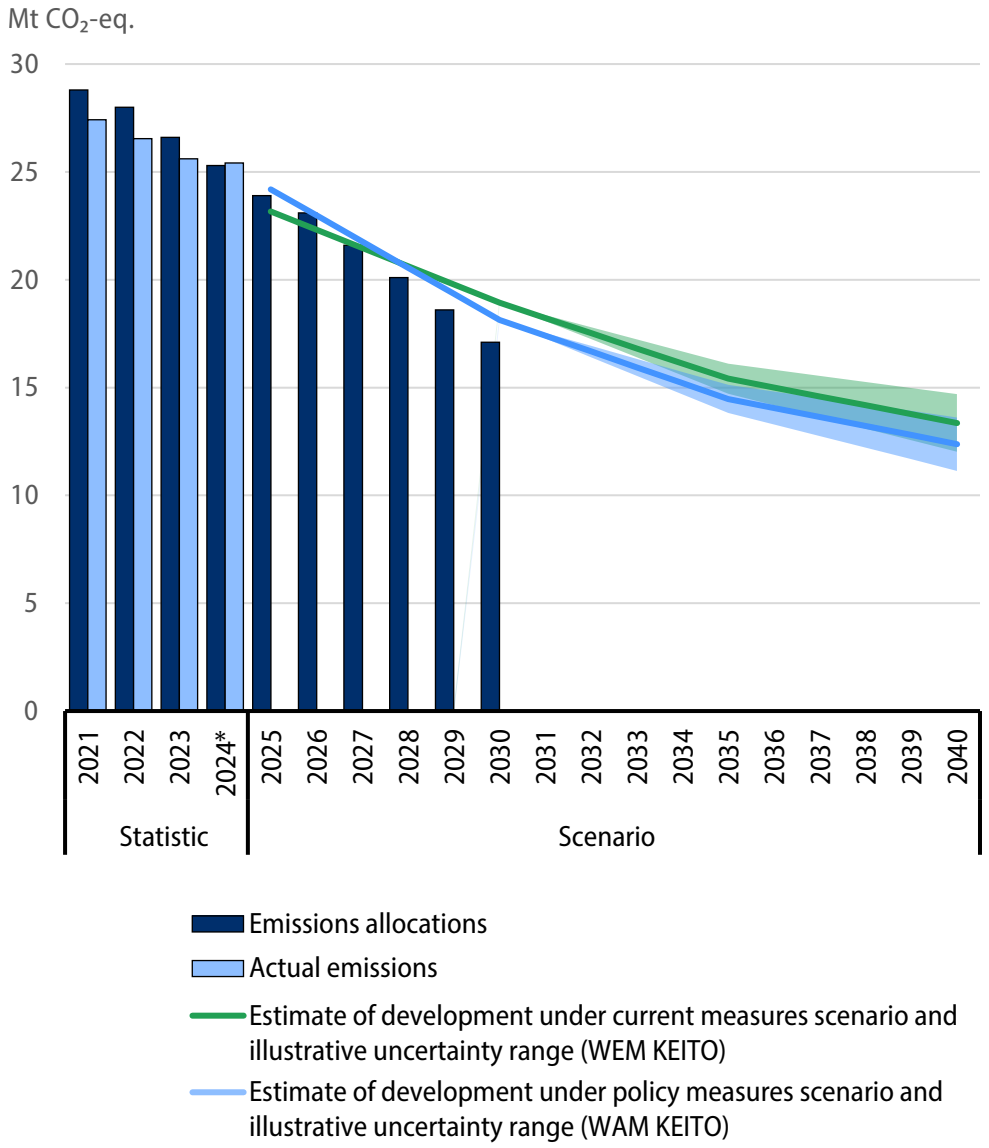
The development of the EU-level regulatory framework, incentives and frameworks (including infrastructure) will have a significant impact on the timeframe in which solutions based on biogenic and atmospheric carbon capture will become commercially viable industrial activities in Finland and the EU. Solutions based on carbon capture will also be addressed in the forthcoming Energy and Climate Strategy and Medium-term Climate Change Policy Plan. In addition, a legal framework is being drafted for cross-border CO_2 transport for permanent geological storage under the seabed.

4.2 Effort sharing sector obligation for 2021–2030

At the EU level, binding obligations have been set for all Member States in the effort sharing sector, consisting of an obligation to reduce emissions by a certain percentage by the 2030 target year and annual emission allocations (AEAs). The EU Effort Sharing Regulation sets for Finland the obligation to reduce emissions in the effort sharing sector by at least 50% by 2030 from 2005 levels. Commission Implementing Decision (EU) 2023/1319 sets out the annual emission allocations (AEAs) for all Member States for the period from 2021 to 2025. The annual allocations for the remaining period (2026–2030) will be decided by the end of 2025. These are also affected by the change in the scope of emissions trading for above 95% biomass installations. It is not yet clear what impact this will have on annual emission allocations for the effort sharing sector. At EU level, achievement of effort sharing obligations will be reviewed during 2027–2028 for the period from 2021 to 2025 and in 2032 for the 2026–2030 period. Figure 9 below shows an estimate of Finland's emission allocations for the whole period and the actual emissions trend for 2021–2024. This section discusses the achievement of the effort sharing sector obligation cumulatively and without linkage to the LULUCF sector.

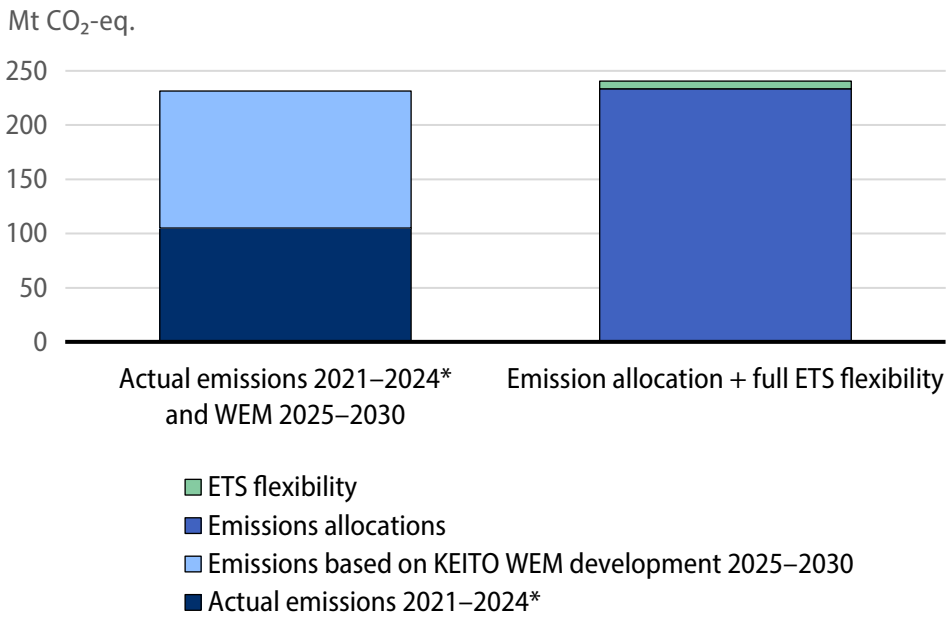
The adequacy of the current climate actions in the effort sharing sector is assessed by comparing the GHG emission levels according to the allocations under the EU Effort Sharing Regulation and the targets of the Climate Act with the baseline or WEM scenario (with existing measures) and the policy or WAM scenario (with additional measures). According to the baseline scenario, the emissions of the effort sharing sector will fall to 18.9 million tonnes of CO_2-eq in 2030 and further to 15.4 million tonnes in 2035 and 13.4 million tonnes in 2040 (Figure 9). To be in line with the -50% obligation proposed by the Commission for Finland, emissions should be 17.1 Mt CO_2-eq in 2030, which leaves a gap of 1.8 Mt between the existing measures and the obligation in 2030. The baseline scenario does not include any measures decided during the current government term that will increase emissions compared with previous legislation. The policy scenario with additional measures (WAM) will achieve 18.1 Mt CO_2-eq in 2030, leaving an emissions gap of 1 Mt CO_2-eq to the target level of 17.1 Mt CO_2-eq. The policy scenario will achieve a level of 12.5 Mt CO_2-eq in 2040.

Figure 9. Actual emissions in the effort sharing sector in 2021–2024, emission allocations in 2021–2030 (estimated for 2026–2030) and estimates and illustrative uncertainty intervals (+/-5% in 2030 and +/-10% in 2040) developed by the Ministry of the Environment on the basis of the KEITO scenarios for emissions trends in 2025–2040. *The 2024 data is proxy estimate data.



However, the obligation under the EU Effort Sharing Regulation is cumulative in nature and covers the whole 2021–2030 period. In addition, flexibility mechanisms under the Effort Sharing Regulation can be used to comply with the obligation. Therefore, exceeding the emission allocation for a single year does not pose a problem, as long as the obligation is met over the whole period. Figure 10 below presents the Ministry of the Environment's estimate of cumulative emissions trends in the WEM scenario relative to the 2021–2030 obligations. The figure shows that even if the 2030 target is not met with existing measures, the benefit from remaining below allocations in the early period may be sufficient to compensate for any allocation excesses later during the period. It is noteworthy that the 2021–2023 emission allocations were quantified for the previous 2030 target (a 39% reduction instead of 50%), which means that they do not correspond to the same emission reduction trajectory as the end-of-period allocations.

Figure 10. Ministry of the Environment estimate of cumulative emissions trends in the effort sharing sector based on KEITO WEM scenario data relative to 2021–2030 obligations. The WEM scenario does not include the previously decided measures that will increase transport emissions.



4.3 LULUCF sector commitments

Under the EU LULUCF Regulation covering land use, land use change and forestry, the commitments of the Member States are divided into two separate five-year commitment periods: 2021–2025 and 2026–2030. The scope of application for both periods covers the same sources of emissions and removals, but the commitments are considered differently. The commitment is based on accounting rules during the 2021–2025 period and on GHG inventory data reported during the 2026–2030 period.

During the 2021–2025 period, Member States must ensure that no accounted emissions arise from the LULUCF sector. The commitment is based on accounting rules concerning accounting categories. The accounted removals or emissions of forests are obtained by comparing the commitment period's actual removals to the determined reference level where the sink of harvested wood products is also taken into account. The reference level for forest land is based on the continuation of forestry practices from 2000–2009 and a projection for the development of forest and harvested wood product sinks obtained using this calculation. Emissions from cropland and grassland are accounted by comparing them with average emissions in the 2005–2009 period.

When the LULUCF Regulation entered into force, an annual reference level for forest carbon sinks was set for each Member State, which for Finland was -29.4 Mt CO_2-eq, including harvested wood products. Technical corrections to the reference level have been and are likely to be made at national level due to methodology changes in the GHG inventory. The Commission will adopt the final reference level in 2027. Emissions from deforestation and afforestation are accounted in full in the 2021–2025 commitment period.

According to an updated estimate by the Natural Resources Institute Finland, Finland would incur a deficit of 110–115 Mt CO_2-eq in the first commitment period. The estimate does not take into account the 2024 proxy estimate data. This figure has been calculated at the -19.3 Mt reference level, i.e. after technical corrections. If the forest land flexibility (22 Mt CO_2-eq) and Finland's country-specific flexibility (5 Mt CO_2-eq) were used, the final deficit would, in light of the current estimate, amount to 83–88 Mt CO_2-eq.

Final data on the size of the deficit will only be available in 2027, when the GHG inventory data for the last commitment year 2025 will be available. If the LULUCF sector generates net emissions in the 2021–2025 period, a Member State may purchase LULUCF units from another Member State that has exceeded its

commitment and wishes to sell its surplus units. If the LULUCF commitment is not reached by means of the units bought, the deficit is transferred to be covered by the effort sharing sector.

It is not known at this time whether any Member State will be selling LULUCF units. Like Finland, many EU Member States have reported challenges in meeting LULUCF commitments.

The target for the second commitment period consists of a common EU 2030 target, a 2030 target for each Member State and a cumulative 2026–2029 commitment for each Member State. For the 2026–2030 period, the LULUCF commitment is based on inventory data. Finland's net sink increase target for 2030 is set at -2.9 Mt CO_2-eq relative to the actual average sink for 2016–2018. According to the official inventory data published in spring 2025, the average sink for 2016–2018 was -0.9 Mt CO_2-eq. This means that the Finnish LULUCF sector's sink in 2030 should be at -3.8 Mt CO_2-eq. The commitment changes with the changes in the inventory figures.

The 2026–2029 target is defined through a linear emissions trajectory, i.e. annual limits. In practice, the Finnish LULUCF sector should not produce more than a total of 4.3 Mt CO_2-eq of net emissions between 2026 and 2029. According to 2023 preliminary data, the Finnish LULUCF sector was a source of emissions averaging 11.8 Mt CO_2-eq in 2021–2023. Consequently, a total gap of 42.5 Mt CO_2-eq from the current situation will need to be closed between 2026 and 2029 to meet the linear trajectory.

At national level, the 2022 Climate Plan for the Land Use Sector (MISU) has set a target of strengthening the net sink by at least 3 Mt CO_2-eq by 2035.

4.4 Need for additional action and preparation

Achieving the targets under the Climate Act

The rate of emission reductions in accordance with the available KEITO project's WEM baseline scenario falls just short of achieving the 60% emission reduction target set by the Climate Act for 2030. However, at around 0.7 Mt CO_2-eq, the difference to the target is small in terms of total emissions. The additional measures outlined under the KEITO WAM policy scenario would be sufficient to achieve the target, provided that solutions based on carbon capture are taken into account. Excluding carbon capture solutions, the KEITO WAM scenario falls short of the required emission level by 0.3 Mt.

Reaching the carbon neutrality target of the Climate Act requires that emissions do not exceed removals by 2035 at the latest. According to the KEITO policy scenario, the combined emissions of the effort sharing sector and emissions trading will decrease to 18.5 Mt CO_2-eq in 2035, provided that solutions based on carbon capture are taken into account. Excluding carbon capture solutions, emissions will amount to 21.4 Mt CO_2-eq.

The latest scientific knowledge and situational picture in the LULUCF sector have changed significantly in recent years, which is reflected in both historical trends and forward-looking scenarios. The deterioration in the LULUCF sector is mainly due to an increase in forest harvesting rates, a slowdown in tree growth and an increase in soil emissions (for more information, see the fact box in Section 3.4.). Today, around 90% of the increment of the growing stock is consumed by harvesting and natural drain, compared with just over 70% in the early 2010s. Technical and methodological corrections made to the GHG inventory affect the LULUCF sector's emissions and sinks retroactively. The latest field survey data has also significantly reduced estimates for tree biomass. The need for additional measures to achieve the 2035 carbon neutrality target under the current LULUCF sector policy scenario is of the order of up to 34 Mt, taking into account the emissions trend under the policy scenario. Based on the WEM scenarios, this gap is even wider.

The KEITO project also includes an alternative WEM scenario (WEM-low) for the LULUCF sector. It assumes that the sector's sink level would be around 1 Mt CO_2-eq in 2035, thus remaining a net sink. Under this scenario, the emissions gap to reach the carbon neutrality target would be at a level of around 20 Mt CO_2-eq. The main explanatory factor for the range of the WEM scenarios is the assumed harvesting level. In 2035, forest harvesting levels will be around 80–82 million cubic metres in the baseline scenario (WEM-baseline) and 70–71 million cubic metres in the alternative WEM scenario (WEM-low). For comparison, the average roundwood removal for 2019–2023 was around 73 million cubic metres. Achieving the carbon neutrality target requires additional measures in the LULUCF as well as other sectors.

The emissions trend based on the KEITO project's baseline scenario is insufficient to reach the 2040 emissions reduction target of the Climate Act. Instead, the policy scenario modelled in the KEITO project would be sufficient to achieve these targets. The difference between the scenarios is particularly affected by the increase in negative emissions after 2035. Therefore, the assessment of achievement of the targets depends on the emissions trends, the amount of negative emissions and their consideration as part of assessment of the achievement of the emission reduction targets.

Achieving the targets under EU legislation

Finland's compliance with EU commitments in the effort sharing and LULUCF sectors is discussed in Sections 4.2 and 4.3. While assessment involves a lot of uncertainty at this stage, it seems in any case that the availability of flexibility mechanisms will have a significant impact on the situation.

If the sink level set for Finland's LULUCF commitment is not met, it is possible for Finland to cover the deficit by acquiring an equivalent amount of LULUCF units from other Member States. If the deficit cannot be covered by means of acquiring LULUCF sector units, the deficit for the 2021–2025 period is transferred to be covered by the effort sharing sector's emission allocations. Due to the already ambitious effort sharing sector obligation and the magnitude of the deficit of the LULUCF sector, covering the deficit to any significant extent by means of additional measures in the effort sharing sector is practically impossible. If the deficit is transferred to the effort sharing sector, it is possible to meet the obligation by seeking to acquire the effort sharing sector's emission allocations from other Member States. There is currently no certain data on the availability or price of units/allocations of either sector. In addition, several Member States may need to acquire both effort sharing sector allocations and LULUCF units to meet their commitments.

Preparation of additional measures

Preparations are underway for the next Energy and Climate Strategy and Medium-term Climate Change Policy Plan (MTCP). As part of the strategy, an emission debt reduction programme will be drawn up in line with the Government Programme. The documents being prepared contain additional measures needed to meet the targets of the Climate Act and EU commitments. Both the strategy and the new MTCP are due to be submitted to Parliament in reports during 2025.

The measures of the effort sharing sector will be outlined in the new Medium-term Climate Change Policy Plan (MTCP3). They will not only help meet the targets of the Climate Act, but also ensure that the EU's effort sharing sector obligation will be met. The measures will be quantified on the basis of the scenarios developed in the KEITO project on future emissions trends and the decisions already made during the current government term that affect emissions trends. In spring/summer 2025, the Government will make the necessary decisions on the new measures to be included in the Medium-term Plan on the basis of official preparation. The premise is that new measures are needed to reduce emissions from sources such as transport, agriculture, non-road mobile machinery and heating. The new Medium-term Plan will look at emissions trends in the effort sharing sector up to 2040. However, the

focus will be on meeting the 2030 effort sharing sector obligation. At the same time, the plan takes into account the fact that the emissions performance in the effort sharing sector will support the achievement of the 2035 carbon neutrality target.

The number of additional measures required by climate policy targets and obligations will be assessed as a whole as part of drafting the new Energy and Climate Strategy. In this context, Finland may also take a stand on the acquisition of units/allocations from other Member States as a way of fulfilling its obligations set by the EU.

Under the Climate Act, the Annual Climate Report must assess the adequacy of the existing and planned measures presented in the climate policy plans with regard to the achievement of the targets set. The Annual Climate Report is not tasked with proposing additional measures.

5 Measures by sector and plan

5.1 Emissions trading sector (EU ETS1)

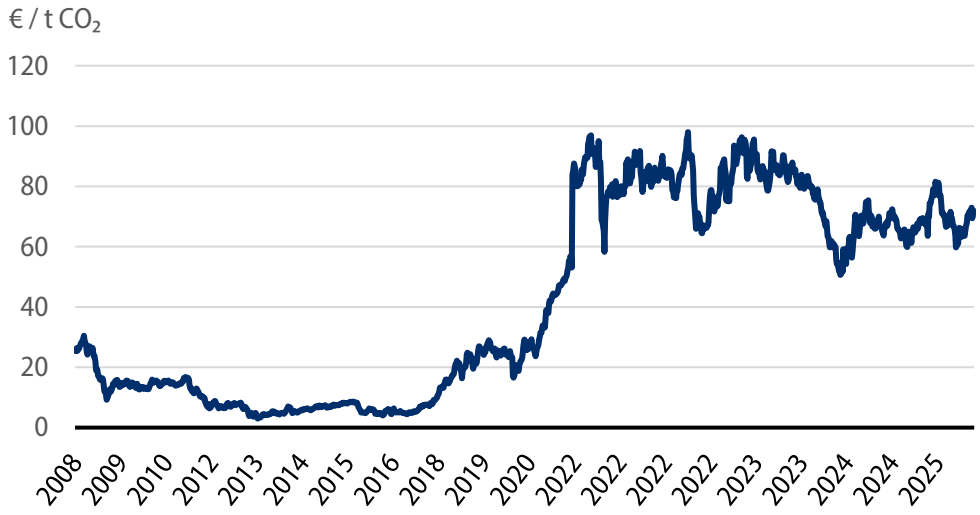
In the emissions trading sector, greenhouse gas emissions are primarily reduced by means of price controls created by the emissions trading system (EU ETS). The emissions trading system functions at the EU level and cannot be regulated at the national level. Emissions trends to date in the Finnish emissions trading sector are described in more detail in Section 3.2.

The EU ETS covers large-scale industrial installations, installations with a total thermal input exceeding 20 MW and smaller installations within the same district heating network. The emissions trading system applies to over 500 stationary installations in Finland. Emissions trading also covers aviation within the European Economic Area and, from 2024 onwards, intra-EEA maritime transport by ships of 5,000 gross tonnage or more and 50% of maritime transport between the EU and third countries.

Under the EU ETS Directive, installations using more than 95% sustainable biomass between 2019 and 2023 will be excluded from emissions trading from 2026 onwards. Emissions from the combustion of fossil fuels from the 80 or so installations that will be phased out of the EU ETS will be transferred from the emissions trading sector to the effort sharing sector. The total fossil emissions from installations exiting the ETS have been around 0.2 Mt CO_2 per year in 2019–2022.

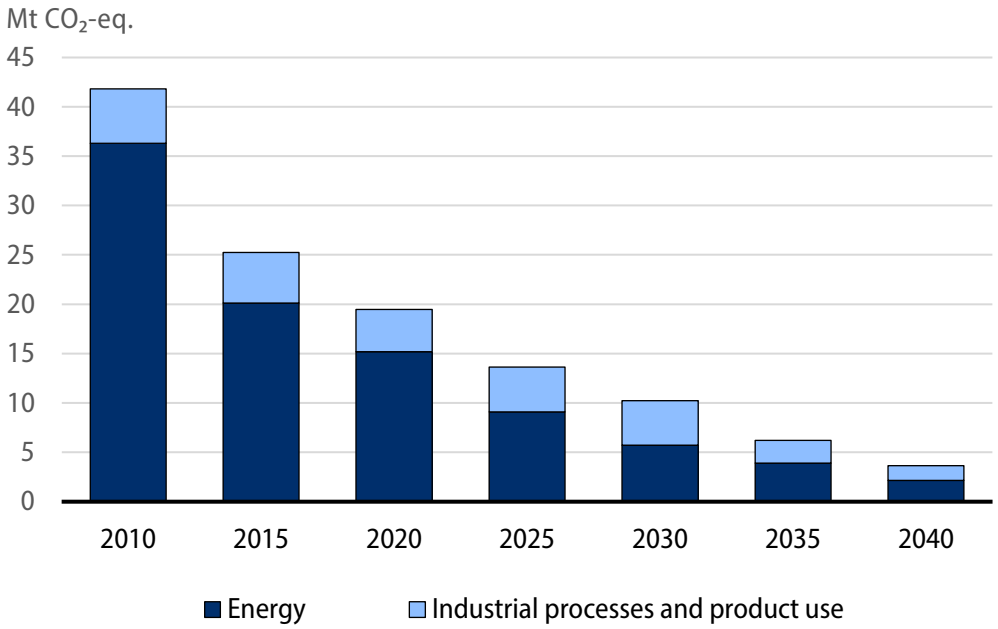
The emission allowance price has decreased since 2023, ranging between EUR 51 and EUR 75 per t CO_2 in 2024. As recently as in 2020, the emission allowance price did not exceed around EUR 30 per t CO_2. The price started to rise during 2021 and in spring 2023 it was at times close to EUR 100 per t CO_2.

Figure 11. Trend in emission allowance pricing in the general emissions trading system (EU ETS1) between 2008 and May 2025.



The total emissions of the Finnish ETS sector installations in 2024 were 13.3 Mt CO_2, equating to a 2.1 Mt CO_2 decrease from the previous year. Emissions are projected to continue to fall at a good pace in the coming years as well (Figure 12). Under the baseline scenario, without new policy measures, emissions will fall below half of current levels by 2035 and to around a quarter five years later. Depending on the accounting rules, carbon capture and utilisation or storage can significantly improve the sector's emissions performance, but the uptake of these technologies will require clarification of EU regulation and financial incentives or subsidies.

Figure 12. Trends in energy-related and industrial process emissions in the EU ETS sector in the KEITO WEM scenario within the current scope of emissions trading.



Alongside the EU ETS, Finland also has in place some national policy instruments that can influence emissions trends in ETS installations located in Finland. These include energy taxation, energy and other support, energy-efficiency measures and measures to phase out the use of coal in energy production. Installations falling within the scope of application of the emissions trading system are also within the energy tax system and subject to the same tax rates and rules as non-ETS entities.

The sectoral low-carbon roadmaps completed in 2020 were updated in 2023–2024. The roadmaps increase sectoral awareness of opportunities for and commitment to emissions reductions. For the central government, they provide valuable assessments of sectoral development, challenges and opportunities. The roadmaps have been used in the preparation of the Energy and Climate Strategy and the formulation of the Industrial Policy Strategy.

A separate electrification subsidy for energy-intensive industries introduced in 2022 may be granted retroactively for the period from 2021 to 2025. It has been agreed nationally that beneficiaries must use at least 50% of the support received for development measures that promote cuts in GHG emissions, increased efficiency in the use of energy, increased share of renewable energy, or electrification. In 2024, there were 55 subsidy decisions made and a total of EUR 143 million granted in

subsidies. The subsidy seeks to accelerate the reductions sought by industry low-carbon roadmaps. At the same time, the level of excise duty reimbursement for fossil fuels used by energy-intensive companies was gradually reduced over the 2021–2024 period, after which it was completely abolished.

In 2022, heat pumps and electric boilers for district heating or cooling, among other things, were moved to the lower electricity tax category II. This creates an incentive to electrify processes and production currently using fossil fuels and biofuels in industry and district heat production. In 2024, the amount of district heat produced with electric boilers doubled from 746 GWh to more than 1,538 GWh. The use of waste heat in district heat production has almost quintupled compared with 2010.

The Energy Authority manages and guides energy efficiency measures within the administrative branch of the Ministry of Economic Affairs and Employment, with the most important being energy efficiency agreements, energy audits, regional energy advisory services, as well as preparation of eco-design and energy labelling matters for specific product groups.

Energy efficiency agreements are a means jointly chosen by the central government and the participating sectors to meet the international energy efficiency obligations imposed on Finland. As of the beginning of March 2025, the agreements covered around 780 enterprises and their 7,591 sites as well as 164 municipalities or joint municipal authorities. Energy efficiency agreements are estimated to reduce emissions by 8.1 Mt CO_2 in 2025 and by 10.1 Mt CO_2 in 2040 compared with a no-agreement scenario. The vast majority of the emission reduction is estimated to be created in the EU ETS sector due to the high share of electricity and district heating in all energy savings. The energy efficiency measures that reduce electricity and district heat consumption will only have a small emission reduction impact in the future, as electricity and district heat production is now largely emission-free. In 2024, the share of zero-emission electricity in domestic production already reached 95%. Emissions from district heating are also showing a very positive trend: while ten years ago only a third of district heating was produced from zero emission energy sources, the 2024 share was already around 73%.

