



REPUBLIC OF ESTONIA
MINISTRY OF CLIMATE

Report pursuant to Article 39 of Regulation (EU) 2018/1999

Estonia

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PREFACE

As a member of the European Union (EU), Estonia has an obligation for reporting on national policies and measures and national projections of anthropogenic greenhouse gas emissions under Article 39 of Regulation (EU) 2018/1999 of the European Parliament (Governance Regulation) and of the Council and Articles 36, 37 and 38 of Commission Implementing Regulation (EU) 2020/1208.

According to the Commission Implementing Regulation (EU) 2020/1208 Member States have an obligation to prepare a report in every two years, including:

- a) National systems for policies and measures and projections
- b) Updates relevant to their low-carbon development strategies;
- c) Planned additional policies and measures
- d) Links between the different policies and measures and the contribution of those policies and measures contribute to different projection scenarios.

Estonia's 2025 report on policies and measures and greenhouse gas (GHG) projections up to 2055 is comprised of this report and Reportnet 3 datasets.

The report was compiled by the Estonian Environmental Research Centre.

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Table of Contents

- 1. GENERAL INFORMATION 5**
 - 1.1. INFORMATION ON CHANGES TO NATIONAL SYSTEM FOR REPORTING ON POLICIES AND MEASURES AND PROJECTIONS 5
- 2. INFORMATION ON POLICIES AND MEASURES 5**
 - 2.1. GENERAL CLIMATE POLICY CONTEXT 5
 - 2.2. CROSS-SECTORAL POLICIES 6
 - 2.3. SECTORAL POLICIES AND MEASURES 9
 - 2.3.2. TRANSPORT 14
 - 2.3.3. INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU) 15
 - 2.3.4. AGRICULTURE 16
 - 2.3.5. LAND USE, LAND-USE CHANGE AND FORESTRY (LULUCF) 19
 - 2.3.6. WASTE MANAGEMENT 21
- 3. GREENHOUSE GAS EMISSION PROJECTIONS 2023–2055 22**
 - 3.1. KEY ASSUMPTIONS AND PARAMETERS USED 22
 - 3.2. SECTORAL WOM AND WEM PROJECTIONS 23
 - 3.2.1. *Energy (excluding transport)* 23
 - 3.2.2. *Transport* 25
 - 3.2.3. *IPPU* 27
 - 3.2.4. *Agriculture* 30
 - 3.2.5. *Land-use, land-use change and forestry (LULUCF)* 35
 - 3.2.6. *Waste* 39
 - 3.3. TOTAL PROJECTED GHG EMISSIONS OF ESTONIA 42
 - 3.4. SENSITIVITY ANALYSIS 44
 - 3.4.1. *Transport* 44
 - 3.4.2. *IPPU* 45
 - 3.4.3. *Land-use, land-use change and forestry (LULUCF)* 46
 - 3.4.4. *Waste* 48
 - 3.5. CHANGES WITH RESPECT TO THE 2024 SUBMISSION 48
 - 3.5.1. *Energy* 48
 - 3.5.2. *Transport* 49
 - 3.5.3. *IPPU* 50
 - 3.5.4. *Agriculture* 52

3.5.5.	<i>Land-use, land-use change and forestry (LULUCF)</i>	53
3.5.6.	<i>Waste</i>	54

1. GENERAL INFORMATION

1.1. Information on changes to national system for reporting on policies and measures and projections

Information on the national system is included in Reportnet 3 dataset on National systems for policies and measures and projections.

2. INFORMATION ON POLICIES AND MEASURES

2.1. General climate policy context

On 12 May 2021, the Parliament adopted Estonia's development strategy **Estonia 2035**¹. The strategy sets out five long-term strategic goals that are value-based goals, which are the basis for making the country's strategic choices and to the implementation of which all Estonian strategic development documents contribute. They are also taken into account in the state budget strategy and in the preparation of the government's action programme. In order to reach the goals, it is necessary to take into account Estonia's development needs, global trends, the policy framework of the European Union, and the global objectives of sustainable development.

According to the strategy, by 2050, Estonia will be a competitive, climate-neutral country with a knowledge-based society and economy and a high quality and species-rich living environment, willing and able to reduce the adverse effects of climate change and make the best use of its positive aspects. Coordinated development of the cultural, social, environmental and economic fields is a prerequisite for achieving the goals of sustainable development. In Estonia, knowledge-based decisions are made, with effective and innovative approaches being preferred when choosing solutions.