The Energy Efficiency Act (1429/2014) lays down the obligation for all large-scale enterprises to conduct an enterprise energy audit every four years to establish the enterprise's energy consumption profile and identify its energy-saving potential. The annual emission reduction impact of mandatory energy audits conducted since the end of 2015 is estimated to be 0.19 Mt CO_2 in 2025 and 0.16 Mt CO_2 in 2040 compared with a no-audit scenario. Most of the emission reductions relating to the mandatory audits are also within the scope of the EU ETS.

The Ministry of Economic Affairs and Employment and Business Finland may grant subsidies to projects to promote renewable energy production or use, energy savings or energy efficiency, or conversion into a low-carbon energy system by other means. The key objective of the subsidy is to reduce, in particular, the technical and economic risks associated with new technologies. Investment support for new energy technologies and large demonstration projects has been granted to projects pursuing future energy solutions with a budget of more than EUR 5 million that contribute towards the achievement of the national and EU targets set for 2030. The support is granted by Business Finland for projects with eligible investment costs of up to EUR 5 million and by the Ministry of Economic Affairs and Employment for larger projects. In 2024, a total of around EUR 101.8 million was granted in energy subsidies. The amounts awarded were around EUR 83.8 million for renewable energy projects, EUR 7.1 million for energy efficiency projects and EUR 10.9 million for other projects (energy storage and carbon capture). The largest share of the total amount of subsidy, about EUR 92.7 million, was allocated to large demonstration projects.

In addition, Finland has in place a Sustainable Growth Programme, which is Finland's plan for the use of the EU Recovery and Resilience Facility (RRF) funding. In the programme, Finland has allocated a total of around EUR 695 million to the green transition, including RDI supporting the green transition, energy system projects and industry's low-carbon and circular economy projects. The amount also includes the smaller RRF energy investment support, which is used in particular for demonstrating new solutions. In 2024, the support decisions made concerning renewable energy granted around EUR 91.1 million in funding. Of this, EUR 31.1 million went to new energy technology projects, EUR 35.4 million to energy infrastructure and electrification projects and EUR 24.6 million to other clean energy solutions.

The Act on the Prohibition of the Use of Coal in Energy Production (416/2019) adopted in 2019 basically applies to energy production installations operating within the emissions trading system. The prohibition will enter into force on 1 May 2029. The use of coal has declined rapidly in recent years, promoted by the investment support for coal substitution energy projects, which was granted to seven projects in 2020–2021. By spring 2025, all installations that previously used coal for energy production have either been closed or converted to use substitute fuels.

The Act on Offshore Wind Power in the Exclusive Economic Zone (937/2024) entered into force in December 2024. The act will help promote offshore wind power in the Exclusive Economic Zone, clarify the regulation of offshore wind power

projects within the zone and ensure that the rights to the exploitation of offshore wind power are granted in a fair, transparent and predictable manner. Offshore wind power can significantly increase the supply of emission-free electricity, thus accelerating the electrification of society and the replacement of emission-generating energy sources and technologies.

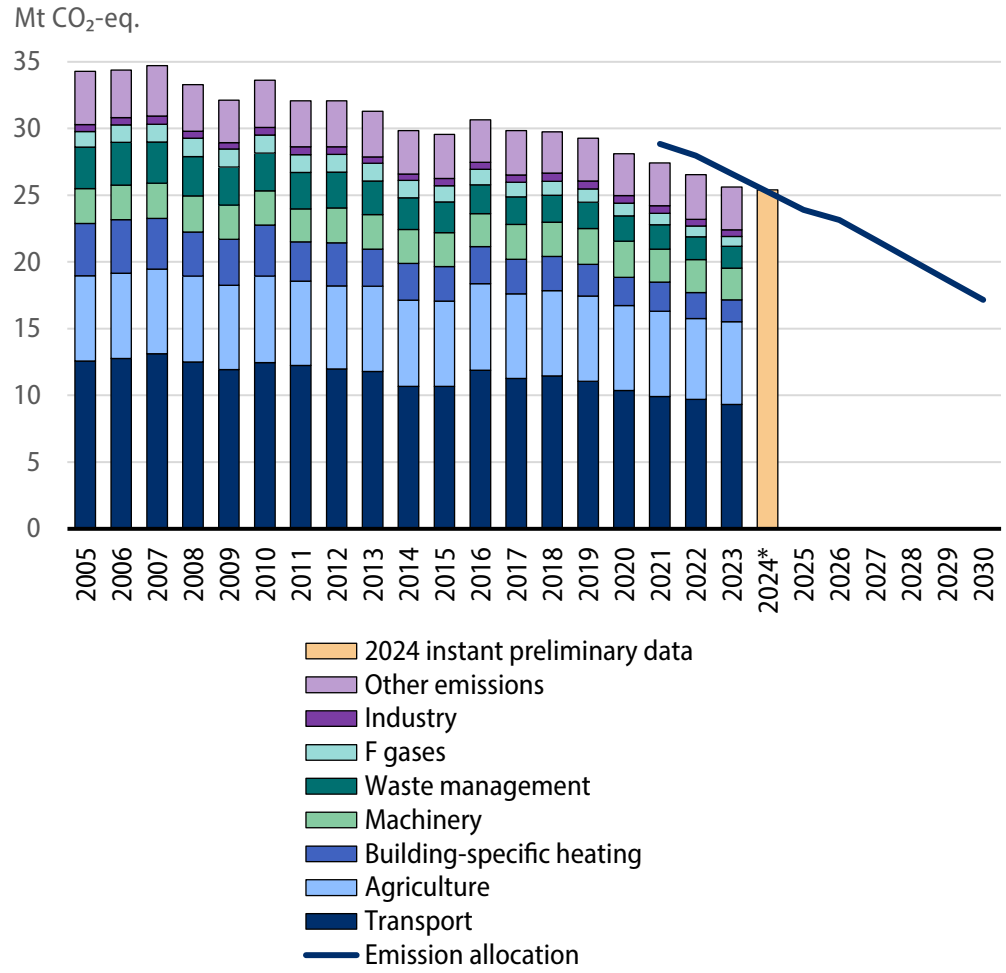
Table 2. EU ETS sector and certain non-ETS energy-related emissions – key policy measures in place.

Policy measure	Implementation status
Discontinuing the use of coal in energy production	Implemented. The Act on the Prohibition of the Use of Coal in Energy Production entered into force in April 2019. The act bans coal use in energy production from May 2029 onwards.
Abolishment of the energy tax refund for energy intensive companies	Partially implemented. The act entered into force at the end of 2020. The partial refund of the energy content tax on fossil fuels was phased out over 2021–2024.
Moving heat pumps producing district heat or cooling, other heat pumps of sufficient size and some data centres under electricity tax category II	Implemented. The change entered into force in 2022.
Energy efficiency agreements	Implemented. The 2017–2025 agreement period is underway. The agreements cover more than 780 enterprises and their 7,591 sites as well as more than 164 municipalities/joint municipal authorities.
Sustainable Growth Programme for Finland	Partially implemented. The first call for funding applications was opened in 2021 and the last one in spring 2024. The financial instrument is nearing its end, with projects due to be completed by June 2026. Supports, for example, green transition RDI projects and low-carbon and circular economy projects.
Energy subsidy	Implemented. A form of support available until further notice. Supports the green transition in the energy sector, such as increasing the use of renewable energy.
Sectoral low-carbon roadmaps	Implemented. The updated roadmaps were completed in 2024. Contain measures to reduce emissions from different sectors.

5.2 Medium-term Climate Change Policy Plan

The Climate Act requires the Government to draw up and adopt a Medium-term Climate Change Policy Plan (MTCP) once a parliamentary term. It describes the emission reduction targets and the measures to achieve them for the effort sharing sector. The effort sharing sector includes fossil and process emissions that are not covered by EU-wide emissions trading (EU ETS) for installations or by the land use, land use change and forestry (LULUCF) sector. In practice, emissions from the effort sharing sector consist of transport (excl. aviation), methane and nitrous oxide emissions from agriculture (CH_4 and N_2O), building-specific heating, non-road mobile machinery, F-gases, waste incineration, waste treatment and industrial emissions not covered by emissions trading. The figure below shows emissions trends from 2005 to 2024 and emission allocations for the effort sharing sector from 2021 to 2030.

Figure 13. Emissions trends in the effort sharing sector by emission category and an estimate of annual emission allocations for the effort sharing sector for 2021–2030. *The 2024 data is proxy estimate data.

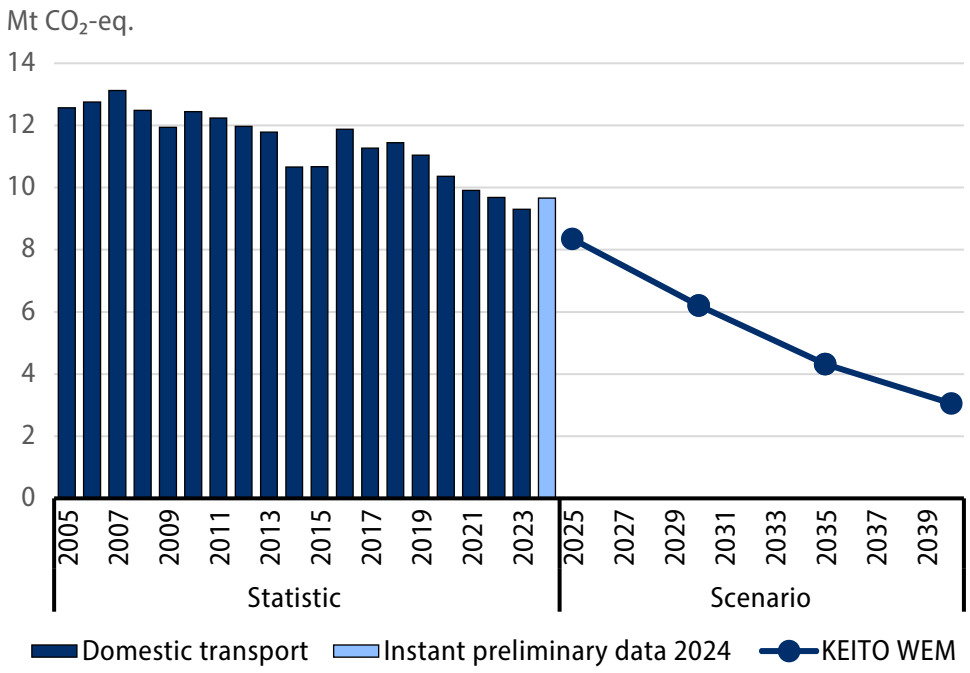


The following subsections provide sector-specific situational pictures, current developments and the implementation of the 2022 Medium-term Climate Change Policy Plan (MTCP2). A summary of the implementation of the main MTCP2 measures can be found in Appendix 4.

5.2.1 Transport

GHG emissions from domestic transport, excluding CO_2 emissions from domestic aviation, are accounted for in the effort sharing sector. According to Statistics Finland's instant preliminary data, GHG emissions from transport within the effort sharing sector totalled around 9.7 Mt CO_2-eq in 2024. The 2023 emissions stood at about 9.3 Mt CO_2-eq. In 2023–2024, emissions increased by around four per cent (see Figure 14).

Figure 14. Emissions from domestic transport (excl. CO_2 emissions from domestic aviation) in 2005–2024 and an estimate for 2025–2040 based on the baseline (WEM) scenario. The WEM scenario does not include measures decided after 1 April 2023 that will have an impact on transport emissions, as these are included in the WAM scenario. The 2024 data is proxy estimate data.



With the exception of 2024, the transport emissions trend was in line with the trajectory provided by the baseline (PEIKKO WEM-B) projection, which would lead steadily to transport emissions halving in 2030. The increase in emissions from transport in 2024 was driven by policy measures, in particular by the decrease in the amount of distributed biofuel. This was influenced by biofuel distributors exceeding their obligation in 2023, which meant that less biofuel needed to be distributed in 2024 to meet the obligation.

Below is a review of the MTCP2 targets and 2024–2025 trends for transport propulsion systems, vehicle fleet and transport performance. These elements can be used to monitor the progress towards the transport emissions target (50% emission reduction by 2030 compared with 2005 emissions). If all sub-targets are met, the emissions target will also be achieved.

Different transport propulsion systems

The MTCP2 sets a target of almost halving fossil fuel consumption in transport by 2030 compared with 2005.

The consumption of fossil petrol and diesel in transport has generally decreased in recent years as transport performance growth has been slowing, the energy efficiency of new vehicles has improved and the share of renewable energy has been increasing (see Figure 29 in Appendix 3). The use of fossil petrol and fossil diesel in transport has decreased by about 41% and about 10%, respectively, from 2005 to 2023.

Replacing fossil fuels with electricity, hydrogen or biomethane requires a nationwide distribution network for these energy sources. The charging infrastructure for electric cars and vans has developed favourably in Finland, and major steps have been taken to meet the requirements of the Alternative Fuel Infrastructure Regulation (AFIR) (see Figure 34 in Appendix 3). The charging infrastructure for heavy-duty road transport is still mainly private and the number of public charging stations is small (see Figure 35 in Appendix 3). More biomethane distribution stations have been built in recent years, but there is still room for improvement, especially for liquefied biomethane. There are currently no hydrogen stations in Finland. In addition to meeting the AFIR requirements, vehicles need adequate distribution infrastructure for alternative fuels along the main routes outside the TEN-T network.

Vehicle fleet

The Medium-term Climate Change Policy Plan (MTCP2) set the objective of growing the share of new zero-emission and low-emission technologies in new passenger cars sold to as close to 100% as possible by 2030. According to the MTCP2, there should be around 750,000 electrically powered passenger cars, with at least half of these fully electric ones, in circulation in 2030. The target for gas-powered cars is around 130,000 vehicles. The target for heavy-duty vehicles is around 4,600 electrically powered and around 6,200 gas-powered lorries, buses and coaches. According to Statistics Finland, there were about seven million vehicles in the Finnish vehicle register as at year-end 2024, of which about five million were in traffic use. The number of passenger cars in traffic use in 2024 was 2.8 million, of which 120,000, or 4%, were fully electric. The average age of passenger cars in 2024 was 13.6 years. The average age of cars has increased in recent years as the number of first registrations has remained low.

The electrification of passenger car transport in Finland has progressed fairly well. A total of 285,145 electric cars were in traffic use at the end of 2024 (218,868 in 2023), including 118,297 fully electric cars and 159,381 plug-in hybrids. The number of gas cars at year-end 2024 was around 16,642 (16,390 in 2023). The total number of hydrogen cars was two in both 2023 and 2024. Overall, electric and gas cars accounted for about 11.1% of passenger cars in traffic use in Finland at year-end 2024 (about 8.5% in 2023).

Fully electric cars and plug-in hybrids accounted for 29.5% and about 20%, respectively, of new passenger car registrations in 2024. In total, plug-in hybrids accounted for around 49.5% of all first registrations. This share decreased slightly from the previous year, reaching almost 55% in 2023. By contrast, the share of electric cars in second-hand car imports increased, reaching a remarkably high level of around 76% in 2024. Almost 33,000 used electric cars were imported into Finland and a total of 36,732 new electric cars were sold in 2024. Imports of used electric cars offset some of the decline in new electric car sales, but without a pick-up in new car sales, the MTCP2 electric car target risks not being met.

Gas cars accounted for around 0.2% of new passenger car registrations in 2024, with 114 cars registered for the first time. It appears highly unlikely that the gas car target will be reached, due to decisions made by several car manufacturers to phase out the production of gas-powered vehicles. The new baseline scenario (PEIKKO WEM-B) for GHG emissions from transport assumes that an increase in sales of new electric cars would compensate for a decrease in sales of gas cars. The WEM-B scenario projects that there will already be around 925,000 electric cars in 2030. This number of electric cars is not achievable with the current level of first registrations.

Electricity and gas shares are also increasing in the lorry segment, although the numbers of electric and gas vehicles are still small. Electric and gas-powered vehicles accounted for around 7.1% of first-time registered lorries at year-end 2024 (3.6% in 2023). Electrically powered lorries accounted for around 1.9% (1% in 2023) and gas-powered lorries for around 5.3% (2.5% in 2023). In total 64 electric lorries and 182 gas-powered lorries were registered. A total of 320 electric and gas-powered buses and coaches were registered in 2024 (319 electric buses and coaches and one gas-powered bus). Electricity accounted for a relatively high 57% of all first registrations of buses and coaches. However, meeting the MTCP2 targets for lorries, buses and coaches would require significantly higher first registrations of electric and gas-powered lorries.

Transport performance or kilometres driven

The 2022 Medium-term Climate Change Policy Plan (MTCP2) sets the objective of passenger car performance, i.e. the kilometres driven by passenger cars, no longer increasing in the 2020s. If people's mobility needs still grow in Finland, the aim is to direct the growth to sustainable modes in urban regions and inter-urban transport.

According to Statistics Finland, the total number of kilometres driven in 2024 on Finnish roads was 47 billion kilometres, almost the same as in 2023. The transport performance of lorries decreased by about 2%. Road traffic volumes increased on highways by 0.1% but decreased on streets and private roads by 0.2%.

The share of private passenger cars in all domestic trips is quite high. According to the autumn 2023 National Travel Survey, around 55% of all domestic trips were made by passenger car (either as driver or passenger). The second most common mode was walking, accounting for 23% of trips. Public transport accounted for 10% and cycling for 9% of trips made. The biggest change in mode share compared to autumn 2022 was a decrease of two percentage points in the share of trips made by passenger car as driver.

Table 3. Transport – key policy measures in place.

Policy measure	Implementation status
Promoting the use of renewable fuels in transport (Distribution Obligation Act)	Implemented. (Although amended as of 1 April 2023. In the baseline scenario, the distribution obligation is in line with the legislation in force before 1 April 2023.)
National distribution infrastructure plan	Implemented.
Support for distribution infrastructure	Implemented.
Purchase subsidy for fully electric passenger cars	Partially implemented. (The subsidy programme ended at year-end 2022. The subsidy is included in the baseline scenario for transport GHG emissions on a funding-equivalent basis.)
Conversion subsidy for ethanol and methane	Partially implemented. (The subsidy programme ended at year-end 2022 and the new programme ran up until year-end 2024. The subsidy in force before 1 April 2023 has been taken into account in the baseline scenario for transport GHG emissions on a funding-equivalent basis. The conversion subsidy in force at year-end 2024 is taken into account in the policy scenario.)
Tax benefit for zero-emission company cars	Implemented. (It was decided in spring 2024 to extend the benefit until 2029.)
Purchase subsidy for electric and gas-powered vans	Partially implemented. (The subsidy programme ended at year-end 2024.)
Subsidy for purchasing electric and gas-powered lorries	Partially implemented. (The subsidy programme ended at year-end 2024, funding was already fully committed in August 2024.)
Promoting remote work	Implemented.
HCT and logistics digitalisation	Implemented.
Transport system plans of urban regions	Partially implemented (not all projects in urban regions have received funding).
Public transport subsidies in large and medium-sized urban regions	Partially implemented (with significantly lower amounts than the target level).

Policy measure	Implementation status
Investment programme on walking and cycling	Partially implemented (with significantly lower amounts than the target level).
CO_2 limits for newly registered cars and vans (and AFIR)	Implemented.
CO_2 limit values for heavy-duty vehicles	Implemented.
Clean Vehicles Directive and Act	Implemented.
Emissions trading for fossil fuel distribution	Implemented. (Emissions trading to start in 2027.)

Act on Promoting the Use of Biofuels in Transport

The Act on Promoting the Use of Biofuels in Transport (446/2007), commonly known as the 'Distribution Obligation Act', is the most important measure affecting the use of renewable energy and the overall emissions trend in transport. The Distribution Obligation Act was amended towards the end of 2024 in line with the Programme of Prime Minister Orpo's Government, such that the level will be 16.5% in 2025 (29% under the previous legislation), 19.5% in 2026 (29%) and 22.5% (30%) in 2027. In the same context, the Distribution Obligation Act was supplemented with a so-called flexibility mechanism and the possibility to also fulfil the obligation with renewable transport electricity. The amendments entered into force on 1 January 2025.

The flexibility mechanism has the potential to replace a maximum of 5.5 percentage points of renewable fuel distribution to transport by 2030. Transport electricity, in turn, is estimated to replace around four percentage points of renewable fuels. Both reforms therefore reduce the supply of renewable fuel for transport (compared with the baseline projection). With one percentage point in the distribution obligation currently corresponding to roughly 0.1 Mt of emissions from transport, these changes could increase transport emissions by almost 1 million tonnes in 2030 (compared with the baseline scenario for transport GHG emissions).

The cost-effectiveness of the distribution obligation has been assessed in many different projects in recent years. A 2024 AFRY estimate projects that the cost-effectiveness of the distribution obligation would be around EUR 328 per tonne for

the general obligation and around EUR 547 per tonne for the additional obligation. According to a rough estimate made by the Transport Research Centre Verne in 2023, the cost-effectiveness of the distribution obligation would be around EUR 128–220 per tonne. This estimate also takes into account the impact of the distribution obligation on fuel prices and its effect on the car fleet and transport performance.

Support for distribution infrastructure

In 2024, the Ministry of Economic Affairs and Employment drafted a decree amending the Government Decree on Infrastructure Support for Electric Transport, Biogas and Renewable Hydrogen in 2022–2025 (178/2022), also known as the Distribution Infrastructure Decree. From now on, support will only be targeted to recharging pools for heavy-duty vehicles and to liquefied renewable gas refuelling stations, as well as to hydrogen refuelling stations for all types of vehicles. The changes will shift the focus of support from passenger cars to heavy-duty vehicles.

In the 2024 Budget, a grant authorisation of EUR 10 million was earmarked for distribution infrastructure support. In 2025, a total of EUR 6.67 million was available for the support programme.

The cost-effectiveness of distribution subsidies was estimated in 2020 using the system-dynamic model of VTT Technical Research Centre of Finland. It is estimated that the amount of support at the time (EUR 5.5 million) would have resulted in a reduction of around 0.01–0.02 Mt of emissions, making the cost-effectiveness of the support (based on the cost to central government finances alone) in the range of EUR 27.5–55 per t CO_2.

Conversion subsidies

In spring 2024, the Ministry of Transport and Communications drafted a legislative proposal to amend the Act on Fixed-Term Subsidies for the Purchase of Vehicles Powered by Alternative Fuels. The legislative proposal made it possible to apply for a subsidy for the conversion of a petrol car to be powered by either gas or ethanol. The law entered into force in August 2024, and it was possible to apply for conversion subsidy until 15 December 2024. The funds available for these totalled about EUR 2 million. However, most of the money remained unspent, as few applications for conversion subsidies were received.

According to a 2024 estimate by Finnish Transport and Communications Agency Traficom, the cost-effectiveness of conversion subsidies will be around EUR 48 per tonne for ethanol conversions and around EUR 88 per tonne for gas conversions.

As part of the overall fuel sales package, conversions do not in practice reduce greenhouse gas emissions from transport. This is because the renewable fuel separately filled into converted vehicles reduces the share of renewable fractions in other fuel sales by an equivalent amount.

Extension of the tax benefit for fully electric company cars

Finland has had a tax benefit in place for fully electric company cars since the beginning of 2021 and for low-emission company cars since the beginning of 2022, which have been included in the Income Tax Act. The taxable value of fully electric company cars and cars emitting less than 100 g/km will be reduced by EUR 170 and by EUR 85 per month, respectively.

Under the original amendment to the Income Tax Act, the tax benefits were in force until the end of 2025. In 2024, the tax benefit for fully electric cars was extended until the end of 2029, whereas the tax benefit for low-emission company cars will expire at the end of 2025.

The automotive industry estimates that the tax benefit for zero-emission company cars will result in an emission reduction of around 0.01 Mt in 2030, and a cumulative reduction of around 0.07 Mt between 2025 and 2030. The cost-effectiveness of the measure is around EUR 27 per t CO_2.

Purchase subsidies for lorries

There has been a purchase subsidy for gas-powered lorries in Finland since December 2020 and a purchase subsidy for electrically powered lorries since the beginning of 2022. From the beginning of 2023, a subsidy has also been available for the purchase of hydrogen-powered lorries. A total of EUR 6 million was reserved for subsidies for lorries for 2022–2023. No new appropriations were allocated to subsidies for 2024, but some of the 2022–2023 budget was still unused at the beginning of 2024. The appropriations were exhausted in August 2024.

In 2023, the Transport Research Centre Verne estimated the cost-effectiveness of purchase subsidies for electric lorries at -113 EUR per tonne and for biogas lorries at -246 EUR per tonne, meaning that the measure produced cost savings for society as a whole. The calculation took into account not only the costs to the central government finances, but also the costs and savings for transport companies and purchasers of transport services.

Promoting sustainable transport in urban regions

The land use, housing and transport (MAL) agreements between the Helsinki, Tampere, Turku, Oulu, Jyväskylä, Lahti and Kuopio urban regions and central government were signed in December 2024. Through the MAL agreements the central government and municipalities within urban regions promote a sustainable and low-emission community structure and transport system and related infrastructure investments, as well as statutory land use planning for and production of housing to meet people's needs.

According to an estimate produced by Traficom in autumn 2024, the transport-related measures in the agreements will result in a reduction of around 0.006 Mt of emissions by 2030. The agreements will also promote sustainable urban development, which will increase opportunities for sustainable mobility. Neither the road projects included in the agreements nor the cost-effectiveness of the agreements were included in Traficom's estimate.

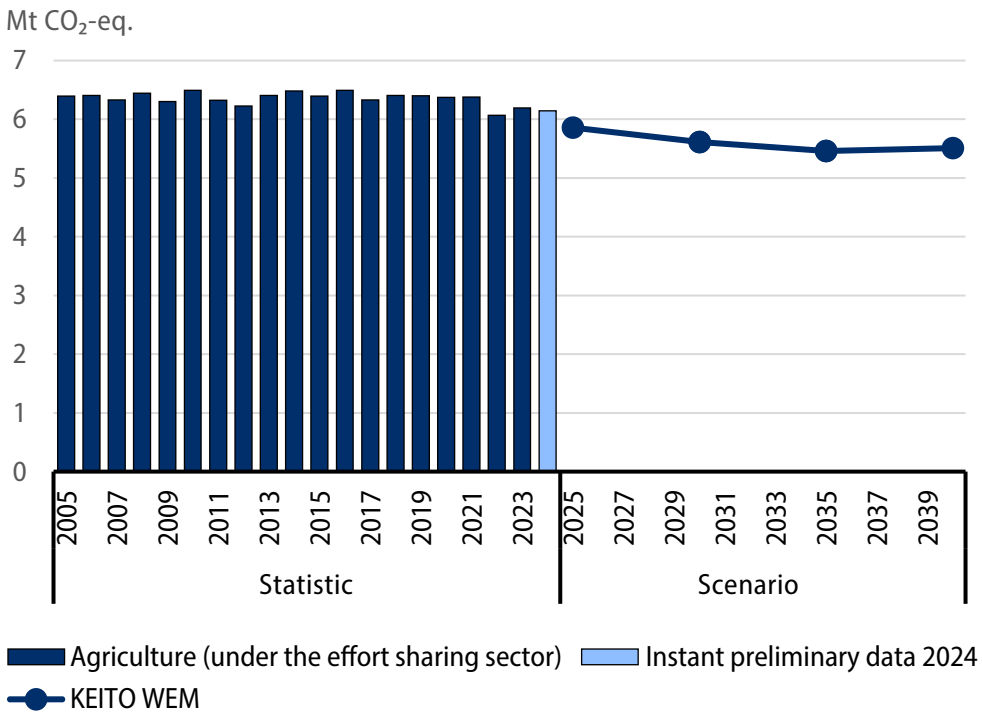
The central government can also promote sustainable transport in urban regions through government grants for public transport and for walking and cycling. The updated Transport 12 plan will include the estimated appropriations for development of the transport system (incl. grants for public transport and for walking and cycling) for the 2026–2037 period. The Funding Plan will be adopted at the same time as the current General Government Fiscal Plan. In line with the guidelines outlined in the Programme of PM Orpo's Government, public transport subsidies have been reduced by around EUR 13 million per year (climate-based public transport subsidy). The level of grants for walking and cycling will also be reduced by around EUR 6 million over the government term.

5.2.2 Agriculture

Greenhouse gas (GHG) emissions from agriculture are reported in several inventory reporting sectors. The effort sharing sector covers methane and nitrogen oxide emissions from agriculture, mostly from livestock, manure and soil, as well as carbon dioxide emissions from liming. Small quantities of emissions are also generated from urea fertilisation. Carbon dioxide emissions from cropland and grassland are reported in the land use sector (LULUCF). Furthermore, emissions reported in the effort sharing sector also include those from the use of fuels in agricultural machinery, building-specific heating and grain dryers.

With regard to agriculture, it is worth noting that it is not only a source of GHG emissions but also one of the few sectors alongside forests capable of removing carbon from the atmosphere and sequestering it in soil. This can be made possible by favourable agricultural practices, such as winter plant cover, perennial grass and reduced tillage. Emissions from agriculture counted towards the effort sharing sector, excluding energy use emissions, have remained relatively stable over the last few years. In 2024, agricultural emissions decreased by 0.05 Mt CO_2-eq from 2023, amounting to around 6.2 Mt CO_2-eq (see Figure 15). Emissions in 2022 were exceptionally low due to lower emissions from fertiliser use, as the high price of fertilisers reduced their use.

Figure 15. Emissions from agriculture accounted for under the effort sharing sector in the in 2005–2024 and estimate of the emissions trend according to the WEM scenario. The 2024 data is instant preliminary data.



Emissions relating to agricultural soils reported under the LULUCF sector have likewise remained more or less the same since 2005. About three quarters of total agricultural emissions are related to soil, including both carbon dioxide emissions in the land use sector and nitrogen oxide emissions in the agricultural sector. Of these emissions, in turn, around three quarters are related to organic soils, that is, peatland. Since research indicates that the most effective emissions reduction measures in agriculture are precisely related to organic soils, the MTCP emissions reduction measures mainly focus on these soils. These measures will reduce emissions in both the effort sharing and land use sectors.

Table 4. Agriculture – key policy measures in place.

Policy measure	Implementation status
Restricting land clearing	Partially implemented. CAP GAEC2 and EU Deforestation Regulation
Afforestation	The act on support for afforestation was enacted for a fixed term and the application period for support ended on 31 December 2023. The Finnish Forestry Centre made a decision on all afforestation support applications by 30 June 2024. The intention was to continue and extend the support scheme, but as a result of government negotiations, the scheme was abolished as an austerity measure.
Agricultural land to climate wetlands	Partially implemented: Non-productive CAP investments • A roadmap for the use of agricultural peatlands was drawn up. • A spatial data set was produced from the agricultural peatland data (MaaTu) to be used as reference data, e.g. for the GHG inventory. • Implement the 2023–2025 climate pilot The National Land Survey of Finland's land consolidation to water peat fields as climate wetlands
Cultivation of wet peatlands (paludiculture)	Partially implemented: • CAP investment and management aid (drainage water management) for weather-compensated drainage; eligible crops include grassland and reed canary grass. • Also see the previous item.
Grassland instead of annual crops, more carbon into fields	Implemented. CAP support, including planting winter cover crops, promotion of the circular economy, catch crops, grasses on peat fields, green fertiliser grasses, using organic mulch on garden plants, and renovation plants. The conditions that farmers who apply for support must follow in order to be eligible for full subsidy are a ban on burning stubble fields and the requirement that fallow lands be stubble or plant-covered, and permanent grassland.
Precision farming	Implemented. CAP investment support for equipment and tools to promote precision farming. In addition, the farm-specific measure of the environmental payment provides an incentive to adopt precision-farming methods.

Policy measure	Implementation status
Reducing methane emissions from dairy cows through feeding methods	Partially implemented: • Feeding plans • CAP animal welfare payments Climate smart feeding solutions for Finnish milk production sector (IRMA) project. The project aimed to solve questions related to adoption of 3-NOP relevant from the Finnish perspective.

The 2022 Medium-term Climate Change Policy Plan (MTCP2) agricultural emission reduction measures are related to land use change, arable land use and enteric fermentation in livestock. The MTCP2 also lists measures that are likely to contribute towards GHG emission reductions in agriculture in the future but the magnitude of the effects of these cannot currently be calculated. In the Climate Plan for the Land Use Sector, agriculture-related emissions reduction measures focus on peatland fields.

Measures to reduce emissions and adapt to climate change in agriculture are mainly implemented through the measures of the national Common Agricultural Policy (CAP) Strategic Plan (Finland's CAP Strategic Plan for 2023–2027). It is not possible or appropriate to implement all of the agricultural climate change mitigation or adaptation measures under CAP. Instead, it should be possible to also introduce other EU or national measures.

Completed in November 2024, the Roadmap for the use of agricultural peatlands outlines measures to adapt peatland fields to environmental objectives and agricultural production needs by 2050. As a tool designed to support decision-making, the Roadmap presents two different scenarios for 2050 with their rationales: one focusing on environmental objectives and the other on production potential. Changes in the use of peat fields require a concerted effort from society as a whole, as implementing the measures requires careful planning, expertise and investment and entails costs and income losses for farmers.

A research project entitled "Climate smart feeding solutions for Finnish milk production sector (IRMA)" was completed in late 2024. A study led by the Natural Resources Institute Finland (LUKE) investigated the issues related to the introduction on Finnish dairy farms of the first feed additive to reduce rumen methane formation, 3-nitrooxypropanol (3-NOP; Bovaer® (trade name)), approved

in the European Union in 2022. The study showed that 3-NOP also reduces methane emissions in Finnish silage grass-based diets, although the reduction (around 20%) was slightly lower than expected from international studies (around 30%). The additive has been found to be cost-effective and, when used in accordance with the conditions of the authorisation, has no adverse effects. The additive is metabolised in the digestive tract of the cow, is not transferred to milk or meat and has not been found to have any adverse effects on cow health. In Finland, the additive is currently used on a few dozen dairy farms.

Various incentive schemes are available for research, experiments, advice and investments in streamlining manure management and nutrient recycling. The Programme for Nutrient Recycling of the Ministry of Agriculture and Forestry provides funding for biogas, manure management, nutrient recycling and carbon sequestration investments and innovations. Between 2020 and 2024, support under the Programme for Nutrient Recycling was granted to 67 research, development and innovation projects, 11 investment projects and three separate thematic projects. All projects funded under the programme aim to contribute to the recycling of nutrients and the production and use of biogas. The programme enables companies to carry out business development experiments and investments. A total of EUR 2,203.107 was committed to 15 new RDI projects in calendar year 2024. The amounts of investment grants available are much lower than in the past and were committed to two projects for a total of EUR 345,206 in the calendar year. March 2024 saw the launch of operational grants for nutrient recycling available for biogas plants producing biogas and highly processed nutrient products for the market from manure or waste from the management of aquatic vegetation. A total of EUR 9 million is available for the grants for nutrient recycling in 2023–2026. In the first round of tenders for the nutrient cycling grants, funding was awarded to five plants for a total of around EUR 5 million.

A long-term strategy for Finnish food production and a food-sector growth programme aiming to increase food exports are being drafted in line with the Government Programme. The strategy will be completed by the end of 2025 and the growth programme will continue throughout the government term. The strategy work has created a vision for 2040 entitled "Excellent food from the world's most sustainable food system!". The vision emphasises the sustainability of food production and indicates that food systems and their value chains are constantly being developed. The vision and the related objectives comprise the economic, ecological, social and cultural dimensions of sustainability. The aim is to maintain and continuously improve our wellbeing. The Government is committed to improving the sustainability and resilience of the Finnish food system and to doubling food exports by 2031.

As measures related to food consumption, the Medium-term Climate Change Policy Plan highlights the reduction of edible food waste and promotion of eating in accordance with nutrition recommendations. The new National Nutrition Recommendations and Nutrition Commitment were published in November 2024. The national recommendations are based on the Nordic Nutrition Recommendations published in 2023. The new National Nutrition Recommendations guide towards more plant-based diets for both health and environmental reasons. The recommended diet is versatile, varied, moderate and enjoyable.

Reducing food waste and changing food consumption will not reduce the agricultural and LULUCF sector emissions reported in Finland unless changes also take place in the production of Finnish food.

Public food procurement and public food and catering services play a key role in improving the sustainability of the food system. The objective set for public food and catering services has long been to increase the proportion of plant-based food in their meal offer in line with official nutrition and dietary recommendations. The meal recommendations for primary, lower secondary, upper secondary and higher education recommend that vegetarian food should be offered as a free option for everyone every day or a weekly vegetarian food day should be added to the menu. They also recommend putting more fish and vegetables on the menu. Many municipalities are already applying these recommendations and have also increased the offering of plant-based food more broadly to reach their climate targets.

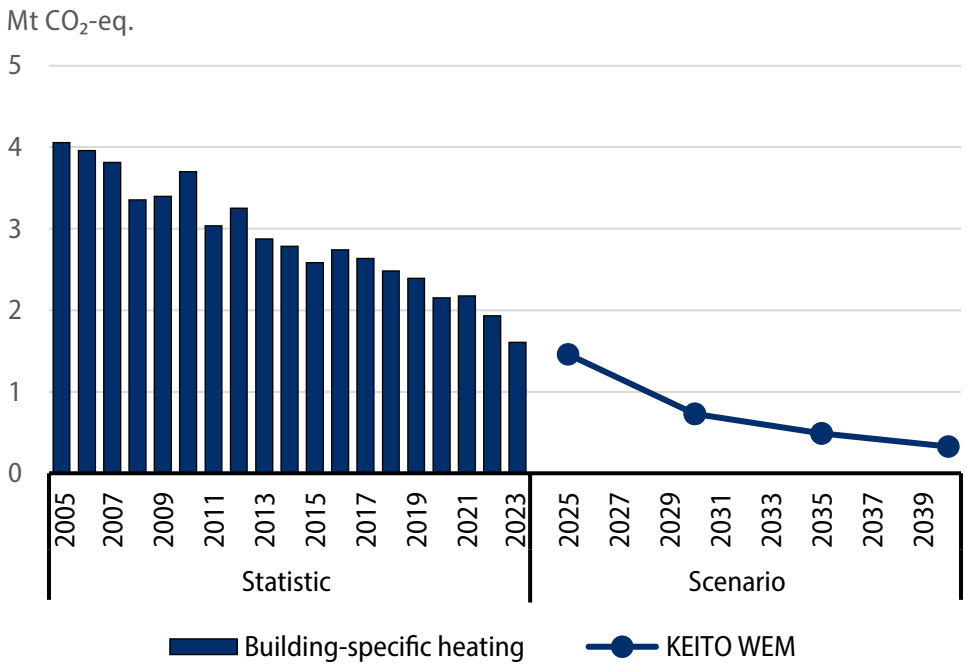
The National Public Procurement Strategy also sets an objective concerning food and food and catering service procurement promoting a sustainable food system. The Ministry of Agriculture and Forestry has continued the implementation of the objective by updating the sustainability criteria for products of animal origin (meat and dairy products and eggs) together with Motiva Ltd. The new criteria, published in autumn 2024, will better support sustainable development and responsible public procurement. In addition, the Ministry of Agriculture and Forestry has organised training and events for food and catering services and procurement units to support responsible food procurement, in cooperation with stakeholders. A KasvisPro training course was implemented as a food chain development project funded by the Ministry of Agriculture and Forestry to increase the knowledge of plant protein and vegetarian food in public food and catering services. The training consisted of a theoretical part to increase the knowledge of vegetarian food,

cooking training and a toolkit with practical tips on how to prepare vegetarian food. The extensive learning material and recipe bank produced during the training are freely available.

5.2.3 Building-specific heating

In the baseline (WEM) scenario, emissions are expected to decrease as a result of the renewal and renovation of the building stock and changes to heating systems. The obligation to distribute biofuel oil and substitution of fossil oil heating with other forms of heating will result in a significant reduction in emissions. Greenhouse gas emissions from oil heating in residential buildings amounted to 0.2 Mt CO_2-eq in 2023. Under the baseline scenario, emissions from building-specific heating will fall to 0.7 million tonnes of carbon dioxide equivalent in 2030.

Figure 16. Emissions from building-specific heating in 2005–2023. No disaggregated emissions from building-specific heating are available in the proxy estimate.



The oil sector and the central government have signed an Energy Efficiency Agreement on the Distribution of Liquid Heating Fuels (Höylä IV), which aims to improve energy efficiency in oil-heated buildings and promote renewable energy sources in oil heating. The agreement covers the period from 2017 to 2025. Negotiations have been launched for a new agreement period starting in 2026. The Parties to the agreement are the Ministry of Economic Affairs and Employment, the Ministry of the Environment, the oil and biofuel industry and the major suppliers of liquid heating fuels. In addition, the Oil Industry Service Centre Ltd and the Finnish Association of Heating Energy are committed to implementing the agreement.

On 11 April 2024, the Government adopted a Resolution (Ministry of the Environment/2024/17) on the phasing out of fossil heating oil. The programme of measures related to the Government Resolution aims to eliminate emissions from building-specific heating by 2030.

Table 5. Building-specific heating – key policy measures in place.

Policy measure	Implementation status
Phasing out oil heating in residential and service properties	Implemented. Appropriations allocated for 2023, but not beyond. Grants will still be awarded within the remaining budget for 2025.
Support for phasing out fossil oil or gas heating for households	Implemented. Appropriations allocated for 2023, but not beyond. Support will still be awarded in 2025.
Increased household tax credit for phasing out fossil oil heating	Implemented, available until year-end 2027.
Emissions trading for fossil fuel distribution	Implemented (emissions trading to start in 2027).

Newly introduced grants will be used to promote phasing out oil use in residential properties. In the summer of 2022, the subsidy scheme for detached houses was extended to cover phasing out natural gas heating. The support for phasing out oil heating has stepped up heating system replacement rates to a considerable extent. The estimated impact on annual emissions of the change in heating mode by those who were granted support by year-end 2024 is about 0.14 Mt CO_2-eq. Around 30,000 properties had been granted support by the end of 2024. The amount of support granted by year-end 2024 stood at EUR 111,401,000. The current support is

ending in summer 2025. The tax credit for household expenses available in income taxation is an alternative support form for owners of a detached or semi-detached house planning to upgrade their heating system.

Phasing out oil heating and switching to other forms of heating in municipally owned buildings has been expedited by grants since October 2020. In the 2023 Budget, EUR 10.86 million was re-budgeted for the grant, with the targeted annual emissions reduction being around 11 kt CO_2-eq. A total of 174 decisions were made between 2020 and 2024, amounting to a total of EUR 17 million.

Efforts have also been made to reduce emissions from residential buildings by means of energy grants awarded for projects improving energy efficiency to a level significantly higher than the required level. The estimated impact on annual emissions is around 0.16 Mt CO_2-eq. The impact will cover emissions from all residential buildings rather than just oil-heated properties. Consequently, some of the emissions reduction impacts will be allocated to the emissions trading sector.

Efforts are being made to reduce energy consumption and emissions from properties by means of voluntary agreements. Through Property and Building Sector Energy Efficiency Agreements, property owners commit to improving the energy efficiency of commercial and residential rental properties. The current agreement periods expire at the end of 2025 and the next ten-year period is under preparation.

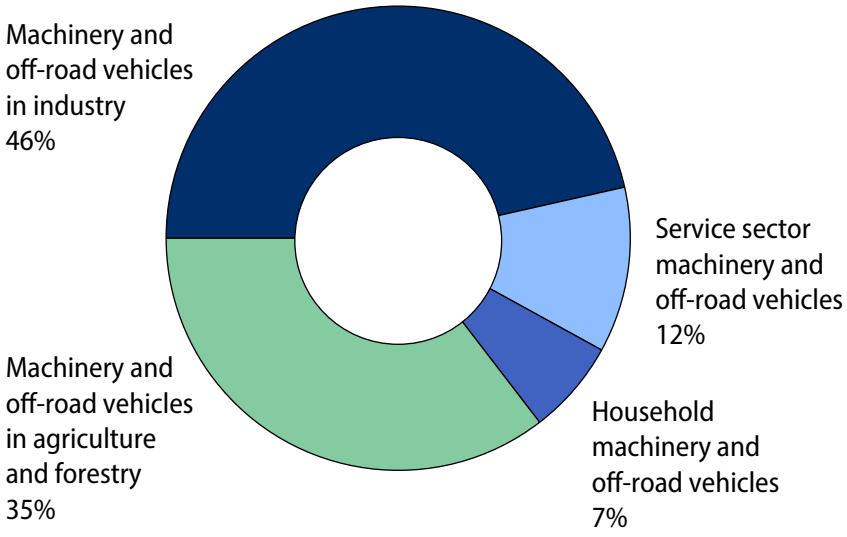
5.2.4 Non-road mobile machinery

GHG emissions from non-road mobile machinery in 2023 totalled 2.4 Mt CO_2-eq, accounting for around 6% of Finland's total emissions and 9% of the effort sharing sector's emissions. Emissions from non-road mobile machinery have remained more or less unchanged in recent years (Figure 17). The instant preliminary data does not cover data for 2024, but it will be completed in late 2025. Of emissions from non-road mobile machinery, 46% were from industry, 12% from the service sector, 35% from agriculture and forestry and 7% from households.

Non-road mobile machinery includes equipment intended for a wide variety of applications, used in many different sectors and environments. Emissions from non-road mobile machinery vary from year to year, depending on factors such as the business cycles in the manufacturing and construction industries. The majority of GHG emissions from non-road mobile machinery in Finland are from diesel-powered machinery (Figure 17). Machinery age varies significantly in Finland and

a considerable number of old machines are still in operation, although non-road mobile machinery with high utilisation rates are clearly more recent than those with low rates.

Figure 17. Breakdown of GHG emissions from non-road mobile machinery in 2023.



Most of the environmental impacts of non-road mobile machinery are caused during operation. The most important environmental impacts caused during operation include CO_2 emissions and exhaust emissions that are harmful to human health. Exhaust emissions from non-road mobile machinery are typically much greater than those of cars. Figure 18 shows the actual machinery emissions trend and the trend in the baseline (WEM) scenario until 2040.

Figure 18. Emissions from non-road mobile machinery in 2005–2023 and estimate of the emissions trend according to the WEM scenario.

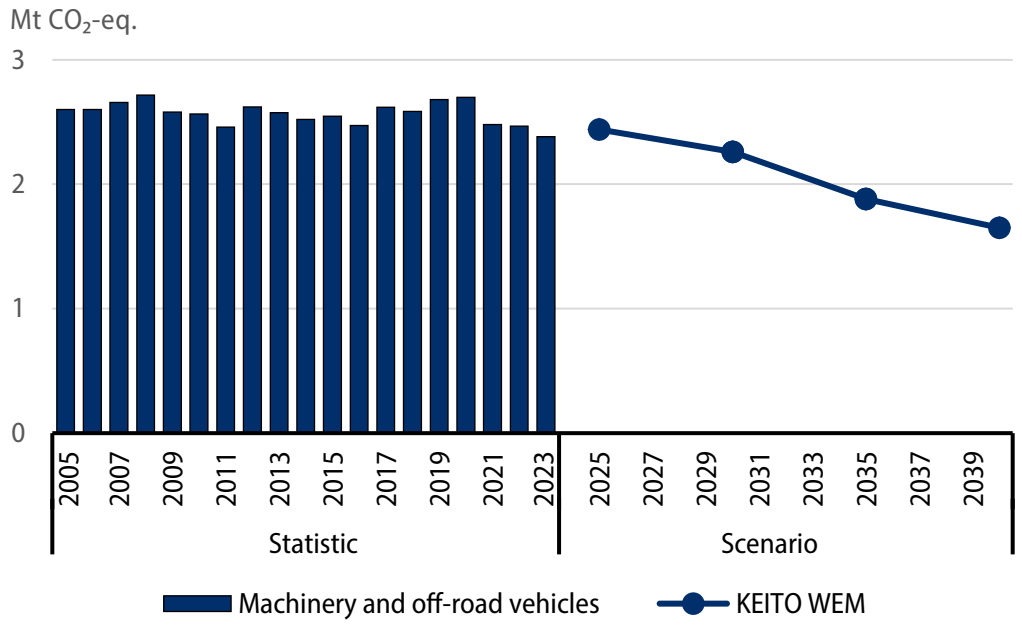


Table 6. Non-road mobile machinery – key policy measures in place.

Policy measure	Implementation status
Increasing the distribution obligation of biofuel oil in light fuel oil to 30% by 2030	Not implemented
Emissions trading for fossil fuel distribution	Implemented
Other measures (Green Deals, training, EU regulation, knowledge base)	Implemented

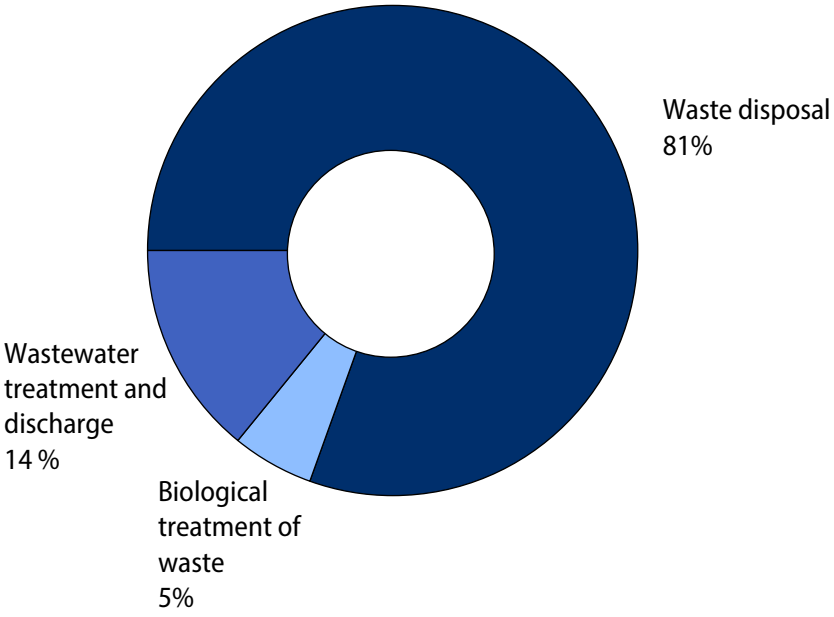
The single most important measure to reduce greenhouse gas emissions in the 2030 timeframe is to increase the biofuel share of light fuel oil. The government proposal prepared for Parliament in the previous Government's term to increase the biofuel share of light fuel oil to 30% by 2030 lapsed. Under current legislation, the biofuel share of light fuel oil had to be at least 6% in 2024 and at least 7% in 2025.

Progress was made in the national implementation of the EU-level emissions trading for fossil fuel distribution. The Act on Emissions Trading for Fossil Fuel Distribution entered into force on 1 January 2025. Emissions trading for fuel distribution has been extended nationally to include fuels from agriculture and forestry. This includes fuels used by agricultural and forestry machinery. The Green Deal for the non-road mobile machinery sector is valid until the end of 2025 and negotiations have started to extend the agreement for the 2026–2030 period. Market dialogues have been conducted under the Green Deal for emission-free worksites while also implementing a project for piloting electric machinery and a charging solution on construction sites. Maintenance of the Green Deal training package has been continued in 2024 and 2025. Efforts have been made to promote the development of EU-level regulation, building on a study the results of which were published in 2024. Emissions calculations for non-road mobile machinery have been developed as part of a project implemented by Statistics Finland. The ACE project has published a report on a policy-mix to promote the clean transition of mobile machinery (in Finnish).

5.2.5 Waste treatment and incineration

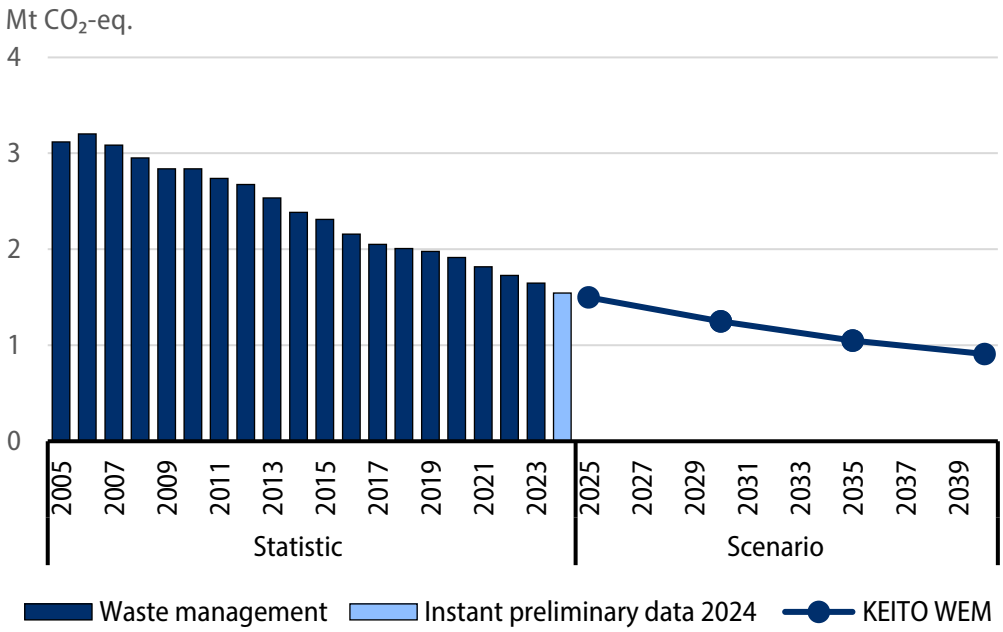
The sources of GHG emissions from waste management include landfills, biological waste treatment, i.e. both composting and anaerobic digestion, and wastewater treatment. Emissions caused by energy recovery from waste, i.e. waste incineration, are reported in the energy sector, and they are therefore not included in the data on emissions from waste treatment. Greenhouse gas emissions from waste treatment amounted to 1.6 Mt CO_2-eq in 2023 and, based on instant preliminary data, to 1.5 Mt CO_2-eq in 2024 (Figure 19). This accounts for around 6% of emissions from Finland's effort sharing sector. Waste treatment emissions have been decreasing steadily since the 1990s. The decrease since 2005 is 51%. Methane produced by landfills is the most significant source of emissions in waste treatment.

Figure 19. Breakdown of greenhouse gas emissions from waste treatment in 2023.



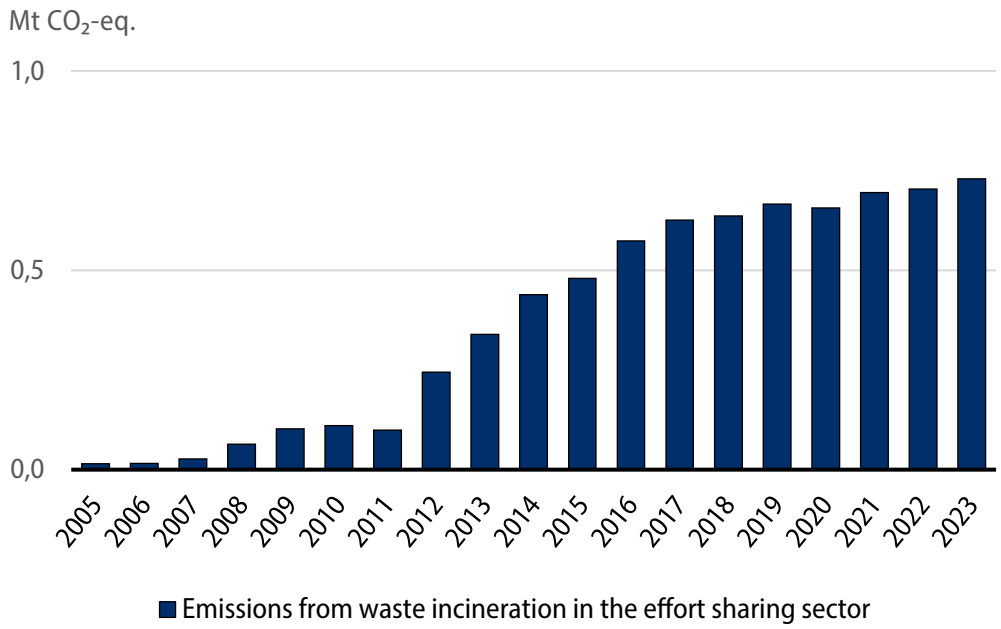
Since 2005, greatest reductions have been achieved in methane emissions from landfills, as landfilling of organic waste has declined to the point that practically no municipal or other organic waste is being landfilled any longer. The disposal of municipal waste by landfilling has been almost completely replaced by recycling and energy recovery from waste. Landfill gas recovery has also reduced emissions. Methane emissions from anaerobic digestion have slightly increased as the method has become more prevalent, whereas greenhouse gas emissions from composting have correspondingly decreased as a result of its declining prevalence. The emissions trend in wastewater treatment has been relatively stable and the emissions are expected to remain more or less unchanged.

Figure 20. Trend in emissions from waste treatment in 2005–2024 and an estimate based on the baseline scenario of the emissions trend that can be achieved with existing measures (WEM) in 2025–2040. The 2024 data is instant preliminary data. The figure does not include greenhouse gas emissions from waste incineration.



Emissions from municipal waste incineration plants are mainly accounted for in the effort sharing sector, whereas co-incineration plants fall within the emissions trading sector. The effort sharing sector's emissions from waste incineration have risen very significantly since 2005. This is due to increased energy recovery from municipal and other waste. About 55% of municipal waste generated in 2023 was recovered for energy, while only about 17% of municipal waste was incinerated in 2008.

Figure 21. The emissions trend in waste incineration in the effort sharing sector in 2005–2023.



Waste incineration plants will report emissions data for the first time in 2025 under emissions trading legislation, even though they are part of the effort sharing sector. Many waste incinerators have also announced plans to capture carbon dioxide in their plants. Depending on the plant, the captured carbon dioxide will either be transported abroad for storage (carbon capture and storage, CCS) or used to produce fuel or another product (carbon capture and utilisation, CCU). Imports of waste for incineration have increased significantly. The increase is mainly due to higher imports of waste-based fuels which, according to instant preliminary data, almost doubled in 2024 compared with the previous year.

A working group set up by the Ministry of the Environment in June 2024 is preparing a new Circular Economy Act to replace the Waste Act. Among other things, the Circular Economy Act aims to promote recycling and reduce the incineration of recyclable waste. If implemented, the legislative reform can help reduce greenhouse gas emissions from the waste sector, but it is difficult to estimate the emission reductions in advance.

The national roadmap for a low-carbon water sector was published in May 2025, setting the framework for emission reduction measures in the water supply sector at national level. The roadmap identifies the key emission reduction measures, assesses their impact on greenhouse gas emissions and estimates their costs at a general level.

Table 7. Waste treatment and incineration – key policy measures in place.

Policy measure	Implementation status
Preparing voluntary Green Deal for municipal waste incineration that covers the entire waste value chain in order to reduce greenhouse gas emissions	Not implemented. Discussions on a Green Deal for waste incineration were held, but the preparation of the agreement was abandoned in February 2023.
Carrying out pilot projects on carbon capture and utilisation or storage (CCU/CCSU) technologies in waste incineration plants.	Implemented. Pilot projects on carbon capture and utilisation or storage (CCU/CCSU) technologies in waste incineration were carried out by several companies.
Enhancing recycling and limiting incineration to non-recyclable waste	Implemented. Enhancing and monitoring the implementation and enforcement of existing separate collection obligations. Identifying and preparing new guidance instruments to increase recycling and to curb and limit waste incineration to non-recyclable waste, e.g. through the Circular Economy Act.
Preparing a national low-carbon roadmap for water utilities	Implemented. The roadmap was published in May 2025.

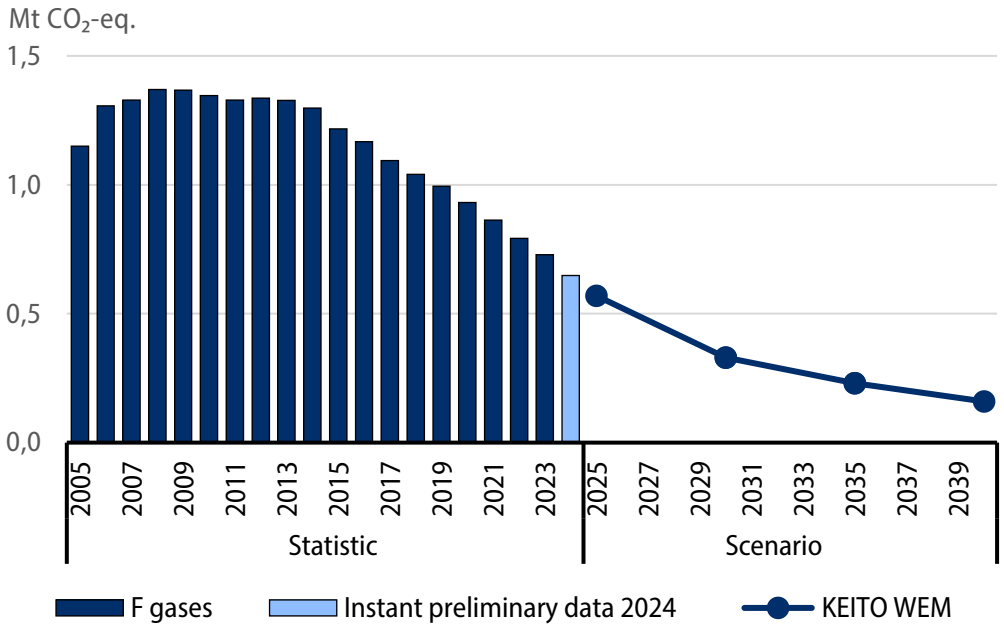
5.2.6 F-gases

Emissions from the use of fluorinated greenhouse gases (F-gases) increased from the 1990s up until 2008, after which the growth reversed, and in recent years emissions have been falling. F-gases are mainly used in refrigeration equipment, heat pumps, electrical switchgear, fire-fighting, foam blowing, and as aerosols and solvents. The most significant reason for the increase in F-gas emissions since the 1990s is the replacement of ozone-depleting compounds with F-gases

in refrigeration and cooling equipment and other applications. Usage volumes are also increased by the higher number of air-conditioning equipment and heat pumps used.

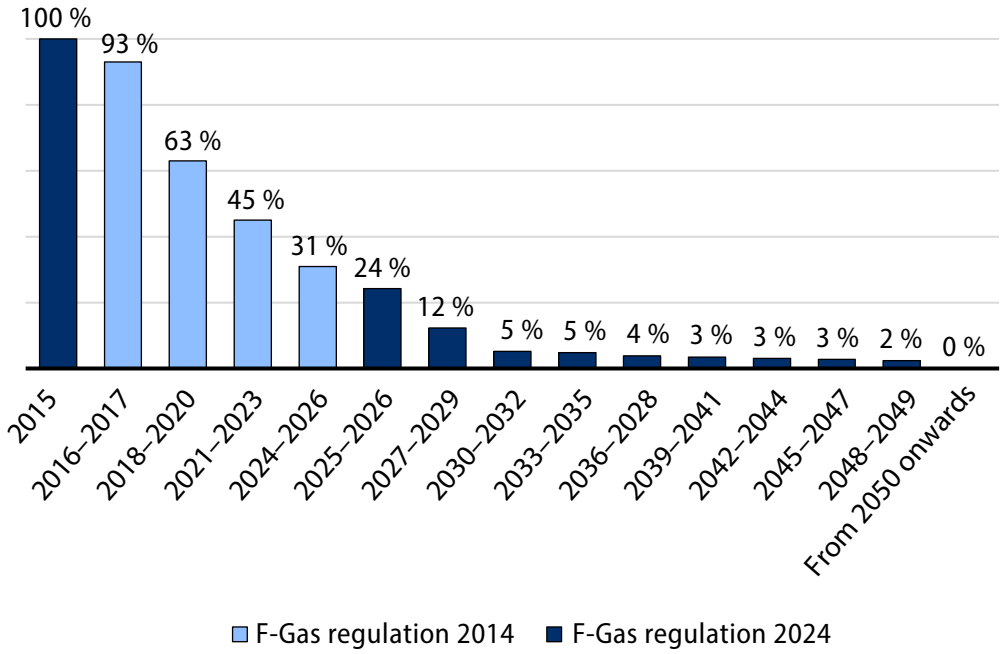
According to instant preliminary data, F-gas emissions decreased in 2024 relative to the previous year, standing at 0.6 Mt CO_2-eq. The decrease since the 2008 peak year is 53%.

Figure 22. F-gas emissions in 2005–2024 and estimate of the emissions trend according to the WEM scenario. The 2024 data is instant preliminary data.



In large refrigeration plants in the trade sector, refrigerants with high Global Warming Potential (GWP) have already been replaced with CO_2 and, to a smaller extent, by propane in new equipment. In vehicle air-conditioning systems, hydrofluorocarbon (HFC) refrigerants have already been replaced with a low-GWP refrigerant in the air-conditioning systems of new passenger cars and small vans. The EU's new F-Gas Regulation (EU) 2024/573 has entered into force. Measures under the Regulation will gradually phase out the placing on the market of virgin HFC compounds by 2050.

Figure 23. The quota of HFC compounds to be placed on the market within the EU in 2015–2030 as a percentage of the 2009–2012 levels.



Some F-gases are per- and polyfluoroalkyl substances (PFASs) a restriction on the manufacture, placing on the market and use of which has been proposed under the EU's REACH Regulation (EC) No 1907/2006. The specific contents and entry into force of the restriction are still not yet known. If realised in the proposed form, the restriction is projected to result in significant emissions reductions. As these compounds are not subject to mandatory GHG reporting, the reduction will not be reflected in the reported emissions under the current inventory rules. However, their impact on Finland's total emissions is not significant. The aim is to avoid equipment containing F-gases in public procurements. To this end, a set of public procurement criteria for alternatives to HFC compounds is used as a policy instrument. Communication and implementation of the criteria are underway.

The adoption of alternative technologies and enhancement of the recovery of F-gases are promoted by means of training and communication. The Finnish Environment Institute has stepped up the provision of information and guidance on alternative substances. Another aim is to improve the management and recovery of F-gas stored in appliances and products. To further this aim, the Finnish Environment Institute published a report in 2023 on the quantities of F-gases and ozone-depleting substances stored in products and equipment.

With existing measures, F-gas emissions are projected to fall to 0.3 million tonnes of carbon dioxide equivalent in 2030 and to 0.2 million tonnes in 2040.

Table 8. F-gases – key policy measures in place.

Policy measure	Implementation status
Implementation of the EU F-gas Regulation	Implemented. National implementation of F-gas Regulation is underway. The first reforms of national training systems leading to staff qualifications have been carried out. Information to industries has been stepped up.
Avoiding equipment containing F-gases in public procurement	Partially implemented. Communication is ongoing. Reform of the procurement criteria has not progressed due to a lack of resources.
Promoting the use of alternative refrigerants	Implemented. Information guidance on switching to alternative refrigerants will continue. Alternative refrigerants are included in the vocational qualifications in building maintenance technology.
improving the life-cycle management of F-gases and ozone-depleting substances	Not implemented. In addition to the earlier study on gas banks, the necessary national plan to improve the life-cycle management of refrigerants could not be moved forward due to a lack of resources.

5.2.7 Other emissions and cross-sectoral climate action

Energy-related emissions outside the general emissions trading system

Energy-related emissions outside the general emissions trading system (ETS1) are addressed by means of energy taxation, energy support, energy-efficiency measures and the distribution obligation concerning light fuel oil as described in Section 5.1. The policy measures for non-ETS energy-related emissions and their implementation status for the effort sharing sector are presented in Table 9.

Table 9. Non-ETS industries and other energy use – key policy measures in place.

Policy measure	Implementation status
Increasing the distribution obligation of biofuel oil in light fuel oil to 30% by 2030	Not implemented
Updating sectoral low-carbon roadmaps	Implemented. The updated roadmaps were completed in 2024.
Emissions trading for fossil fuel distribution	Implemented (emissions trading to start in 2027).

Climate work in municipalities and regions

Municipalities and regions play an important role in Finland's efforts to achieve carbon neutrality by 2035. Municipalities are responsible for regional land use, statutory land use planning, land use, transport planning, ownership steering of municipality-owned energy companies, heating choices for many buildings and public procurement, for example.

By speeding up municipal climate work, Finland can achieve emissions reductions. While there are several municipalities in Finland that are pioneers in climate work, there are also many that have not yet started their climate work or drawn up climate plans.

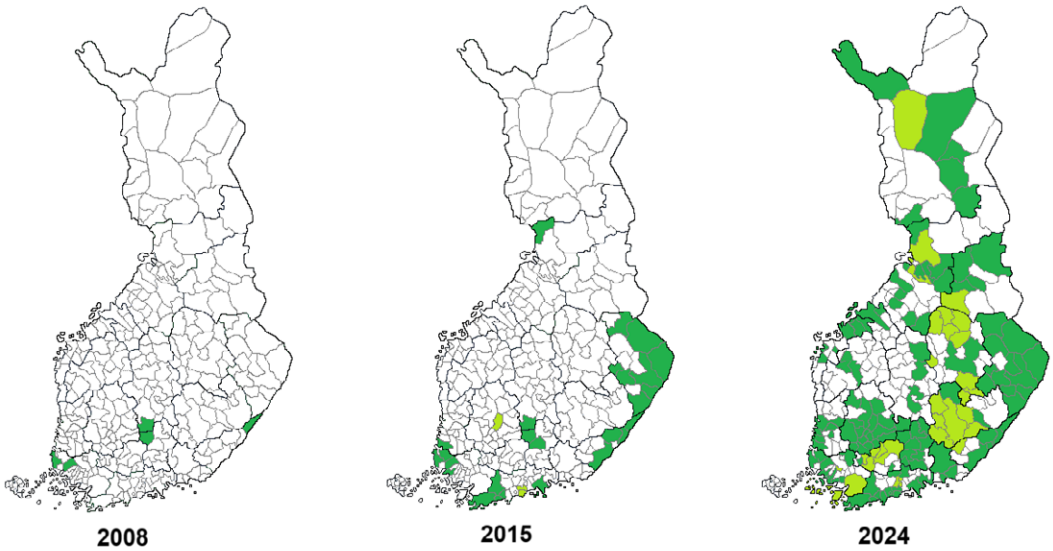
Municipalities' commitment to climate work can be seen in the increasing popularity of voluntary climate networks, especially the HINKU network. The municipal climate work is also supported by the Climate Municipalities of the Federation of Finnish Municipalities, the Fisu network of resource-wise

municipalities (Finnish Sustainable Communities) and the EU's 100 Climate-Neutral and Smart Cities mission. Many municipalities have also networked internationally and have received international recognition for their activities.

The climate plan obligation included in the Climate Act in 2023 was abolished on 1 January 2025. The Municipal Climate Change Solutions Programme boosting climate work in municipalities and regions ended in 2024. MAL agreements with the urban regions of Helsinki, Tampere, Turku, Oulu, Jyväskylä, Kuopio and Lahti are valid from 2024 to 2035. The agreements aim to achieve a more cohesive and dense urban fabric and direct housing to locations that are well served by sustainable modes of transport.

Regional climate cooperation of Centres for Economic Development, Transport and the Environment and regional councils supports local climate action taken by municipalities. All of the 15 Centres for Economic Development, Transport and the Environment engage in climate action. The Centres for Economic Development, Transport and the Environment for Pirkanmaa and North Ostrobothnia have been assigned duties relating to the regional implementation of the climate plans under the Climate Act. The climate duties of these two ELY Centres are specified in a Decree (90/2024).

Figure 24. Municipalities with a carbon neutrality target or a target of reducing emissions by at least 80% by 2030 (dark green) or post-2030 (light green). The figure shows the situation in 2008, 2015 and 2024.



Circular economy

Finland's circular economy work is guided by the Strategic Programme for a Circular Economy, which aims for a carbon-neutral circular economy society by 2035. The programme was completed in 2021 and extended in 2024. The programme sets a vision and objectives for a circular economy and halting the growth in the use of natural resources, determines the measures and monitoring indicators required and proposes the resources necessary to promote a circular economy.

The programme involved carrying out an assessment of the material flows in the Finnish economy, the impact of potential circular economy measures on the economy, the environment and the climate, which is unique in Finland and even the world.

The results show that circular economy measures and clean energy transition are moving Finland towards carbon neutrality, but further action is needed to achieve the carbon neutrality target. Circular economy measures reduce emissions and consumption of natural resources and strengthen sinks without weakening the national economy. In particular, solutions that promote materials efficiency and that relate to the carbon cycle support the achievement of the carbon neutrality target. Impacts can be seen in both further reductions in energy-based emissions as well as in the strengthening of the net sink of the LULUCF sector.

Making targets a reality with Green Deal commitments for the circular economy. Launched in September 2024, the Circular Economy Green Deal is a voluntary commitment in which the participating organisations commit to reducing the use of natural resources and setting goals and to taking actions that promote a low-carbon circular economy. As part of this commitment, the government is also promoting the circular economy through its own actions. The Green Deal is intended for companies, sectoral organisations, municipalities and regions.

Circular economy work is also progressing at EU level. In the EU, the circular economy, product repair and eco-design are promoted by the new Ecodesign Regulation (EU) 2024/1781 and the Right-to-Repair Directive (EU) 2024/1799, which entered into force in July 2024. The Ecodesign Regulation extends the regulation of sustainable products to a large proportion of household consumer goods. The EU is planning a Circular Economy Act, which was presented as a proposal as part of the Clean Industry programme.

Fact box: Carbon handprint – Focus on positive climate impacts of exports and methods for assessing them

The first estimates of the carbon handprint of Finnish exports, produced by the Finnish Environment Institute (Syke), were completed last year as part of the Carbon Handprint for Finland project funded by the Ministry of the Environment. Based on the results, the carbon handprint of Finnish exports in 2019 was 13–23 million tonnes of carbon dioxide equivalent, depending on the assumed country of origin of the products substituted by the exports. However, producing a handprint estimate is not entirely straightforward and the issues associated with the calculation make it challenging to use as an official method for assessing national or sectoral climate benefits, for example.

Climate impact assessment has traditionally focused on reducing the negative impacts of climate change. In contrast, carbon or climate handprint calculations focus on assessing the positive climate impacts of products and services based on a comparison of climate and carbon footprints describing negative impacts. Indeed, the carbon or climate handprint means the potential positive climate impacts that the introduction of a product or activity is assumed to create when replacing a product or activity otherwise available and delivering the same functionality.

While handprint thinking offers a new approach to assessing the climate impacts of products and services, it involves significant methodological and practical challenges. No commonly adopted and harmonised calculation method for the climate or carbon handprint exists. One of the key challenges is to consistently define product substitutability, i.e. how and which products are substitutable in a global market.

The handprint calculation method developed by the Finnish Environment Institute is based on an environmentally extended input-output model for the Finnish economy (ENVIMAT), comparing the emission intensities of different product groups between Finnish and foreign production. The estimate covers exports as part of Finland's national economy as a whole, not just individual products, making it also one of the first of its kind internationally. A key strength of the Syke approach is that it allows the life-cycle emissions (carbon footprints) of product groups of different origins to be determined in a highly

comparable and transparent way. At the same time, however, a typical problem with handprint calculations is the question of determining the reference level. Moreover, the methodology used by Syke in a previous study cannot take into account substitutability between product groups, which is likely to occur for new or growing products as they enter the market. Some of the export products can therefore be seen as substitutes for products featuring various technologies already on the market. This can be the case, for example, with electric vehicle batteries.

The second part of the project will therefore focus on the main export products of the major industries at a more detailed, product-based level and the carbon footprint of these products and those that are expected to be substituted in the export market, resulting in the carbon handprint of these products. The results are compared with the carbon footprint of the whole industry's products calculated using the input-output model and a rough estimate is made of the impact that these substitution ratios could have on the carbon handprint of the whole industry and the whole economy's exports, using the so-called hybrid life-cycle assessment (LCA) method.

5.3 Climate Plan for the Land Use Sector

Adopted by the Government in July 2022, the Climate Plan for the Land Use Sector includes a large number of different measures that seek to reduce LULUCF sector emissions or strengthen the sector's sink. The quantitative target set for the LULUCF sector in the plan is an annual net impact of at least three million tonnes of carbon dioxide equivalent by 2035. Commissioned by the Ministry of Agriculture and Forestry, the Natural Resources Institute Finland updated the scenarios review of the Climate Plan for the Land Use Sector in January 2024. In the updated scenario, the plan's measures can increase sinks or achieve emission reductions of at least 3 Mt CO_2-eq.

The Ministry of Agriculture and Forestry implemented the Climate Plan for the Land Use Sector within the existing funding in 2024. No specific funding has been allocated to the plan during this government term, which has slowed down implementation. Implementation has been promoted through existing policy instruments, such as the Temporary Forestry Incentive Scheme, the National Forest

Strategy 2035 (NFS 2035) and the Common Agricultural Policy (CAP). The primary aim of these instruments is not, however, to promote measures included in the Climate Plan for the Land Use Sector.

The large-scale implementation of the Climate Plan for the Land Use Sector requires that funding is secured. The National Climate Unit of the ELY Centres is responsible for promoting regional climate action in the LULUCF sector, agriculture and adaptation to climate change. The unit will help regional actors access climate finance and develop skills, providing up-to-date climate information and expert services to meet regional needs. The unit will expand EU mission networks and support the continuity of actor and ELY expert networks for mitigation and adaptation in the context of regional government reform (e.g. stormwater and drainage network).

The Natural Resources Institute Finland was commissioned by the Ministry of Agriculture and Forestry to develop a monitoring system for the Climate Plan for the Land Use Sector in 2024. The actual data by measure is given in Appendix 5. It is not possible to collect monitoring data for all of the plan's measures due to a lack of data sources.

Since the completion of the Climate Plan for the Land Use Sector, the situational picture, development and future outlook of the LULUCF sector have also changed significantly as a result of updating new inventory data and calculation methods. The plan is prepared in every other electoral term. The timeliness of the climate plan and the need for new measures will be assessed during the electoral terms when there is no obligation to prepare a plan. The Ministry of Agriculture and Forestry will carry out an evaluation of the plan during 2025 and prepare a mid-term evaluation by the end of 2025.

Table 10. Climate Plan for the Land Use Sector – key policy measures in place.

Policy measure	Implementation status
Climate actions in state-owned forests	Implemented. In accordance with its ownership policy, Metsähallitus will continue to increase the net carbon sink of its multi-use forests so that the net carbon sink increases by at least ten per cent before 2035.
Prevention of deforestation	Implemented. CAP GAEC2 standards and the EU Deforestation Regulation. Impact assessment of a charge for changes to land use drawn up in 1/2024.
Afforestation of waste land and low-yield fields	Partially implemented. The afforestation support scheme for wastelands was limited in time from 2021 to 2023 and the application period for the support ended at year-end 2023. The preparation of a new support scheme for the expansion of forest area was agreed in the Government's mid-term policy review in April 2025 and the new support scheme is to enter into force from the beginning of 2027.
Climate-resilient use of peatland fields	Implemented. CAP, e.g. non-productive investments, investment and management aid for controlled subsurface drainage. A roadmap for the use of agricultural peatlands was drawn up as part of the plan's implementation. A spatial data set of peat data from agricultural lands was produced and also integrated into Finland's national GHG inventory. (MaaTu). A climate pilot project of the National Land Survey of Finland's land consolidation was implemented in 2023–2025 to rewet peat fields as climate wetlands. Promoting the SOTKA Wetlands project. Additional funding allocated for 2025 as part of the Helmi programme. The appropriation will make it possible to establish around 300 ha of new wetlands.
Climate-resilient management and use of peatland forests	Implemented. Promotion of ash fertilisation through the Temporary Forestry Incentive Scheme. The additional funding from supplementary budget 3/2024 will allow 5,600 ha more to be used for forest health fertilisation.

Policy measure	Implementation status
Catchment area planning	Implemented. The Roadmap for Catchment-based Planning was drawn up in 2024.
Promoting markets and incentives related to carbon sequestration and storage and the reduction of emissions	Implemented. Participated in the preparation of the Carbon Removals Certification Framework (CRCF) and the agricultural emissions trading system in cooperation at EU level. Launched a pilot project for a tendering procedure for peatland rewetting and a metrics project to promote the introduction of performance-based funding models. A study on the development of performance-based aid for forestry was completed in January 2025. Legislative drafting started in spring 2025. While the selected pilots (increasing the proportion of deciduous trees, protection zones, peatland restoration and nature management of groves) are mainly related to biodiversity, they also have climate impacts. Contributed to the legislative preparation of the flexibility mechanism for the distribution obligation.
Catch the Carbon research and innovation programme	Implemented (2020–2024).
Experiments and deployment (Catch the Carbon development projects)	Implemented (2020–2024).
Other measures promoting carbon sequestration and storage	Implemented. Carbon sequestration measures for farmers are part of the CAP aid scheme. Action was taken to strengthen forest growth, carbon sink and carbon stocks and reduce emissions as part of the implementation of the National Forestry Strategy 2035. Official preparation of a package of measures to strengthen forest growth and carbon sinks was launched in 2024. The package was outlined by the Government in its mid-term policy review session in 2025.

Policy measure	Implementation status
Other cross-cutting measures	Implemented. The GHG inventory will be developed through the MIRA project of the Natural Resources Institute Finland (Luke) and with additional funding from supplementary budget III/2024. A study on measuring forest aerosol formation launched in 2/2025 with appropriations from the supplementary budget. Prepared a call for projects to develop biogenic carbon accounting. In addition, a separate study was launched to identify uncertainties and sensitivities in the growing stock GHG calculations. Carried out the 2024 update of the low-carbon roadmaps for LULUCF sectors. Implemented a set of skills development measures for the land use sector between 2023 and 2024. Implemented the Catch the Carbon information programme for 2020-2024 (including refinement of soil data). Implemented EU and international cooperation and communication as part of the Catch Carbon Programme (Nordic Council of Ministers, UNFCCC, OECD, EU Commission and Parliament). Launched a study on the possibilities for developing a nature value market from the landowner's perspective.
Measures to be developed further and decided later	Launched the preparation of a national nature restoration plan, with several synergies for climate policy in the LULUCF sector.

Implementation of the Government Programme for the LULUCF sector in 2024

As part of implementation of the Climate Plan for the Land Use Sector and the Government Programme, public officials at the Ministry of Agriculture and Forestry prepared a package of measures to strengthen forest growth and carbon sinks during 2024 and submitted it to the National Forest Council on 26 March 2025.

The package of measures was prepared in close dialogue with forestry operators and researchers. They also made use of research data produced as part of the Catch the Carbon Programme on forest growth and the strengthening and guidance instruments of carbon sinks and stocks, as well as forestry sector operators' climate

and biodiversity roadmaps. Instead of setting a quantitative target for forest growth or carbon sinks, the work aimed to identify new additional ways to enhance forest growth and carbon sequestration and accelerate existing climate action.

The work took into account the slow realisation of some of the impacts and the Government Programme's stipulation that the changes should be implemented in such a way that they promote the economically, ecologically and socially sustainable management and use of forests and the role of forests as carbon sinks by the 2030s.

In recent years, a number of measures have been launched to promote forest growth and strengthen carbon sinks and stocks, including as part of implementation of the National Forestry Strategy and the Climate Plan for the Land Use Sector, as well as forestry sector operators' own work. The measures highlighted while preparing the package of measures to strengthen forest growth and carbon sinks are also largely in line with the objectives of good and continuously improving forest management as set out in the National Forestry Strategy (NFS 2035) and forest management recommendations.

The package of measures complements the measures of the Energy and Climate Strategy in the LULUCF sector and supports the national implementation of the National Climate Change Adaptation Plan and the Restoration Regulation. The Government plans to decide on further LULUCF sector measures as part of the Energy and Climate Strategy.

5.4 National Climate Change Adaptation Plan 2030

Under the Climate Act, climate change adaptation means measures taken to prepare for and adapt to climate change and its impacts, and measures that can be used to benefit from the impacts associated with climate change.

Finland's National Climate Change Adaptation Plan until 2030 (NAP2030) is part of the climate policy planning system under the Climate Act, and it has been prepared under the leadership of the Ministry of Agriculture and Forestry together with nine other ministries. NAP2030 will help Finland prepare for and adapt to the impacts of climate change. The plan emphasises joint action across government sectors and includes prioritised adaptation targets and measures for each ministry.

The implementation group of Finland's National Climate Change Adaptation Plan started operations at the beginning of 2025. The group aims to help prepare for climate change impacts and manage climate risks by promoting the implementation of the National Climate Change Adaptation Plan until 2030 in cooperation with different sectors and actors. The group also aims to strengthen national preparation of EU matters with regard to climate change adaptation in a cross-governmental manner.

Adaptation policy targets and implementation of NAP2030

The objective of the Climate Act and the climate policy planning system is to contribute to ensuring that national measures are taken to adapt to climate change by promoting climate change resilience and the management of climate risks.

Finland's National Climate Change Adaptation Plan until 2030 sets 24 targets and outlines actions to achieve them. The targets are divided into ten themes: 1) strategic planning and foresight; 2) comprehensive security and general security of supply; 3) food and nutrition security; 4) infrastructure and the built environment; 5) use and management of renewable natural resources, biodiversity, nature-based solutions and drought risk management; 6) health protection and promotion; 7) cultural heritage and the cultural environment; 8) climate risk management at the regional and municipal levels; 9) international cooperation; 10) knowledge base, communication and monitoring. NAP2030 also contains four themes that require further preparation: the Sámi Climate Change Adaptation Programme, competence development, development of occupational safety and health, and public procurement.

The proposal for a strategic LIFE project (KISS LIFE), prepared under the coordination of the Natural Resources Institute Finland, advanced to the second phase of the call, and the completed KISS LIFE application was submitted to the Commission for evaluation in early 2025. The KISS LIFE project aims to ensure significant EU funding for the extensive implementation of NAP2030 actions starting from 2026.

The following presents their implementation status specifically for each target, with a special focus on status relative to the baseline since the submission of the 2024 Annual Climate Report.

National-level strategic planning and foresight

There are two targets under the national-level strategic planning and foresight theme.

Implementation status of the national-level strategic planning and foresight theme

Target: Adaptation is integrated into the Government's and ministries' strategic planning and foresight by 2030.

Implementation in 2024: The Government's foresight work, such as the Report on the Future and the ministries' work on the future, takes into account the impacts and risks associated with climate change.

Target: Administrative branch-specific adaptation action will be based on plans and the conditions to implement it will have been secured by 2030

Implementation in 2024: A plan or action plan guiding adaptation in the administrative branch is in place in the Ministry of Agriculture and Forestry, the Ministry of Defence, the Ministry of Social Affairs and Health and the Ministry of the Environment.

The Climate Change Adaptation Action Plan for the Ministry of Agriculture and Forestry until 2027 was published in 2024. The action plan serves as a tool that provides guidance and communications on strengthening climate change adaptation in the administrative branch of the Ministry of Agriculture and Forestry.

The Action Plan for the Adaptation to Climate Change of the Environmental Administration will be updated during 2025.

For some ministries, such as the Ministries of Finance, Employment and the Economy, Foreign Affairs and Transport and Communications, adaptation planning is included in broader frameworks, such as corporate strategies or climate strategies.

Comprehensive security and general security of supply work

The target for comprehensive security and general security of supply work is that the consequences of climate change and preparedness for and adaptation to them will have been identified as part of comprehensive security and integrated into the comprehensive security model and the objectives of security of supply by 2026.

The updated Security Strategy for Society was published in early 2025. The strategy describes how the key functions of society are provided in collaboration between public authorities, businesses, NGOs and people. It explains which activities are vital, how to assess the risks associated with them, how to secure them through strategic tasks, and how the different actors are involved in this work. One of the strategic tasks assigned to the different administrative branches is to detect, monitor and combat climate change and the resulting threats and to prepare for change.

Implementation status of the targets of the comprehensive security and security of supply work theme

Target: The consequences of climate change and preparedness and adaptation to them will have been identified as part of comprehensive security and integrated into the comprehensive security model and the objectives of security of supply by 2026.

Implementation in 2024: The updated Security Strategy for Society was published in early 2025.

The Government Decision on the Objectives of Security of Supply was adopted in 2024. The decision on security of supply has clearly highlighted the risks associated with climate change and the importance of adaptation measures to prepare for climate risks and improve the resilience of society.

The Finnish Institute of International Affairs and the National Emergency Supply Agency published a situational picture report on the compounding and transition impacts of climate change on Finland's security of supply. The report looks at six sectors: food supply, energy supply, finance and the economy, logistics, manufacturing and healthcare. All of these sectors involve climate impacts critical to security of supply. The Climate Change and Finland's Security of Supply (ILHU) project (2023–2026) project will produce more detailed information on impact chains related to food and energy production and critical materials, for example, and ways to prepare for them.

In August 2024, the Ministry of the Interior and the Ministry of Finance launched a major study on the need to develop regional preparedness cooperation and situational awareness. The results of the project will be available in August 2025.

The STOPPI project, commissioned by CMC Finland, developed skills relating to climate change among internal security staff in the administrative branch of the Ministry of the Interior. Among other things, the project developed the capacity and capability of the administrative branch to identify direct or indirect threats to internal security from climate change and produced an analysis tool to help officials identify and analyse the impact of climate change, environmental degradation and biodiversity loss on the branch's duties.

Food and nutrition security

The targets for the food and nutrition security theme are that the operating conditions of agriculture to adapt to climate change are enhanced by 2030 and that climate-resilient food production and consumption maintain food and nutrition security throughout the NAP2030 period. In agriculture, climate change mitigation and adaptation measures are closely interlinked.

Implementation status of the targets of the food and nutrition security theme

Targets: The operating conditions of agriculture for climate change adaptation will have developed by 2030.

Climate-resilient food production and consumption will maintain food and nutrition security throughout the NAP2030 period.

Implementation in 2024: Adaptation of agriculture to climate change is promoted as part of Finland's CAP Strategic Plan up until 2027.

Climate change adaptation measures, including to reduce the risks of plant pests and animal diseases, are being promoted in accordance with the Climate Change Adaptation Action Plan for the Ministry of Agriculture and Forestry.

Infrastructure and the built environment

There are four targets under the infrastructure and the built environment theme, relating to water services, transport and communications infrastructure, the built environment, energy infrastructure, industry and businesses.

Implementation status of the infrastructure and the built environment theme

Target: The preparedness of water services for climate change impacts will have been improved by 2026.

Implementation in 2024: The first round of consultations on the Government's draft proposal to reform the Water Services Act ended on 30 September 2024. The preparation of the Water Services Act continued and the Government submitted its proposal to Parliament on 30 April 2025.

The Adaptation to Climate Change in Water Services (VILSO) project was launched at the beginning of 2024. The project aims to create an open, free tool for water utilities to review the adaptation needs brought about by climate change in their own operations and to plan adaptation measures for each utility.

Target: The vulnerabilities of the transport and communications infrastructure will have been identified by 2026 and climate resilience will have been improved by 2030.

Implementation in 2024: The National Transport System Plan (Transport 12) is currently being updated. The plan's objectives for transport performance, safety and sustainability also include adaptation to climate change. Climate change adaptation measures have also been promoted in the Finnish Transport Infrastructure Agency's operational risk assessment, vulnerability reviews of the transport infrastructure network, preparedness and contingency planning and management reviews. The Finnish Transport and Communications Agency Traficom has identified risks and vulnerabilities in the communications infrastructure and has developed their monitoring.

Target: The built environment sector will have the capacity and capability to manage climate change-related risks and to adapt to changes taking place in the climate by 2030.

Implementation in 2024: A reform of the Land Use Act is underway. Public consultation on the Government Proposal for a new Land Use Act was completed on 11 July 2025.

The draft law includes adaptation to climate change in spatial planning.

Climate change mitigation is reflected, for example, in life-cycle assessments of construction and renovation and in the circular economy obligations imposed on building materials. Design and implementation must therefore be based on life-cycle sustainable, energy-efficient, socially and environmentally sound solutions.

The Building Act entered into force on 1 January 2025 and is designed to combat climate change. The Building Act provides for issuing decrees on essential technical requirements, which will take into account the impacts of climate change.

A new Civil Engineering Act covering public areas and stormwater is being drafted and the draft sections will take adaptation into account. The Government aims to submit its proposal to Parliament during 2026.

The Finnish Meteorological Institute and the Finnish Environment Institute have published a guide to support climate-resilient urban planning as part of the EU-funded CANEMURE project. The guide is designed to promote climate change mitigation and adaptation in land use planning, spatial planning and construction.

Use and management of renewable natural resources, biodiversity, nature-based solutions and drought risk management

There are four targets for the use and management of renewable natural resources, biodiversity, nature-based solutions and drought risk management theme.

Implementation status of the use and management of renewable natural resources, biodiversity, nature-based solutions and drought risk management theme

Target: Climate change adaptation in the use of renewable natural resources will have improved by 2030.

Implementation in 2024: In 2024, the Natural Resources Institute Finland published a report on the impacts of climate change and extreme weather events on nature and natural resources management. Based on research, the report summarises how climate change and extreme weather events affect nature and natural resources management.

The Ministry of Agriculture and Forestry, the Natural Resources Institute Finland and the Finnish Forest Centre have collaborated to prepare a draft for a new national preparedness plan for forest damage. The plan identifies the main

causes of damage to commercial forests, the contingency preparations and the responsibilities of the various Parties. The preparedness plan will be complemented by more detailed contingency plans for the most serious damage agents, such as European spruce bark beetles and forest fires.

The Act on a Temporary Forestry Incentive Scheme entered into force at the beginning of 2024. The reformed Forestry Incentive Scheme will contribute to supporting climate change adaptation in forestry.

Climate change is estimated to affect the status of water bodies through warming water bodies and increasing nutrient loads, among other things. The Finnish Environment Institute, in collaboration with the ELY Centres, has published a new open spatial data set of water bodies that have been interpreted as sensitive or particularly sensitive to the impacts of forestry. Information is available on the ecological classification of water bodies, water residence time, and the amount of oxygen, colour and chemical oxygen demand near the bottom.

Target: Adaptation to climate change and halting biodiversity loss will be mutually supportive by 2030.

Implementation in 2024: The joint Helmi Habitats Programme of the Ministry of the Environment and the Ministry of Agriculture and Forestry has improved the status of mires, aquatic bird habitats, semi-natural grasslands and wooded pastures, forests, small water bodies and coastal habitats. The programme also aims to mitigate climate change and promote climate change adaptation. Programme measures in 2024 included mire restoration in government and private protected areas covering a total of 1,271 hectares and landowners' voluntary protection of mires covering 4,672 hectares.

Last year, the METSO programme protected a total of around 3,200 hectares of forest habitats, including around 2,900 hectares of permanently protected forest and 260 hectares covered by ten-year environmental aid agreements. In addition, around 20 hectares of forests were set aside for a period of eighty years. The area covered by nature management works was about 200 hectares. The final evaluation of the METSO programme was completed in early 2025. A working group of the Ministry of the Environment and Ministry of Agriculture and Forestry is preparing the next period of the programme that will start in 2026. The preparation of the National Restoration Plan was launched as a broad-based expert effort.

In 2024, the Ministry of the Environment continued the preparation of the National Biodiversity Strategy and related Action Plan. The strategy aims to contribute to improving the policy coherence of the adaptation measures of the different administrative branches concerning biodiversity.

Target: Nature-based solutions will have become established and will have increased society's preparedness for climate risks, improved water protection and at the same time increased biodiversity by 2030.

Implementation in 2024: Jointly prepared by the Ministry of Agriculture and Forestry and the Ministry of the Environment, the Roadmap for Catchment-based Planning was published in January 2024. Catchment-based planning can be used to coordinate different water management objectives, including flood and drought risk management.

The implementation of the roadmap and the deployment of catchment-based planning was promoted by means such as training courses and a basic course on catchment-based planning published on the eOppiva learning platform. The target group for the training includes landowners.

Target: Drought risk management will have developed from the 2022 situation by 2030.

Implementation in 2024: The National Guidelines for the Management of Drought Risks were published in 2024. The guidelines guide the management of drought risks in Finland and list means to promote risk management. The management of drought risks is composed of early warnings and indicators, vulnerability and risk assessments and risk management and preparedness plans. Vulnerability and risk assessments help to identify risk areas and offer an overall picture of drought risks in Finland.

Flood risk management will be implemented in six-year cycles in conjunction with river basin management planning. On 19 December 2024, the Ministry of Agriculture and Forestry designated significant flood risk areas in river basins and along the coast on the basis of proposals from the ELY Centres. The proposals were based on a preliminary assessment carried out in all Finnish river basins and coastal areas. The significance of flood risk is assessed taking into account the likelihood of flooding, the potential adverse consequences and regional and local conditions. Regional Flood Groups were also set up in major flood risk areas to determine

and monitor flood risk management objectives and measures and to organise cooperation between authorities in the preparation of flood risk management plans.

The latest flood risk assessment did not identify any new significant risk areas. Conversely, four of the previously designated risk areas no longer met the criteria for a significant flood risk area. The elimination of significant flood risk areas is a good indicator of the effectiveness of risk management.

Health protection and promotion

The target for the health protection and promotion theme is that health hazards from heat will have been recognised and adaptation to them at the various levels as well as monitoring will have developed by 2030. Maintaining high housing standards and a basic water services infrastructure supported by energy supply is essential for health protection. Effective healthcare will enable the monitoring and treatment of new infectious diseases that may emerge as a result of climate change. Preparedness for and adaptation to other health risks relating to climate change is strengthened by the Climate Change Adaptation Plan of the Ministry of Social Affairs and Health adopted in 2021.

At the end of 2024, preparation of the National Action Plan for the prevention of negative health impacts from heat in Finland was launched under the leadership of the Ministry of Social Affairs and Health. The plan will help protect vulnerable groups during heatwaves, prevent severe health impacts, reduce society's vulnerability to heat stress and contribute to adaptation to climate change. The draft plan is due to be completed by the end of 2025.

In 2024–2026, the Finnish Institute for Health and Welfare and Tampere University will implement an ERDF-funded project to collect and share good practices of health and social services organisations on climate change adaptation, mitigation and heat risks, produce measurement data on heat risks and develop a monitoring model for climate change adaptation. The results of these projects will be utilised by the Ministry of Social Affairs and Health in the updating of the Housing Health Decree under NAP2030 due to take place in the next few years. Climate change and health are also discussed in Chapter 6.

Cultural heritage and the cultural environment

This theme comprises four targets related to developing competence and ensuring resources for the management of cultural heritage and the cultural environment; assessing the impacts of climate change; strengthening the sector's participation in climate change adaptation policies; and using knowledge related to the theme to inform adaptation solutions.

Cultural heritage provides concrete solutions that can be taken into use and applied in climate change adaptation. Good management of the cultural environment, traditional working methods and know-how relating to a sustainable lifestyle can help to curb climate change and increase resilience against extreme weather events. The cultural environment and heritage increase national cultural resilience amidst crises. Due to the risks posed by climate change, cultural heritage and the cultural environment must be better documented digitally while ensuring the recording, monitoring, long-term preservation, interoperability and usability of the data.

Implementation status of the cultural heritage and the cultural environment theme

Target: The protection of cultural heritage and the cultural environment against the impacts of climate change will have improved, taking these into account in climate change adaptation policy will have been strengthened and the utilisation of knowledge included in cultural heritage and the cultural environment in adaptation-related solutions will have developed by 2030.

Implementation in 2024: The Government submitted a cultural policy report to Parliament in November 2024. The measures in the report include integrating cultural perspectives into climate policy and biodiversity safeguarding measures. The report's implementation plan will specify the target schedules and Parties responsible for the measures.

The Ministry of Education and Culture and the Ministry of the Environment are involved in the preparation of the European Partnership for Resilient Cultural Heritage. The partnership will strengthen sustainable development, risk management and crisis resilience through research on cultural heritage and the solutions to be developed. The partnership is part of the Horizon Framework Programme.

The Häme ELY Centre has, with funding from the Ministry of the Environment, produced information on how municipalities in particular can assess the overall sustainability of decisions related to the development of the built environment.

In 2024, the ERDF-funded Cultural Heritage and Climate Change project was launched, with the Governing Body of Suomenlinna as the main implementer.

In 2024, the Ministry of Education and Culture awarded project grants for the digitisation of museum collections, development of interoperability of cultural environment data and development of the Finnish Heritage Agency's archaeological service portal. Interoperability will promote the digitisation of cultural environment data and its accessibility in the built environment information system. The development of information management will support preparedness, since integrated calculation and monitoring data can help to identify protected sites located in a flood risk area, for example.

The quality of cultural environment data is being developed under the leadership of the Ministry of the Environment and the Ministry of Education and Culture.

Climate risk management at the regional and municipal levels

The managing climate risks at regional and local level theme promotes targets to develop competence; improve guidance of municipalities and regions; and promote access to adaptation funding opportunities and monitoring of funding.

At the regional level, the Centres for Economic Development, Transport and the Environment (ELY Centres) play a key expert and official role in adapting to climate change, producing and managing relevant information, and translating national plans into practical action.

The National Climate Unit established at the Centre for Economic Development, Transport and the Environment for North Ostrobothnia, is responsible for, among other things, regional coordination, monitoring and promotion duties relating to NAP implementation. Its work has an emphasis on actions relating to the regional and municipal targets for climate risk management, but there are also measures under the other NAP targets that require actions by regional actors. A key role of the Climate Unit is to disseminate information on adaptation planning and existing information sources and tools to regional actors.

The National Climate Unit provides regional- and municipal-level actors with expert assistance in the planning of adaptation measures and develops interactive network cooperation and an adaptation training package to increase professional competence. The National Climate Unit also supports experts of the various Centres for Economic Development, Transport and the Environment in conveying adaptation information.

Implementation status of the climate risk management at the regional and municipal levels theme

Target: Regional and municipal actors will have access to the guides and guidelines as well as the competence to make use of them in planning concerning the various sectors by 2030.

The adaptation-related guidance and direction of the regions and municipalities will be consistent and appropriate by 2030.

Funding opportunities will encourage regional- and municipal-level actors to strengthen adaptation action and the monitoring of the allocation of funding will be possible by 2030.

Implementation in 2024: The ELY Centres' National Climate Unit is developing an adaptation expert service package to respond to the various information needs of the regions and municipalities in identifying climate risks and planning adaptation measures. In early 2025, a report on rainfall preparedness for heavy rainfall commissioned by the Finnish Meteorological Institute was published, providing information for municipal planning, urban planning and construction. A regional climate cooperation workbook was also published.

The open version of the online tool produced in the ELY Centres' national climate action development project was published in March 2024. The tool has identified the adaptation interfaces of the ELY Centres' statutory tasks. The project has also trained the ELY Centres' staff to strengthen their adaptation competence.

A constantly updated list of funding opportunities for climate risk reduction, preparedness and adaptation is published on the Climate Unit website. The list is specifically targeted at regional and municipal actors.

The specific climate change adaptation, risk prevention and disaster preparedness and resilience target

is included in the Carbon Neutral Finland theme of the European Regional Development Fund (ERDF). Around 60 ERDF-supported projects funded under this specific objective were underway in the spring of 2025.

The European Agricultural Fund for Rural Development (EAFRD) supported around 34 regional projects underway in spring 2025, promoting actions including the adaptation of agriculture and forestry and, more broadly, rural areas and communities to changing climate conditions.

The EU Mission on Adaptation to Climate Change promotes adaptation at regional and municipal levels. It is one of the five missions of the EU's Horizon Programme, which aim to tackle global challenges. The Mission aims to increase the understanding of climate risks and develop adaptation measures especially at the regional level.

In Finland, the Charter of the Mission on Adaptation to Climate Change has been signed by seven regional councils (Kanta-Häme, Kymenlaakso, Lapland, Ostrobothnia, Päijät-Häme, Uusimaa and Southwest Finland) and by four cities (Espoo, Tampere, Turku and Vaasa). The Mission provides these regions with support in identifying vulnerabilities and risks and planning adaptation measures. The Mission targets are in line with those of the National Adaptation Plan.

The Commission has encouraged Member States to promote action under the Mission with national resources, too. Launched in 2023, the Adaptation Mission Network serves as a platform for peer learning and exchange of experience, enable a faster flow of information from research projects to adaptation planning in municipalities and regions, and develop cooperation with businesses and organisations. So far, 300 people have joined the network.

The network of the Mission on Adaptation is open to representatives of regions, municipalities, joint municipal authorities, wellbeing services counties, research institutes and others working in climate change adaptation. The National Climate Unit of the ELY Centres coordinates the network's activities under the guidance of the Ministry of Agriculture and Forestry and the Ministry of the Environment. Through the network, information on adaptation webinars, new tools and other resources is also disseminated to regions and municipalities that are not signatories to the Mission Charter.

Preparations to adapt to climate change are underway in several regions. In Kymenlaakso, for example, a comprehensive adaptation plan is being prepared with support from the Horizon-funded Pathways2Resilience project. Lapland's

new Energy and Climate Strategy will produce a risk and vulnerability review and scenario information on climate change. The VILKKU project completed a situational picture of vulnerability, exposure and key risks in Uusimaa during 2024. A regional adaptation plan is also being prepared in South Ostrobothnia.

A monitoring tool was developed for Päijät-Häme municipalities to evaluate adaptation measures. The tool allows municipalities to outline practical adaptation measures and monitor the level of adaptation in their own municipality. The themes are energy, transport, water services, flooding and stormwater, forests, heat island effects, green spaces and buildings. The tool provides visual and clear information to municipal employees, decision-makers and stakeholders on the progress and future actions of climate change preparedness.

The tasks important for climate change adaptation in healthcare and social welfare services and rescue services were transferred to the wellbeing services counties from the beginning of 2023. By the end of 2024, three regions had developed a regional adaptation plan, either as a separate document or as part of a broader climate strategy. Eight regions were preparing or updating their plans.

The Ministry of the Interior is participating in the EU Mission-funded CLIMAAX project (CLIMAte risk and vulnerability Assessment framework and toolboX, 2023–2026). The project will create a toolbox for regional climate risk assessment and identification of climate risks relevant to regions. The project also includes a funding mechanism to develop tools and improve the climate change resilience of European regions. In spring 2025, the region of Southwest Finland received CLIMAAX funding to support its adaptation work.

The ELY Centres National Climate Unit has developed an adaptation training module for small and medium-sized enterprises. The training module was piloted in 2024 and will be continued in 2025 in different regions. The module video is available on YouTube. The Helsinki-Uusimaa region is developing a climate risk assessment tool for businesses together with the University of Helsinki.

International cooperation

The targets for the international cooperation theme focus on both strengthening international climate finance coordinated by the Ministry for Foreign Affairs and adaptation of developing countries as well as international cooperation funded by several ministries to strengthen Finland's adaptive capacity and weight in international arenas, and expand the knowledge base.

Finland supports adaptation to climate change internationally through Official Development Assistance (ODA) and its various instruments, including but not limited to:

- Multilateral funds such as the Green Climate Fund (GCF), Nordic
- Development Fund (NDF) and Systematic Observations Financing Facility (SOFF);
- Bilateral development cooperation projects in partner countries, Public Sector Investment Facility (PIF);
- Institutional Cooperation Instrument (ICI);
- Funding for civil society projects and programmes.

In 2023, Finland's international climate finance for developing countries amounted to EUR 172 million, 38% of which was for adaptation. In addition, Finland participates in the Risk-informed Early Action Partnership (REAP), an international partnership for adaptation.

Finnish adaptation expertise is actively exported. For example, the Finnish Meteorological Institute carries out several projects related to preparedness for extreme weather events and adaptation to climate change with funding from the Ministry for Foreign Affairs. Finland's funding and the expertise of the Finnish Meteorological Institute has helped the meteorological institutes of more than 50 developing countries to develop their weather and climate services and early warning systems.

The Finnish Transport Infrastructure Agency is actively involved in European and international climate change adaptation cooperation with organisations including the Conference of European Directors of Roads (CEDR), the International Union of Railways (UIC), the Platform for Rail Infrastructure Managers in Europe (PRIME), the World Road Association (PIARC) and the United Nations Economic Commission for Europe (UNECE). Development projects have examined the impacts of extreme weather events (including heavy rainfall, high temperatures) on road and rail infrastructure and developed methods for assessing risks and vulnerabilities and implementing climate change adaptation measures.

Finland supports and participates actively in adaptation research and development of adaptation knowledge in the Arctic, Barents and Baltic regions. Key cooperation mechanisms include the northern regional councils (Arctic Council, Barents Euro-Arctic Council and Council of the Baltic Sea States) as well as the Northern Dimension Partnerships.

Nordic cooperation will strengthen adaptation to climate change. In May 2025, Finland organised the 7th Nordic Adaptation Conference NOCCA2025 in Rovaniemi as part of Finland's Presidency of the Nordic Council of Ministers. The conference brought together nearly 200 researchers, experts and practitioners to share experiences on climate risks and risk management solutions in the Nordic countries.

Knowledge base, communication and monitoring

NAP2030 has three targets focusing on strengthening the knowledge base of climate risks and adaptation, communication and climate change adaptation, and monitoring of NAP2030. The target for strengthening the knowledge base is that the knowledge base relating to weather and climate change risks and adaptation will have been strengthened in a sensible manner, and the availability of research data to end users will have been ensured by 2027. Adaptation research takes place in many different research programmes, research institutes, universities and other higher education institutions. Examples from 2024 include the following:

- The Ministry of the Interior coordinates the national cooperation network for disaster risk management, with one of the aims being to collect and communicate information relating to disasters. The Network's mandate has been extended. A sub-working group of the Sendai Framework for Disaster Risk Reduction is preparing an approach to compiling national accident data.

- The 2035LEGITIMACY project of the Finnish Meteorological Institute has produced a visualisation tool that allows users to view customised information on the impacts of climate change up to 2040. The tool allows you to view the projected changes in your place of residence, compare them with the average changes in Finland and find out your personal vulnerability level.

- Regional and local actors' awareness of adaptation to a changing climate in natural resources sectors was raised through several events organised with the National Climate Unit of the ELY Centres and regional ELY Centres or other partners. Event participants shared information and discussed the benefits and drawbacks of climate change for agriculture and forestry and ways to adapt.

The target for the development of the monitoring of NAP2030 and, more broadly, of climate change adaptation is that *adaptation monitoring will be systematic and support the development of activities*.

- The final report of the Finnish Environment Institute's INDISEURA project was published in 2024. The project investigated the current status and development needs for the use of indicators for adaptation monitoring, in particular those for monitoring biodiversity and drought risk management. The project produced an assessment matrix for indicators, which was used in prioritising indicators for both of the themes. Findings from the project were applied during 2024 in a project funded by the Ministry of Social Affairs and Health and implemented by the Finnish Institute for Health and Welfare, which develops adaptation plan monitoring in the administrative branch of the Ministry of Social Affairs and Health.

- The Finnish Environment Institute's SOPUTIE project is developing adaptation monitoring and the availability of adaptation data. The project coordinates the preparation of the NAP monitoring system and takes part in and further develops adaptation reporting.

According to the relevant NAP2030 target, communication will have strengthened awareness among society's actors of risks and adaptation measures relating to climate change.

The extreme weather events of 2024 and the floods experienced in Finland were also reflected in the media and triggered adaptation activities and communication in different sectors, as the need to prepare for the impacts and risks of climate change became more concrete. During the year, plans were launched on how to strengthen interaction and awareness-raising between different actors in society in a more systematic way in the future.

The concept of the climate change newsletter was developed. The newsletter was published three times during 2024. In addition to current issues, studies and events in the different administrative branches, the newsletters covered progress on national and EU-level adaptation work, adaptation in the natural resource sectors, regional and local adaptation solutions and progress on the work. The national EU Adaptation Mission Network's LinkedIn group has served as an important informal platform for information sharing and networking.

The adaptation content of the climateguide.fi service that compiles climate change information was significantly updated and expanded during 2024. In addition, adaptation and communication about it were discussed in the meetings of the Steering Group for Central Government Climate Communications. Adaptation was also taken into account as a specific section in the design of the Climate

and Nature Barometers planned simultaneously for February 2025. Information on preparedness for climate change impacts and the NAP2030 plan was also communicated in the context of the National Guidelines for the Management of Drought Risks, the Commission Communication on Climate Risks, the Roadmap for Catchment-based Planning and communication on the adaptation plans of the administrative branches.

6 Climate action and health – how can these be promoted at the same time?

Climate change has health impacts

Heatwaves are the most significant cause of health impacts of climate change in Finland

The increasing frequency and intensity of heat waves due to climate change will have a negative impact on health. In addition to mild effects such as fatigue and weakness, heatwaves also cause serious adverse health effects in the form of increased hospitalisation and premature mortality, especially among older adults. A nationwide heatwave lasting several weeks could result in several hundred hospitalisations and deaths in Finland. As climate change progresses, serious health effects could multiply. The risk of damage is increased by an ageing population, urbanisation and denser urban structures.

Urban residents are most adversely affected by hot spells. Due to the so-called heat island effect, temperatures are higher in the densely built-up area than in the surrounding countryside, especially in summer. Urban buildings and asphalt and stone surfaces store more heat than undeveloped areas and release it at night, when urban temperatures cool more slowly than in rural areas.

Climate change may increase the risk of accidents on the move

Climate change is expected to affect the slipperiness of winter roads. In particular, the weather fluctuating above and below 0°C increases the risk of slip and fall and traffic accidents. Climate change in southern Finland is expected to shorten the winter season but increase the number of slippery zero temperatures. In eastern and northern Finland, the weather is also expected to fluctuate more frequently above and below zero.

Climate change may affect healthcare

It is not only patients who are affected by the heatwaves, but also healthcare staff, their working conditions and the delivery of services. At the same time, an ageing population and the infrastructure maintenance backlog are creating challenges and increasing vulnerability in healthcare. Healthcare depends on other infrastructure, such as a functioning road network, water, electricity and food supply and waste

management. Extreme weather events can cause power cuts or disrupt the operation of water utilities, for example. In addition, electricity and road traffic disruptions may jeopardise patient transport. The availability of medicines and medical supplies or devices may be affected by disruptions in global supply chains. Ensuring that other infrastructure adapts and functions properly is important for the reliability of healthcare.

Other health effects

Climate change allows the geographical range of vector-borne diseases to expand. As a result, diseases such as tick-borne borreliosis and encephalitis may become more prevalent. Water-borne epidemics linked to heatwaves, heavy rains and floods may become more common due to contamination of drinking water, both from water utilities and private wells. In addition, hot spells can increase pathogens in bathing waters and the diseases transmitted by them. Rainy and cloudy winters with little snow can cause mental health problems because of the lack of light. Concerns about climate change can also increase or worsen mental health symptoms.

Preparing in advance for climate change impact

Preventing the adverse health effects of heat requires preparedness and adaptation measures at national, regional and local levels. Action is needed not only in healthcare and social welfare, but also in other sectors such as construction and urban planning. As the climate warms and the population ages, the need for preparedness and adaptation will continue to grow. Indeed, Finland needs to develop heat-related warnings and communications, as well as preparedness guidelines and policies. In February 2025, the Ministry of Social Affairs and Health set up a working group to prepare a national action plan for the prevention of negative health impacts from heat in Finland.

During heatwaves, protection should be provided, especially for people at risk, such as older adults, chronically ill patients and young children, to prevent serious health effects. Preventing indoor overheating is particularly important in care and nursing homes, older people's homes, daycare centres and schools.

In the long term, urban heat island effects can be mitigated through urban design, such as the placement of structures and choice of materials, and increased urban landscaping. In addition to ventilation and cooling systems, the thermal conditions of buildings are influenced by factors such as the orientation and shading of the

building and windows. Urban landscaping design can combine the promotion of climate change adaptation, health and restoration planning to achieve a wide range of benefits at the same time.

Slip and fall accidents and other incidents can be prevented by taking account of changing conditions in road and pavement maintenance. Slipping when outdoors can be prevented by wearing the right shoes and non-slip shoe grips and by following the Finnish Meteorological Institute's warnings about slippery walking conditions. In addition, maintaining general physical fitness and balance, especially in old age, helps prevent slips and falls.

Climate change mitigation is also good for health

Climate change mitigation activities have direct health benefits in terms such as preventing the adverse effects of heatwaves. In addition, active modes of mobility – cycling, walking and public transport – and plant-based diets that meet nutritional recommendations contribute to both human health and wellbeing and to climate change mitigation. Their implementation also involves economic benefits, although comprehensive estimates of the economic benefits of healthy and sustainable lifestyles based on Finnish studies are still scarce.

Mobility

In Finland, just under half of men and just over a third of women take the recommended exercise, while almost half of short journeys of less than three kilometres are made by car. More than half of the respondents to the Healthy Finland Survey mainly drive to work or study on a daily basis, while less than a fifth cycle or walk. Physically active walking and cycling to school and work are an important part of everyday mobility and have a number of positive health benefits. Active exercise can, among other things, reduce sick leave rates.

By shifting from motorised to active modes of mobility for everyday urban journeys, it would be possible to reduce emissions while also achieving health benefits. Good urban design, such as attractive walking and cycling routes, well-functioning public transport infrastructure and affordable tickets, will promote active transport and reduce car dependency in areas. Walking and cycling are also encouraged by reasonable distances to schools or workplaces and urban bike-sharing schemes. These may need to be complemented by measures to restrict car use, such as congestion and parking charges, or to close some areas to car use.

Nutrition

National nutrition recommendations encourage a variety of plant-based diets that benefit both the health of the population and the environment. However, the recommendations are poorly adopted by the population. Poor food choices are currently responsible for almost as many deaths as tobacco, alcohol, physical inactivity and air pollution combined. Current food production and consumption also have significant adverse climate and environmental impacts.

Realisation of the nutrition recommendations, and the associated health and climate benefits, requires cooperation between different actors and sectors. Food education, nutrition counselling and communication play an important role in promoting healthy eating habits and a plant-based food culture. Education professionals, experts, policymakers, organisations, the media and food sector stakeholders such as producers, industry, trade and public food and catering services can all support these objectives. For example, food and catering services need to update food purchases, recipes and menus to reflect the new recommendations.

7 Costs of inaction

Climate change increases economic risks globally

Climate change has been identified as one of the biggest economic risks in the medium and long term. According to the European Environment Agency, climate change will cause an average loss of 19% of income to the global economy over the next 26 years compared with a situation without climate change. Income loss of this magnitude outweighs the costs arising from climate change mitigation. The estimated income loss may also increase strongly if no emissions reduction measures are taken.

It is in Finland's and the EU's interest to get other countries to act to combat climate change. When Finland takes climate action and achieves its targets as part of the EU, Finland's position in international negotiations will be stronger. Smooth international climate cooperation means that Finland benefits from multilateral emission reductions, which are a prerequisite for combating global climate change. Commitment to climate policy strengthens Finland's reputation as a responsible leader and attracts investment and interest in Finnish technology. By working together, Finland will also have access to the innovations and know-how of other countries, which will boost the development of climate action and technologies globally.

Unchecked climate change weakens Finland's economy

In October 2024, the Ministry of Finance assessed the long-term impact of climate change on public finances as part of the analyses prepared in support of the economic forecast. The analysis concludes that if climate change mitigation fails and the Paris Agreement is not reached, Finland's economic growth will slow down. A slowdown in growth will lower the future level of general government revenue in monetary terms, increase the expenditure-to-GDP ratio and lead to a further increase in the debt-to-GDP ratio. The faster the temperature rises, the more the debt-to-GDP ratio increases: in the worst-case scenario, the debt-to-GDP ratio would rise by 30% by 2070 compared with the baseline. On the other hand, if the Paris Agreement target is met, Finland's debt-to-GDP ratio could fall. This is due to the acceleration in GDP growth compared with the baseline. The Ministry of Finance's review highlights the importance of swift and decisive climate action to mitigation of climate change impacts and, consequently, to economic development.

Costs can be avoided by promoting active adaptation measures

Failure to take action to adapt to climate change will increase costs in the future. Extreme weather events, as well as flooding and reduced ground frost, damage infrastructure and therefore lead to direct costs, for example, due to shortening the life of buildings and the deterioration of forest roads, making it more difficult to harvest timber. A warmer and more humid climate threatens to increase the cost of mould damage in Finland, among other things. There are also costs in terms of deteriorating working conditions and productivity. In addition, agriculture and forestry are vulnerable to insect and weather damage and the spread of plant diseases. Concrete impacts on public health are discussed in Chapter 6. However, the costs of climate change impacts can be mitigated if adaptation measures are actively promoted.

The economic benefits of tackling climate change can be measured

The social cost of carbon (SCC) is an estimate of the economic damage caused by the release of one extra tonne of carbon dioxide (CO_2) into the atmosphere. The price of SCC is based on modelling future climate damage and its monetary assessment. The models take into account various factors such as economic growth, demographic trends, technological changes and the physical impacts of climate. Given the uncertainty of future conditions and the impacts of climate change, there is considerable fluctuation in the estimates. The modelling tools and assumptions used also affect the resulting SCC price.

The SCC is used in decision-making to assess the benefits of emission reductions. By putting a monetary value on the adverse effects of emissions, governments, businesses and others can assess the costs of emission reduction measures against the benefits of avoided damage. Finland has not defined an SCC to be used for climate policy planning; in the US, for example, a value of $51/t CO_2 has been used, but updated scientific information has suggested a value of $185/t CO_2 for SCC.

The costs of inaction include lost benefits

Failure to take climate action now will increase the need for action in the future. A stable, predictable policy by means such as carbon pricing means a predictable policy environment and avoiding sudden, large-scale interventions or significant price increases. In addition, carbon pricing, if properly designed, will generate tax revenue for the state, either in the form of carbon tax revenues or the proceeds from auctioning emission allowances.

The final report of the Room for Growth project underlines that investments in a clean, green transition offer significant economic benefits. These measures aim to promote Finland's economic growth and competitiveness and to improve the self-sufficiency of the energy system. The use of renewable energy sources, circular economy solutions and renewal of industrial structures create new investment opportunities. This will help to support growth companies and increase the circulation of domestic capital, which will support GDP growth in the long term.

Increasing clean energy production will reduce the use of fossil fuels, which in turn will improve the energy system's self-sufficiency and competitiveness in international markets. The Room for Growth report stresses that growing the end market for clean transition products in Europe offers new opportunities for industrial investment. This will promote economic reform based on increased investment and RDI, which will support Finland's strategic position both at national and EU level. The report points out that, while the initial phase of the green and clean transition will require significant investment and thorough preparation, the long-term effects will be positive. These measures will support economic growth, improve energy security and environmental safety and strengthen Finland's position in global markets.

Appendices

Appendix 1. Statistics and scenarios used

The data on emissions and removals presented for 2005–2023 in the Annual Climate Report is in accordance with Finland's official greenhouse gas (GHG) inventory and calculated according to the IPCC Methodological Guidelines. Statistics Finland is responsible for the GHG inventory, and the methodological descriptions concerning the reporting are included the annual inventory reports of Statistics Finland. Statistics Finland, the Natural Resources Institute Finland and the Finnish Environment Institute are responsible for producing sector-specific emissions and removals data and other data required for inventory reporting, and for developing inventory calculation and reporting. Calculation methods are constantly being developed and updated output data is being added to the calculation, which can lead to retrospective changes in emissions and removals data.

The 2024 data is proxy estimate data. Proxy estimate data is calculated at a rougher level and methodology than the actual inventory calculation. The proxy estimate data is therefore not final, and emissions data will be specified when all the data used in the calculation is completed. In particular, the proxy estimate data for the land use sector's net sink may differ considerably from the result subsequently calculated from revised baseline data. Updates and revisions to the baseline data include logging, timber stock, area and tree cover.

Effort sharing sector emissions are calculated by deducting verified emissions from installations covered by the general emissions trading system (ETS1) from the total emissions of the national greenhouse gas inventory (excluding the LULUCF sector). Carbon dioxide emissions from domestic aviation are also deducted from the emissions, as the EU ETS coverage and calculation method for aviation differ from the inventory calculation method. in other words, the effort sharing sector covers all of the greenhouse gas emissions not included in the emissions trading system and the land use sector that are reported in the national emissions inventory. After the adoption of the proxy estimate data in the effort sharing sector, the data will be updated, for example, on the exact amounts and destinations of fuel use and on the basis of the latest area data for the agricultural sector.

Further information on the LULUCF sector

Some emissions and sinks in the LULUCF sector may vary from year to year. The main variation between years is due to fluctuations in forest harvesting levels, which depend on the demand for wood and the production structure of the forest industry. Smaller inter-annual variations result from weather conditions and land use changes.

The impact and knowledge base of measures in the LULUCF sector involve greater uncertainties than in other sectors, which is due to a number of factors. Assessment of emissions and removals from the LULUCF sector includes the combined effects of a number of natural, technical and anthropogenic uncertainties. Data is collected from a variety of sources, including direct measurements, satellite images and statistical models. Reconciling these data types increases uncertainties, even if the result obtained by a single method were accurate. The measurement and estimation methods used in the GHG inventory are constantly being improved to produce higher accuracy.

The retrospective revisions to the LULUCF sector inventory are generally larger than in other sectors, which was also reflected in the early 2025 GHG inventory release compared with a year ago. The estimates for the most recent years will typically become more accurate when further data on details such as the growing stock and its increment and surface areas in different land use categories is available from the National Forest Inventory according to its inventory cycles, since these details have a significant impact on assessment of GHG balances.

The biggest change in the statistics published in 2025 compared with the previous year is the refinement of the knowledge base, which reveals forest land as a source of emissions. The calculation made use of the entire five years of data from the 13th National Forest Inventory. The most significant change to the latter years of the time series came from an update to the growing stock biomass coefficients based on this data and the multiplier effects of this change on growing stock and soil carbon balances. More accurate data on the growing stock had a lowering effect on carbon accumulation in the soil, including forest litter. The shortened tree crowns observed in the field are one factor that reduced the carbon sink of the forest growing stock compared with the previous situation.

For the 2025 inventory results, the calculation made use of new area data for agricultural land from a project entitled Advanced Spatial Data on Agricultural Peat Soils in Finland. An emission factor for nitrogen fertilisation was introduced for forest land in line with the latest IPCC Inventory Guidelines from 2019. The calculation of wetland land use category was improved by including reservoirs and

other heavily modified water bodies in accordance with the latest IPCC Guidelines, using data from the Finnish Environment Institute. An error in the calculation of emissions from peat production areas was also corrected. Emissions from nitrogen fertilisation in settlements were included in the inventory as a new source of emissions.

In total, the inclusion of new data and calculation changes resulted in an increase of 7.6 million tonnes of CO_2-eq calculated for the whole sector for 2022 compared with the inventory data published in March 2024. For forest land, the impact was 7.5 million tonnes of CO_2-eq, most of which was explained by updating the biomass calculation of the growing stock to align with more accurate growing stock data.

Table 11. Forest land inventory data for 2022 based on inventory data published on 30 May 2024 and 14 March 2025 (Mt CO_2-eq). DOM = dead organic matter; SOM = soil organic matter.

	Data as at 30/5/2024	Data as at 14/3/2025
4Ai1 Forest land: biomass (mineral soils)	-2,820	-3,346
4Ai2 Forest land: biomass (organic soils)	-9,751	-6,467
4Aiv Forest land: DOM + SOM (mineral soils)	-4,751	0,608
4Av Forest land: DOM + SOM (organic soils)	10,119	9,551
4(i)A Forest land: N_2O emissions from nitrogen fertilisation	0,005	0,009
4(ii)A Forest land: emissions and removals from drainage and rewetting	2,425	2,355
4(iii)A Forest land: N_2O emissions from nitrogen mineralisation associated with loss of soil organic matter in mineral soils	0	0,060
4(iv)A Forest land: biomass burning (wildfires, prescribed and restoration burnings)	0,001	0,001
Total	**-4,772**	**2,771**

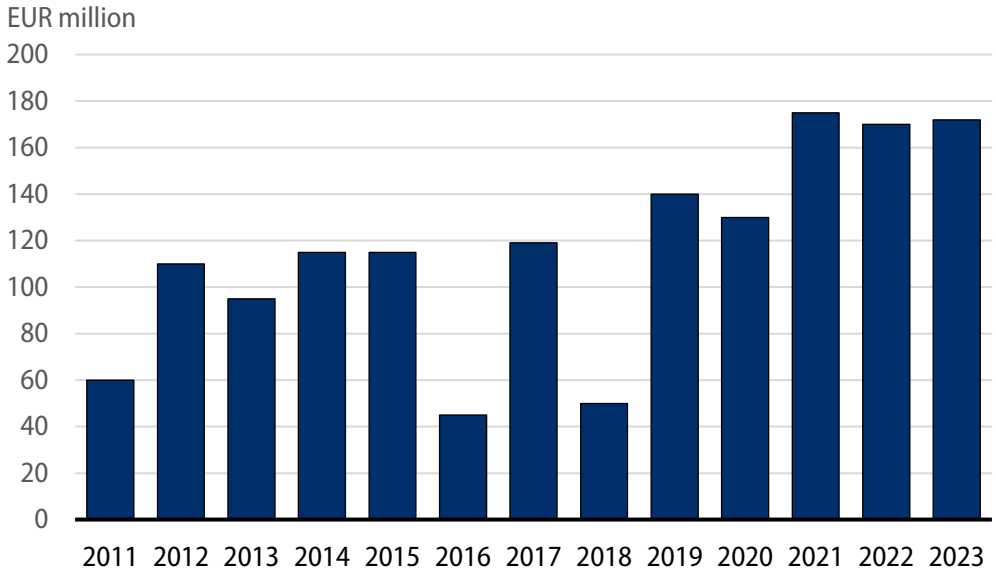
Scenarios used

The estimates presented in the Annual Climate Report on the achievement of the emissions reduction targets are based on scenario calculations. A scenario is a calculated estimate of how emissions will develop if the assumptions that formed the basis for the calculation come true. Scenario calculation is subject to continuous updating and development, and the aim is to take factors influencing emissions trends as comprehensively as possible. Scenario calculation typically utilises mathematical models. The estimates presented in the Annual Report on meeting the emission reduction targets are based on the baseline (WEM) and policy (WAM) scenarios developed in the KEITO project of VTT Technical Research Centre of Finland. The baseline scenarios were defined taking into account the energy and climate policy decisions implemented during the term of Prime Minister Sanna Marin's Government by 31 March 2023. As regards EU climate and energy policy, the scenarios take account of decisions made, such as the implementation of the Fit for 55 package. The policy scenario also takes into account the effects of the actions of current Prime Minister Petteri Orpo's Government on the level of emissions. Updated policy scenarios were developed to support quantification in the preparation of additional measures.

Appendix 2. Finland's international climate finance in 2023

Finland channels its climate finance – that is, supports activity where climate benefits are the main objective or a significant subobjective – through several different development cooperation channels from civil society organisation projects to development banks. Since data for each year is not completed until the autumn of the following year, this Annual Climate Report reports on 2023. In 2022, Finland's public climate finance channelled to developing countries totalled around EUR 172 million. This also took account of other official flows (OOF) of climate finance outside development cooperation funds, totalling just under EUR 15 million. Of the support, 62% was allocated to mitigation and 38% to adaptation.

Figure 25. Finland's climate finance payments (EUR million) in 2011–2023.
Source: Ministry for Foreign Affairs.



The policy of the previous two Governments allocating development policy loan and investments in climate action is reflected in the statistics. Grant-based cooperation accounted for just over half of climate finance in 2023, while the other half was channelled through investments and loans and the Finnish State-owned development finance institution, Finnfund.

Appendix 3. Sector-specific indicators

Energy and industry

Figure 26. Emissions from industrial processes 2005–2024. *The 2024 data is instant preliminary data. Source: Statistics Finland.

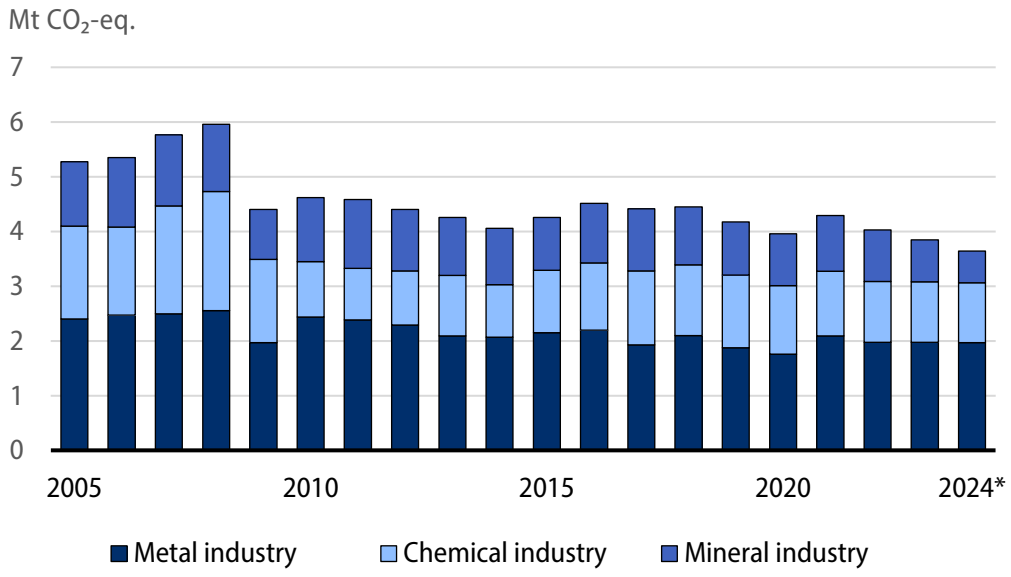


Figure 27. Final energy consumption by sector. Source: Statistics Finland.

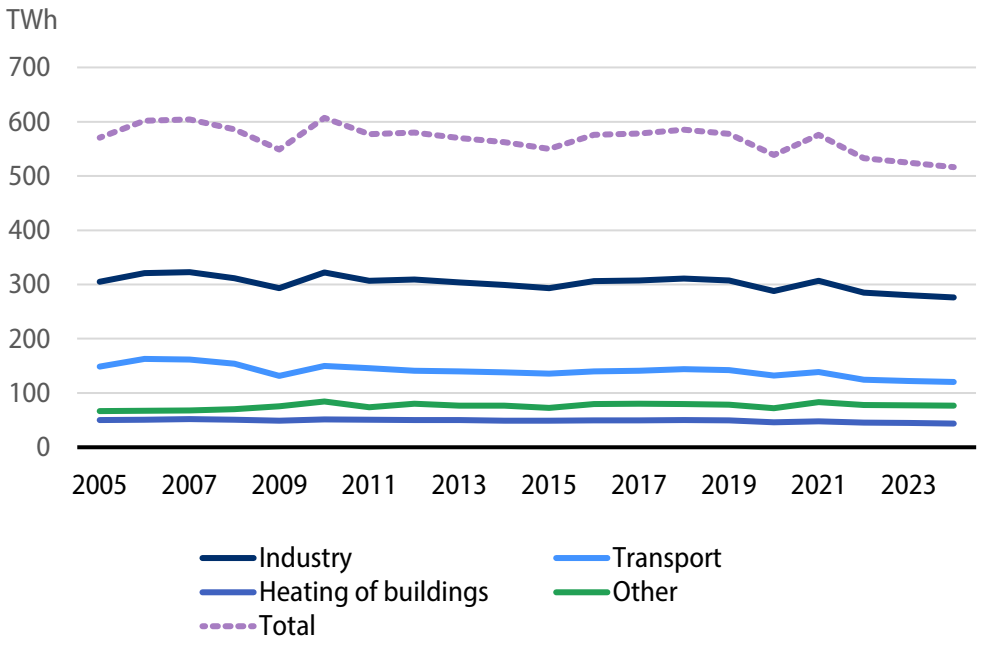
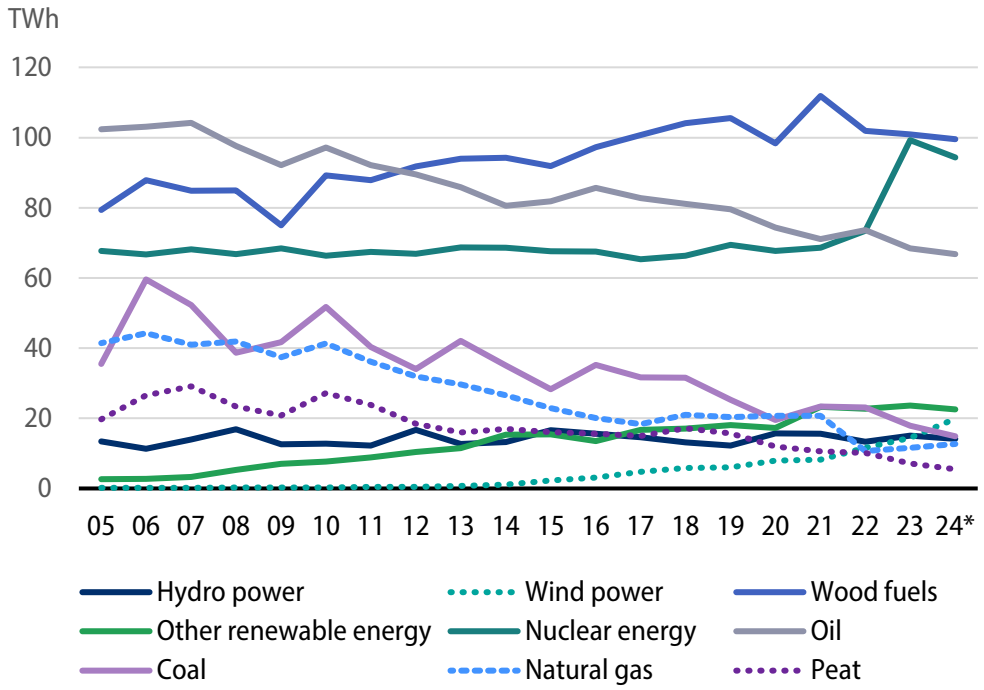


Figure 28. Total energy consumption by energy source in 2005–2024. *The 2024 data is preliminary data. Source: Statistics Finland.



Transport

Figure 29. Energy consumption in road transport by energy source in 2005–2024. *The 2024 data is preliminary data. Source: Statistics Finland.

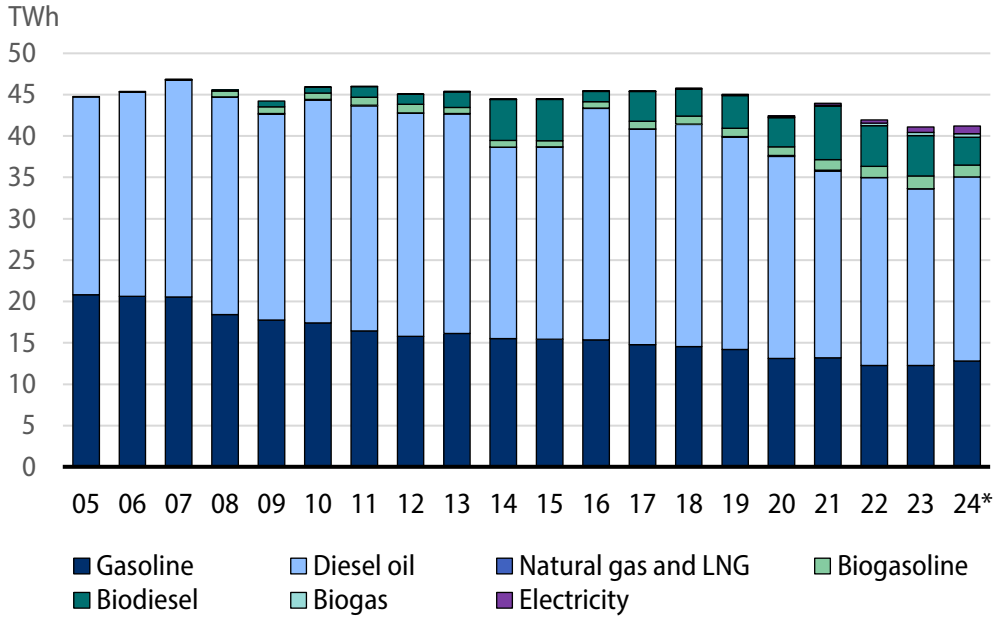


Figure 30. Road transport performance (million km) in 2000–2024. The statistical method for calculating street performance changed in 2016. Source: Statistics Finland.
mill. km

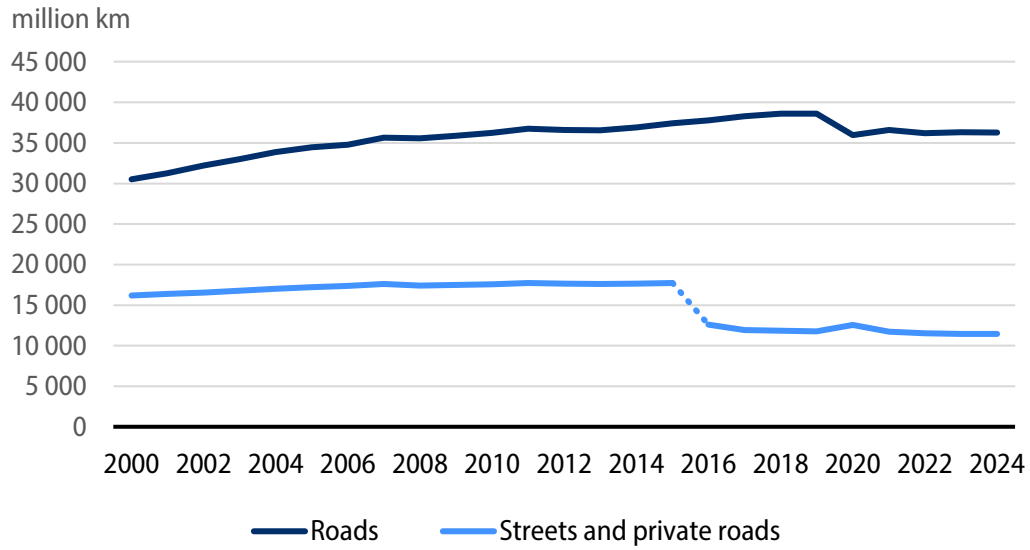


Figure 31. Share of biofuels in transport fuels (%) based on legislation in force. Double counting is taken into account in the commitments for 2008–2020, whereas the commitments for 2021–2030 do not include double counting. From 2022 onwards, the distribution obligation also takes account of gas. Source: Statistics Finland and Ministry of Economic Affairs and Employment.

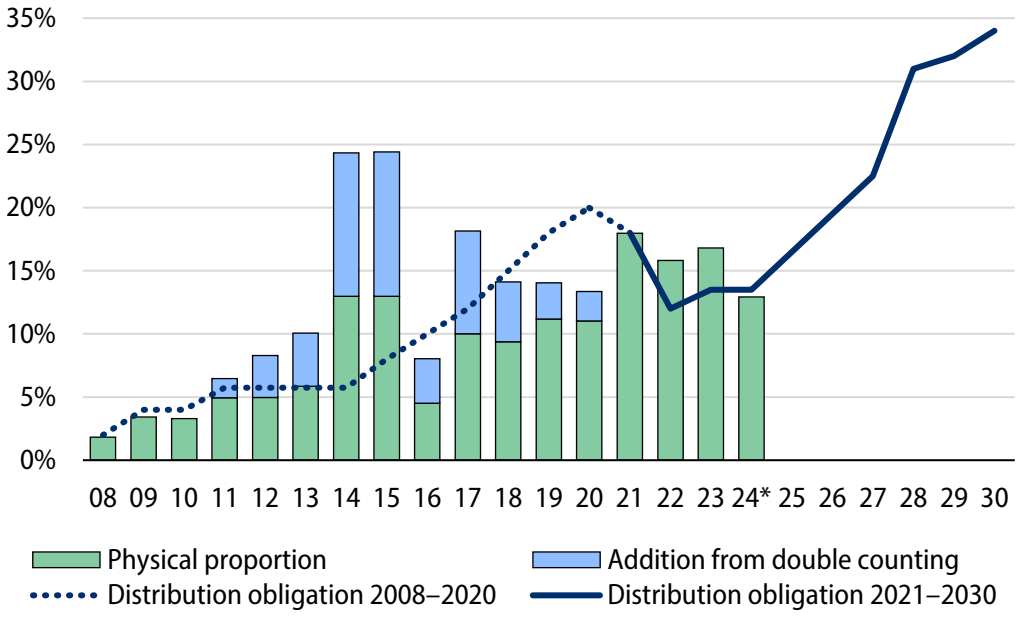


Figure 32. First registrations of passenger cars in 2005–2024 and imported used passenger cars in 2014–2024. Source: Traficom.

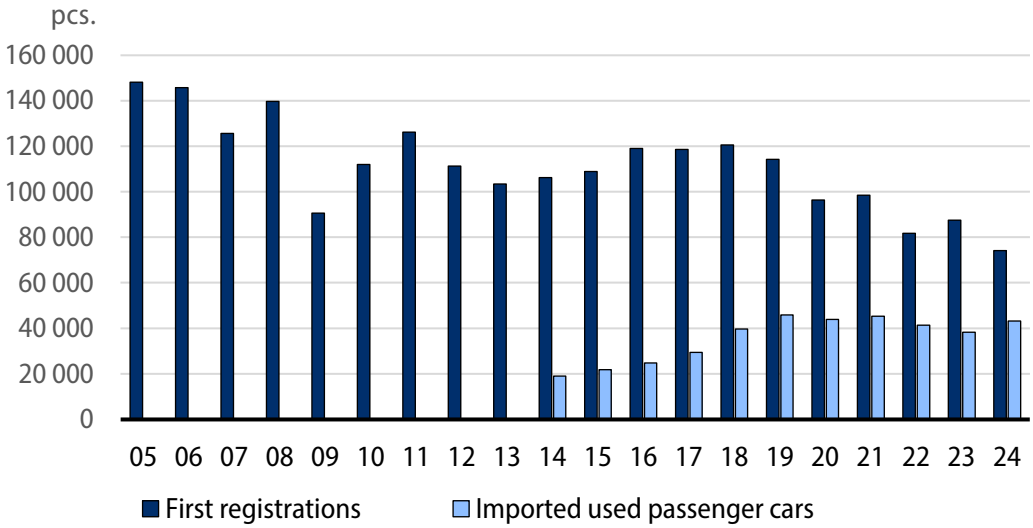


Figure 33. CO_2 emissions (g/km) from passenger cars registered for the first time in 2019–2025, measured using the Worldwide Harmonised Light Vehicles Test Procedure (WLTP). Source: Traficom.

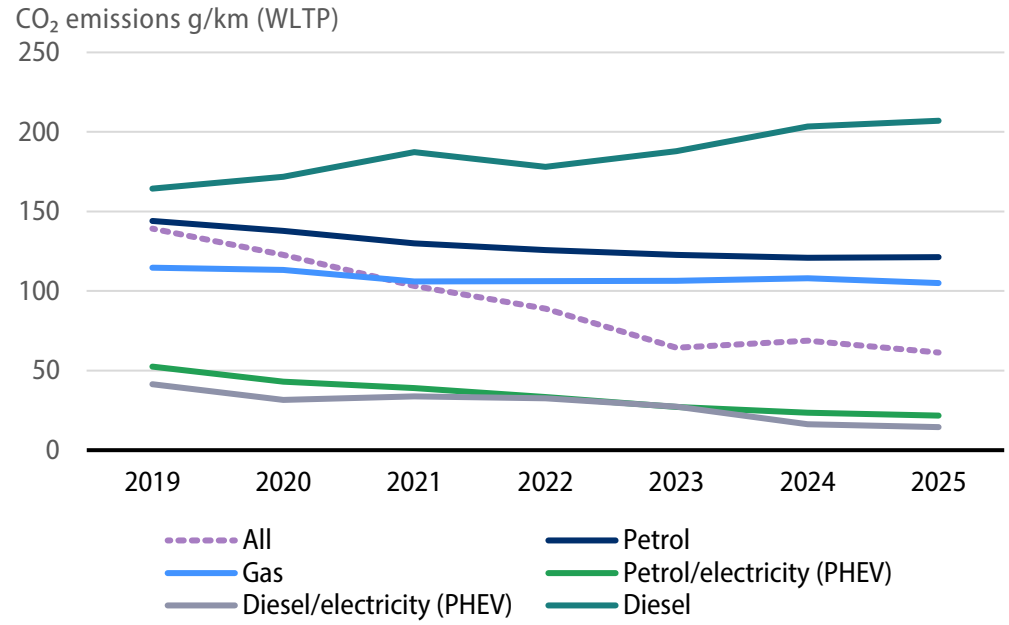


Figure 34. Location and coverage of public charging stations, 12/2024. Source: Traficom.

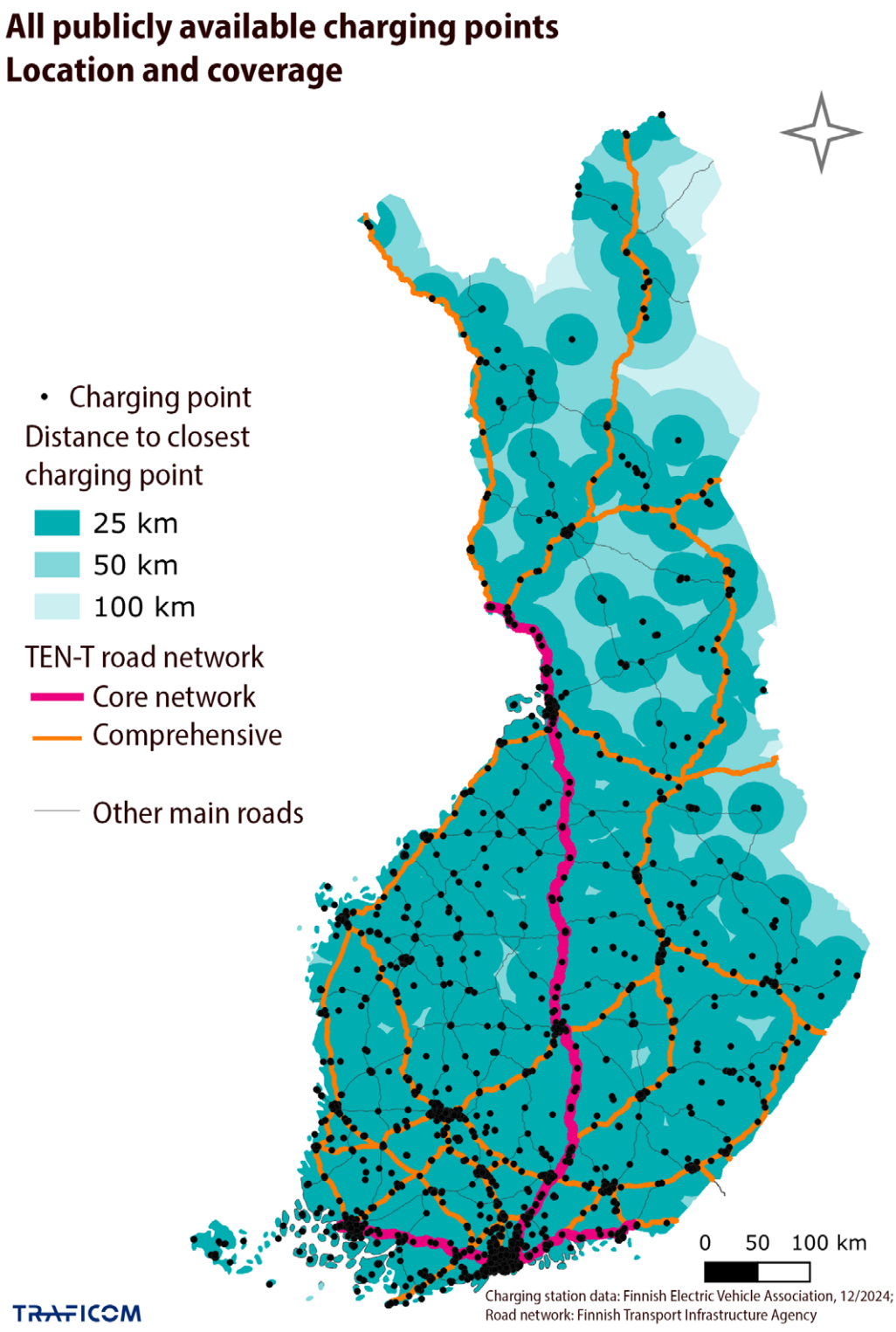


Figure 35. Existing and planned charging stations for heavy-duty vehicles. Source: Traficom.

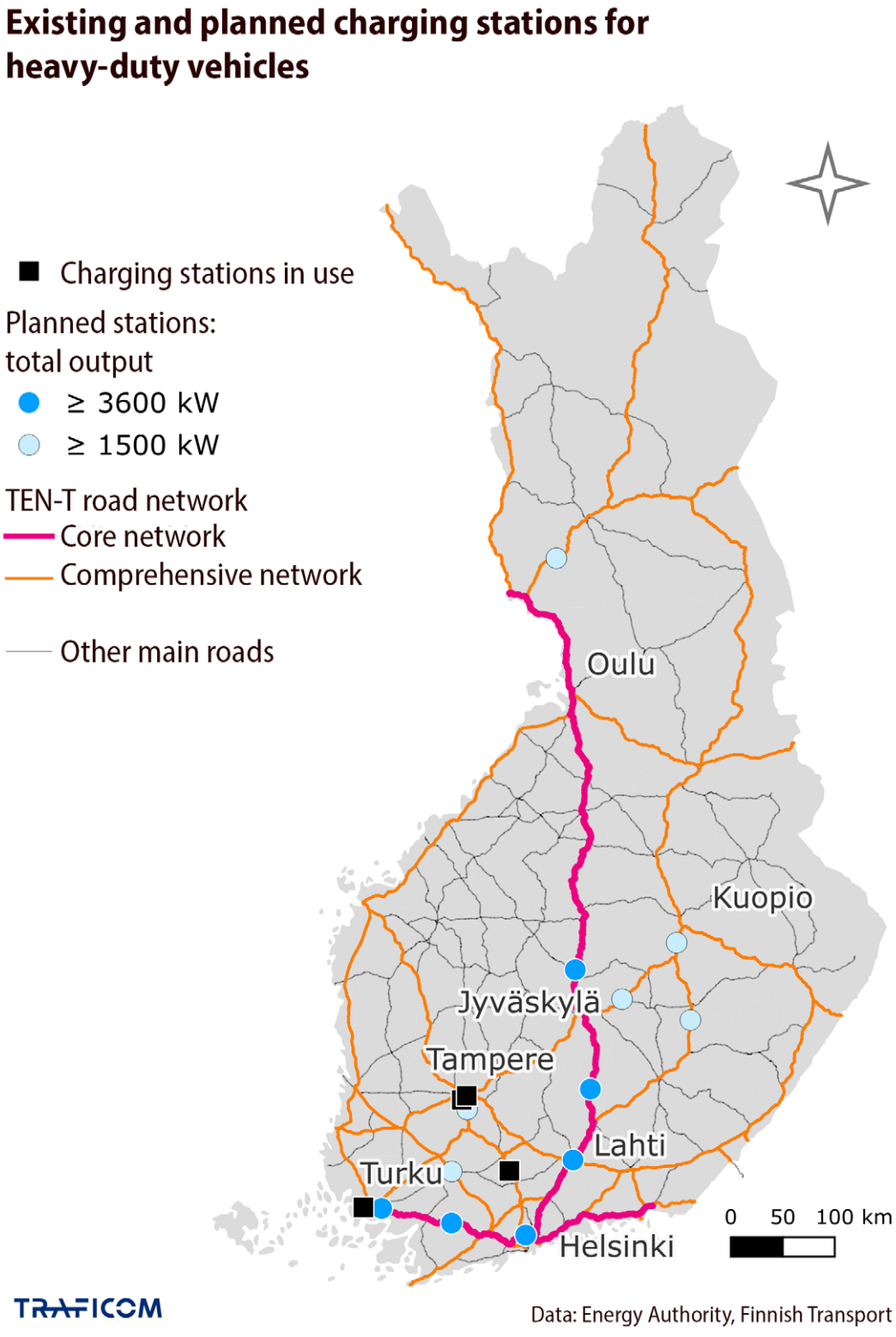


Figure 36. Number of electric, gas and ethanol vehicles in Finland in 2010–2024. Source: Statistics Finland.

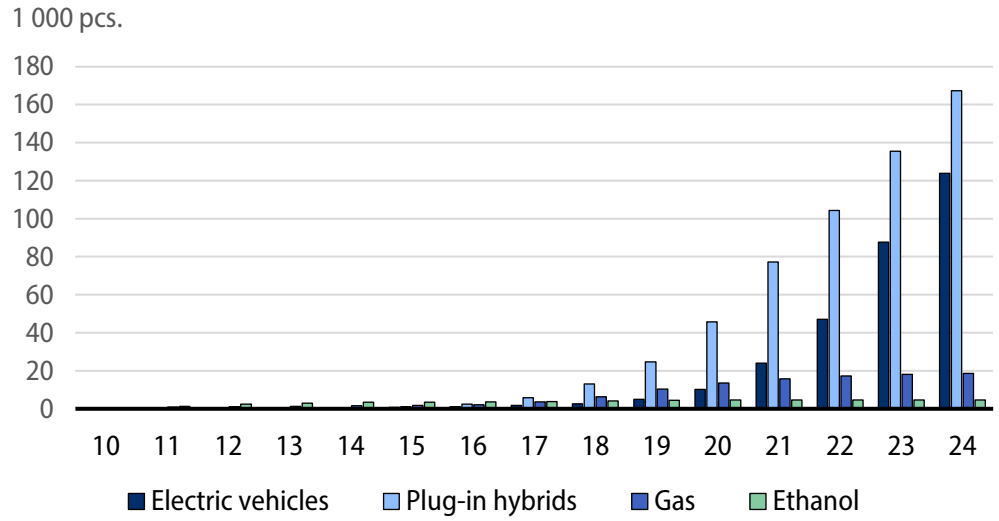


Figure 37. Average age of passenger cars in traffic use in 1990–2024. Source: Traficom, Statistics Finland.

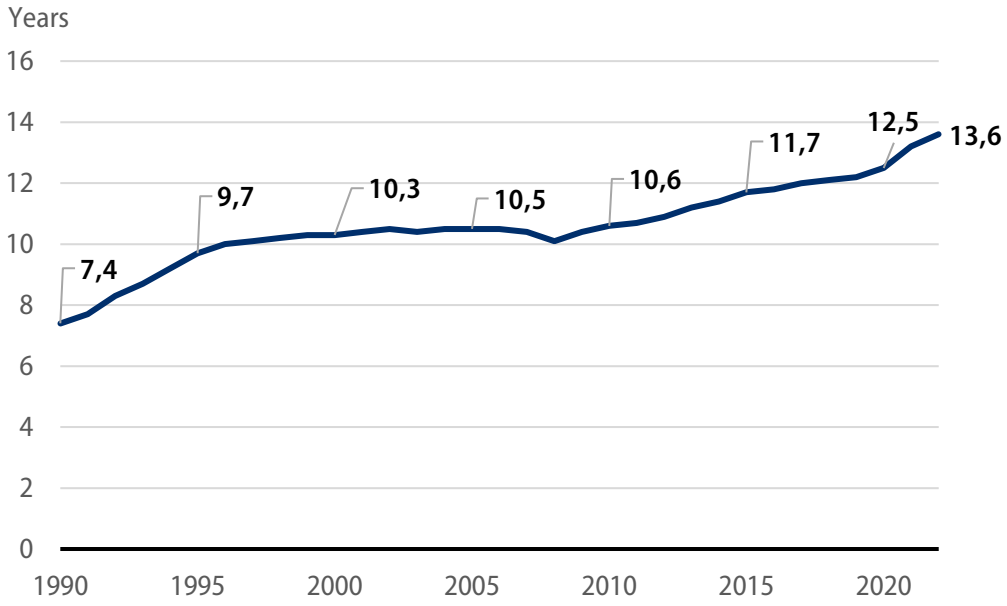
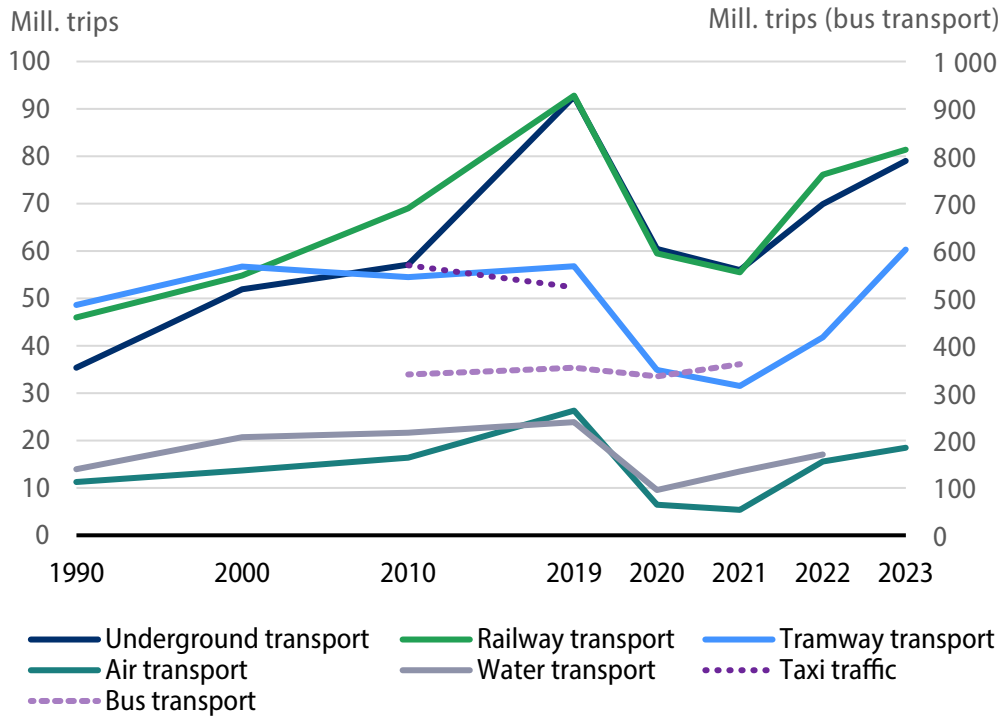


Figure 38. Passengers by mode of transport in 1990–2023. Source: Traficom.



Agriculture

Figure 39. Use of arable land in 2005–2024. Source: Natural Resources Institute Finland.

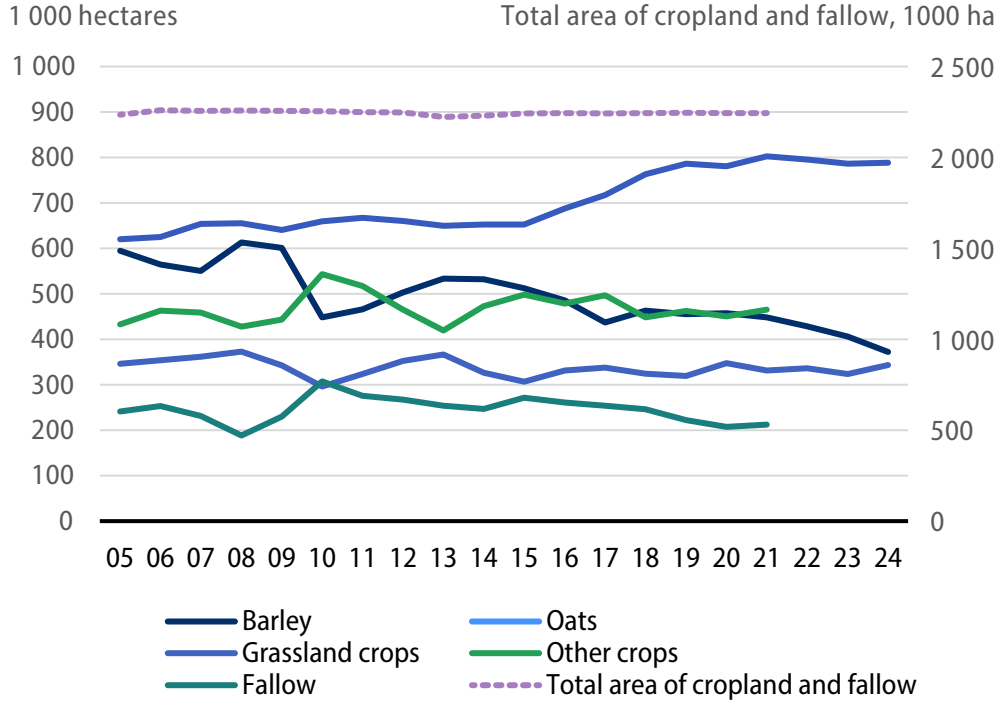
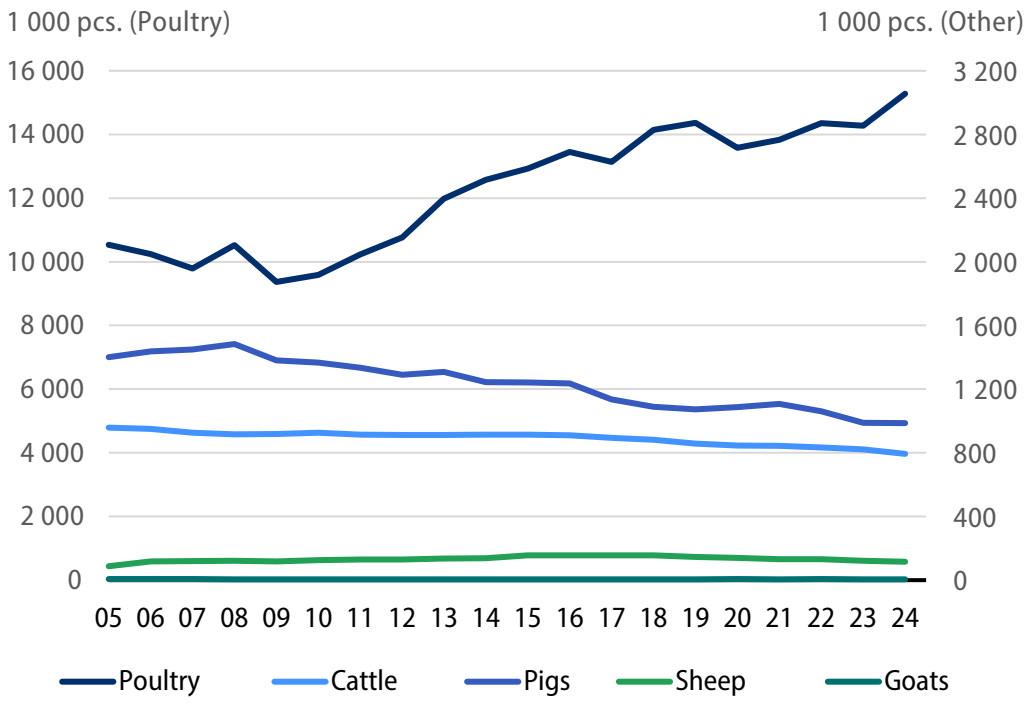


Figure 40. Numbers of animals on farms in 2005–2024. Source: Natural Resources Institute Finland.



Building-specific heating and use of light fuel oil

Figure 41. Emissions from light fuel oil by sector in building-specific heating and total emissions from building-specific heating in 2004–2023. Agriculture includes grain dryers. Source: Statistics Finland.

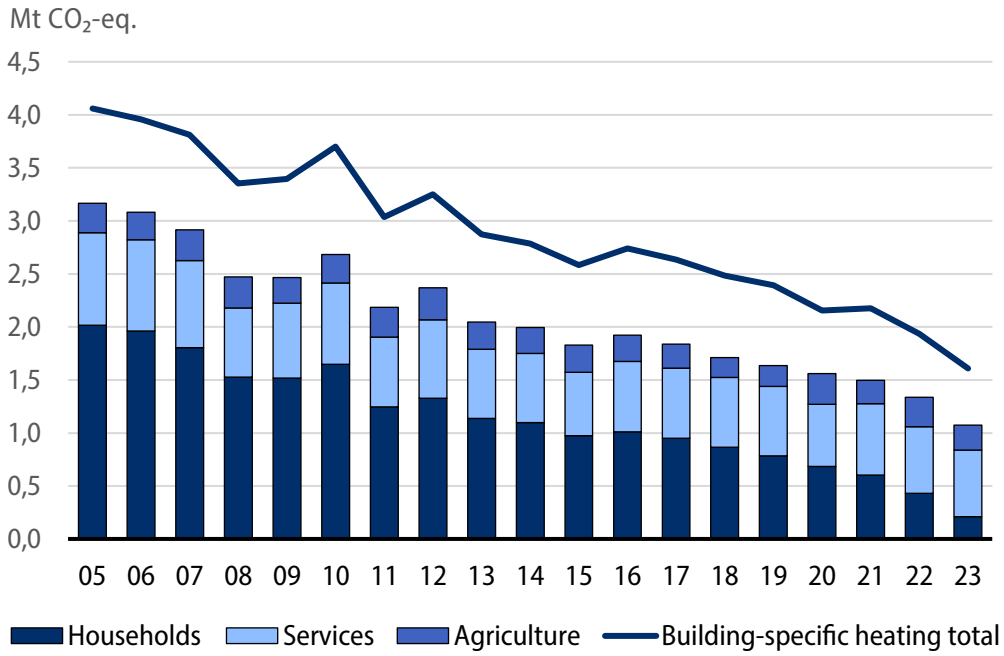
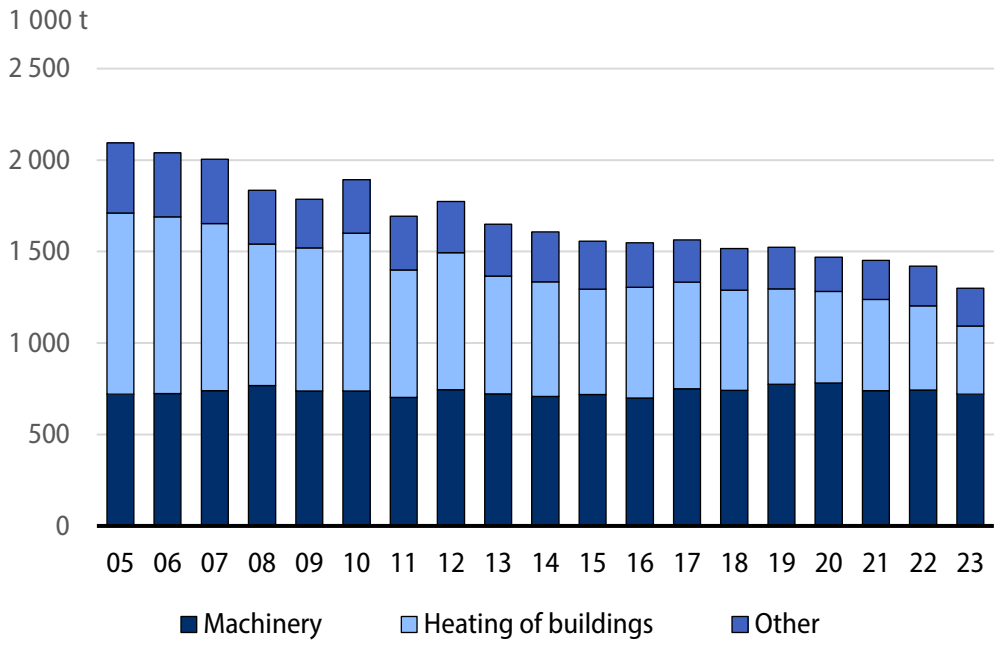
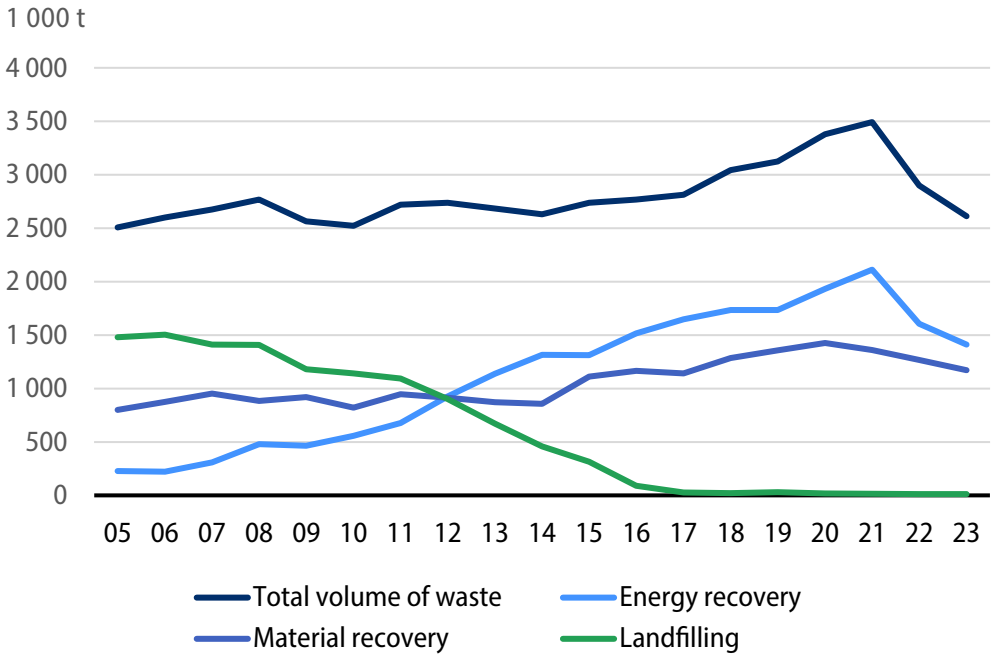


Figure 42. Consumption of light fuel oil in the effort sharing sector, broken down into non-road mobile machinery, building-specific heating and other uses in 2005–2023. Other uses include things such as oil use in industry for purposes other than machinery, and oil use in rail transport, waterborne transport and fishing vessels. Source: Statistics Finland.



Waste management

Figure 43. Amount of municipal waste in Finland by treatment method in 2005–2023. Source: Statistics Finland and Finnish Environment Institute.



Adaptation

Figure 44. Number of residents in significant flood risk areas. This represents the number of residents at risk of a rare flood (statistical recurrence interval 1%, 1/100a, except if significance is caused by a flood type other than flood in open water, e.g. flood caused by ice). Source: Finnish Environment Institute.

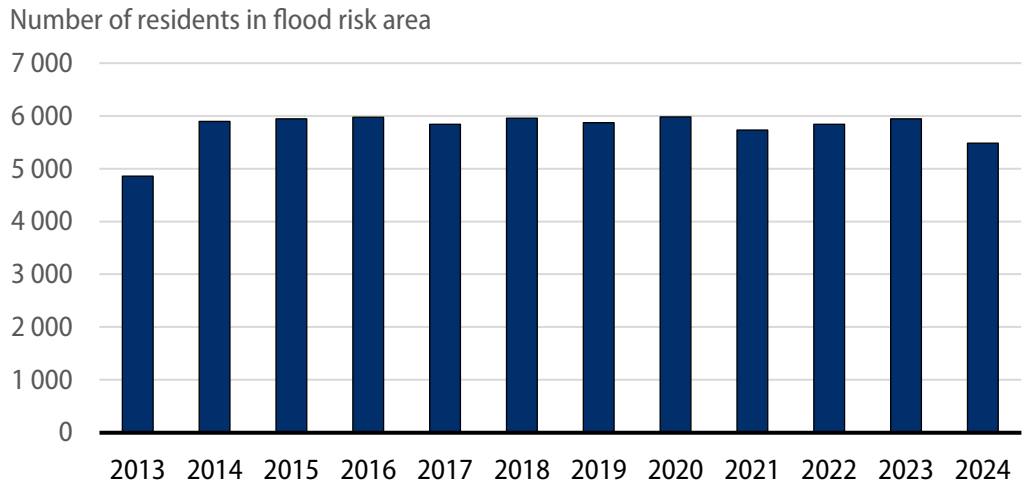
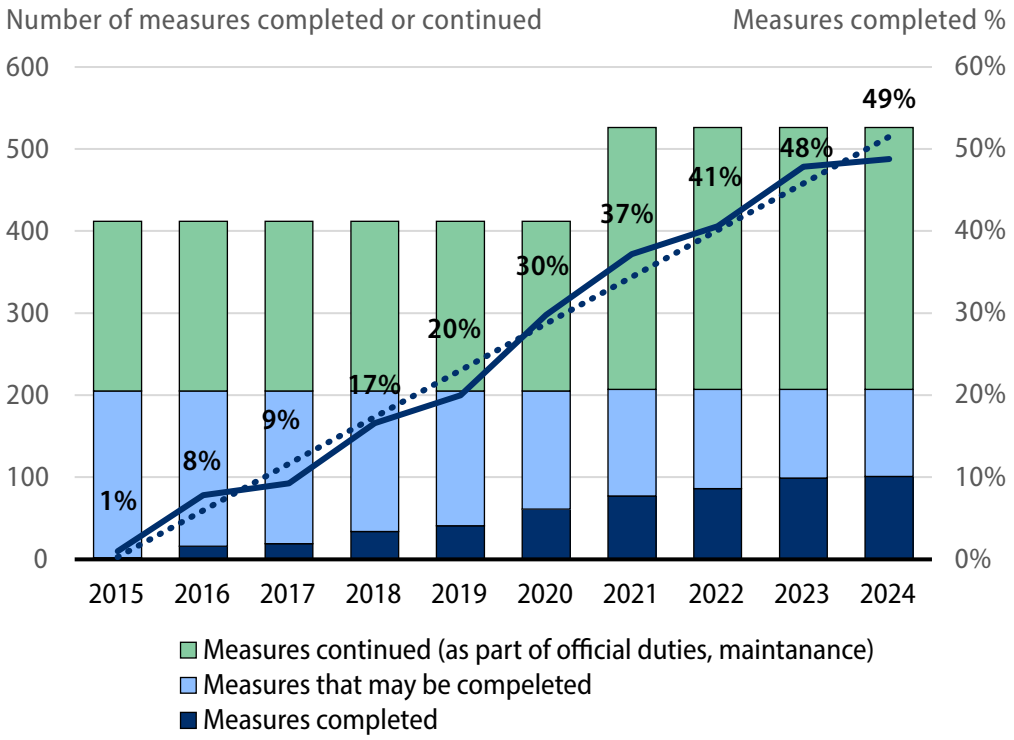
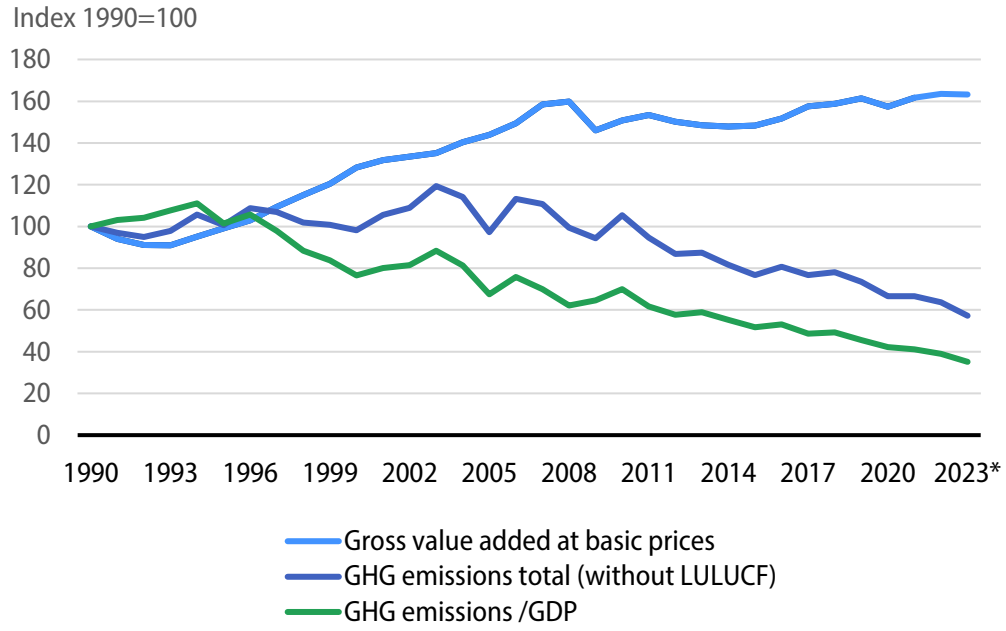


Figure 45. Implementation of flood risk management measures. Share of completed measures of those that have been or may be completed (situation at the start of the year). The figure also shows the numbers of measures that have been completed, are being completed or are currently underway. Source: Finnish Environment Institute.



National economy

Figure 46. Trend in national economy (gross value added at basic prices, at reference year 2015 prices) and in GHG emissions in Finland in 1990–2023. *The 2023 GDP data is preliminary data. Source: Statistics Finland.



GHG emissions internationally

Figure 47. GHG emissions in the EU and EU-27 per capita in 2023. Source: EEA.

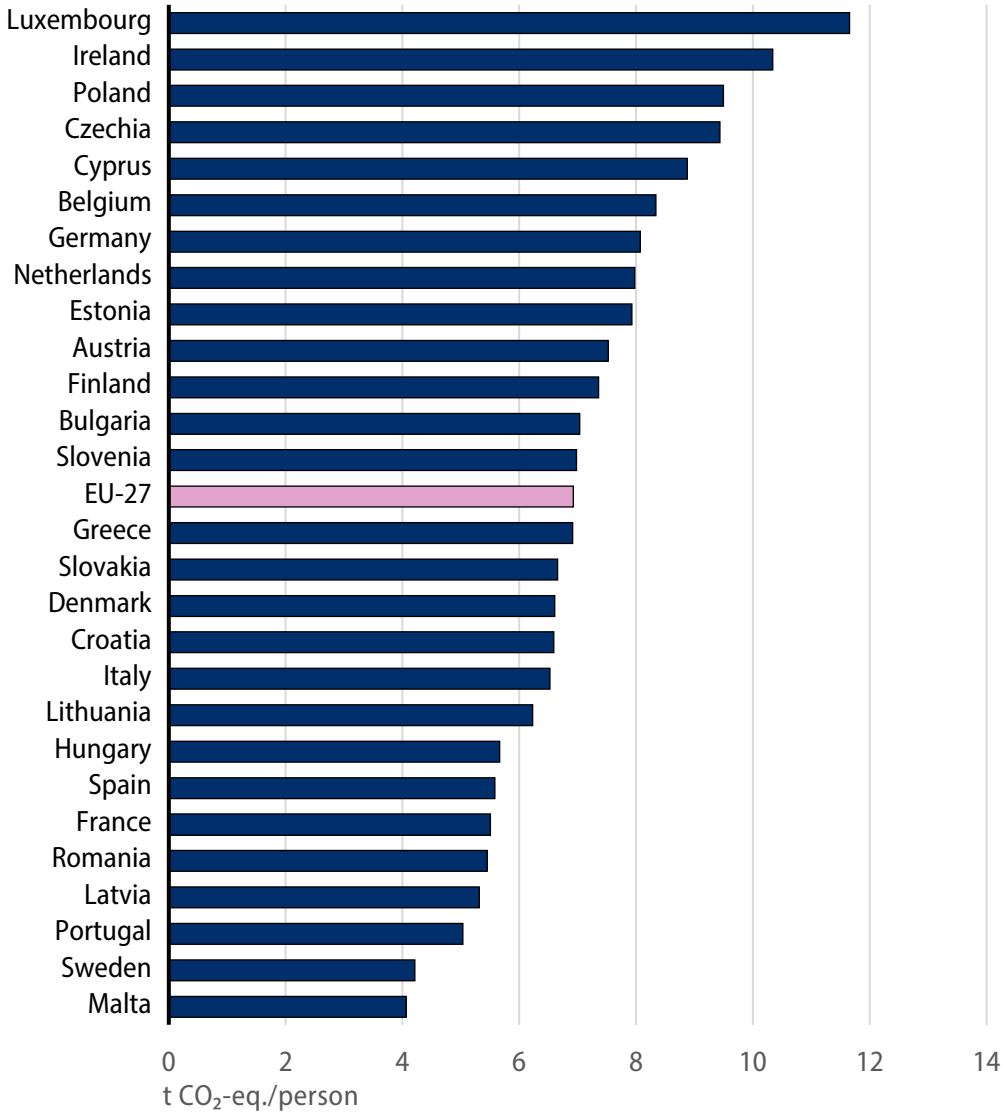
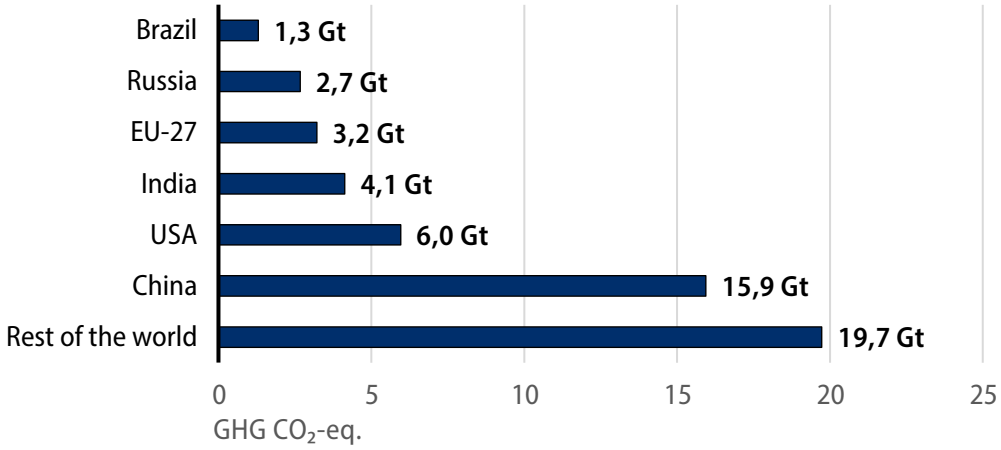


Figure 48. Global GHG emissions in 2022. Source: Joint Research Centre 2024.



Appendix 4. MTCP2 implementation status

Table 12. MTCP2 implementation status. Traffic light colours and plus and minus signs indicate the status of implementation.

Sectors and measures	Implementation status	
Transport		
Roadmap to fossil-free transport, phase 1	+/–	Partially implemented.
Roadmap to fossil-free transport, phase 2	+/–	Partially implemented.
ETS2	+	Implemented (emissions trading to start in 2027).
Increasing the distribution obligation to 34%	+/–	Implemented, but relaxing the distribution obligation will reduce the emission reduction effect.
Agriculture		
Actions of the WAM scenario created in the HIISI project	+/–	Partially implemented.
Increasing paludiculture and additives in feed	+/–	Partially implemented.
Other measures in agriculture	+/–	Partially implemented.
Building-specific heating		
Phasing out of oil heating in residential and service properties	+	Implemented – Allocated until 2023, but not beyond.
Increase of the distribution obligation of bio-LFO	–	Not implemented.
Energy tax +EUR2.7 per MWh	+	Tax change made in 2021.
ETS2	+	Implemented (emissions trading to start in 2027).
Non-road mobile machinery		
Increase of the distribution obligation of bio-LFO	–	Not implemented.
Energy tax +EUR2.7 per MWh	+	Tax change made in 2021.

Sectors and measures	Implementation status	
Promotion of biogas	+	Implemented.
ETS2	+	Implemented (emissions trading to start in 2027).
Other measures	+	Implemented.
Industry and other emissions		
F-gas measures	+/–	Partially implemented.
Green Deal for waste incineration	–	Not implemented
Increase of the distribution obligation of bio-LFO	–	Not implemented.
Energy tax +EUR2.7 per MWh	+	Tax change made in 2021.
Promotion of biogas	–	Implemented.
Roadmaps	+	Roadmaps updated in 2024.
Defence Forces' measures	+/–	Partially implemented.
ETS2	+	Implemented (emissions trading to start in 2027).
Equivalent emissions in emissions trading		
Municipal actions	+/–	Partially implemented.
Actions by consumers	+/–	Partially implemented.
One-off flexibility	+	Available.
LULUCF flexibility	–	Not available.

Appendix 5. Data on the implementation of measures in the Climate Plan for the Land Use Sector from 2023

Table 13. Summary of the degree of implementation of the measures and climate impact assessments (NTS = no target set; IA= impossible to assess; ND = no data source; NA = data not available). Table compiled by Natural Resources Institute Finland.

Measure	Implementation (% of target)	Climate impact assessment (Mt CO_2-eq)
1. Climate actions in state-owned forests	105%	0.245
2a. Preventing the conversion of forests into fields	64–173%	0.71
2b. Preventing the clearing of forests for settlements	NTS	-0.34
2c. Developing the structure of arable land	93%	IA
3. Fixed-term afforestation support for waste land	74%	0.045
4. Afforestation of low-yield fields suitable for afforestation	ND	ND
5. Grassland farming on peatlands with raised water level of -30 cm	NA	NA
6. Cultivation of peatlands with raised water level of -30 cm	NA	NA
7. Cultivation of peatlands with raised water level of -5 – -10 cm	ND	ND
8. Climate wetland on peat fields	NA	NA
9. Perennial grassland on peat fields	NA	NA
10. Wetting low-yield, thick-peat fields and cut-over peatlands to establish climate wetlands	ND	ND
11. Avoiding drainage repairs in the context of thinning not only in mires but also in bogs	8%	0.00034
12. Continuous-cover forestry in mires	43%	0.09

Measure	Implementation (% of target)	Climate impact assessment (Mt CO_2-eq)
13. Promoting ash fertilisation in peatland forests	44%	0.020*
14. Promoting fertilisation of mineral soil forests	76%	0.156*
15. Promoting rapid and efficient forest renewal	NTS	IA
16. Increasing the carbon stock of decaying wood in commercial forests by leaving retention trees in place	65%	0.047
Total	–	**0.97334**

* Climate impact excludes the impact of fertilisation of state-owned forests, which is included in Climate actions in state-owned forests.

The monitoring data of the Climate Plan for the Land Use Sector is complemented by the monitoring data of the Common Agricultural Policy (CAP), as the plan's peatland activities are funded through the CAP. The application for the grassland on peat fields measure was not yet submitted in the first financial year of the current CAP period (until 15 October 2023), but the actual area was just under 2,000 ha for the financial year 2024. Similarly, for the CAP wetland investments, the actual area of the first financial year was 0 ha, but for the financial year 2024, the area of wetland investments was 310 hectares and the area of the wetland management measure was about 1,350 hectares. Investment in wetlands has been slower than expected.

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