The **Estonia 2035 Action Plan** is updated annually, if necessary, by the government based on domestic events affecting the development of Estonia and changes in the foreign environment. The Estonia 2035 action plan is also the Estonian reform plan submitted within the framework of the European Semester for the coordination of economic policies. The current action plan was approved by the government on April 25, 2024².

Estonia's long-term **General Principles of Climate Policy until 2050 (GPCP 2050)**³ is a vision document setting the long term GHG emissions reduction target and policy guidelines for adapting to the impact of climate change or ensuring the preparedness and resilience to react to the impact of climate change. In February 2023, the Parliament adopted an amendment to the long-term target in accordance with the 2050 climate neutrality goal set in Estonia's development strategy Estonia 2035. Estonia's long-term goal according to the GPCP 2050 is to

¹ Estonia 2035 (2021). [www] https://valitsus.ee/sites/default/files/documents/2021-11/Eesti%202035_PUHTAND%20%C3%9CLDOSA_210512_ENG_0.pdf (09.12.2024)

² Estonia 2035 Action Plan (updated 25.04.2024). [www] https://valitsus.ee/sites/default/files/documents/2024-04/Eesti%202035%20tegevuskava_25.04.2024.pdf (09.12.2024)

³ General Principles of Climate Policy until 2050 (2017). [www] <https://kliimaministeerium.ee/sites/default/files/documents/2023-03/310022023003%20%281%29.pdf> (09.12.2023)

balance GHG emissions and sequestration by 2050 at the latest, i.e. reduce net greenhouse gas emissions to zero by then.

In September 2023, the process of development of the Estonian **Climate Resilient Economy Act**⁴ was launched, which from 2025 onwards will provide a framework for all Estonian law-making and help turn a smaller environmental footprint and climate-friendly economy into Estonia's competitive advantage in the future. In the bill of the Climate Resilient Economy Act, sector-wide and sector-specific goals are set to ensure a smooth trajectory to reach climate neutrality by 2050. Sector-specific goals are set for the energy, industry, buildings, transport, agriculture, waste and land use sectors. Setting specific sector-based targets is necessary to ensure greater legal clarity and thus investment security.

Targets set in the bill of the Climate Resilient Economy Act are based on public consultation and the climate targets of the European Union, which are set for the years 2030 and 2050 in accordance with the Paris Agreement, and the pace of emission reduction that can be achieved with existing technologies. The European Union requirements impose national emission reduction obligations in scope of the Effort Sharing Regulation⁵ as well as for the LULUCF regulation⁶.

The **Estonia's 2030 National Energy and Climate Plan (NECP 2030)**⁷ is a communication that has been drawn up to meet the requirement laid down in Article 3 (1) of Regulation (EU) No 2018/1999 on the Governance of the Energy Union and Climate Action. NECP 2030 includes both measures from national development documents and measures under discussion. NECP 2030 has been drawn up jointly by the Ministry of Economic Affairs and Communications, the Ministry of Climate and the Ministry of Regional Affairs and Agriculture based on the development documents, studies and other relevant analysis.

2.2. Cross-sectoral policies

The main policies of the **EU 2030 Climate and Energy Framework** are the *EU Emissions Trading System (EU ETS)*⁸, the *LULUCF Regulation*⁶ and the *Effort Sharing Regulation (ESR)*⁵.

The **European Union Emissions Trading System (EU ETS)**⁹ is one of the key policy instruments implemented in the EU to achieve its climate objectives. The legislative framework of the EU ETS for its new trading period (phase 4 in 2021–2030) was revised in early 2018 to

⁴ Ministry of Climate. Climate Resilient Economy Act. [www] <https://kliimaministeerium.ee/eesti-kliimaseadus> (20.12.2024)

⁵ Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement, as amended. [www] <http://data.europa.eu/eli/reg/2018/842/2023-05-16>. (09.12.2024)

⁶ Regulation (EU) 2018/841 on the inclusion of greenhouse gas emissions and removals from land use, land-use change and forestry in the 2030 climate and energy framework, as amended- [www] <https://eur-lex.europa.eu/eli/reg/2018/841/oj/eng>(09.12.2024)

⁷ Ministry of Climate. National Energy and Climate Plan 2030. [www] <https://kliimaministeerium.ee/energeetika-maavarad/energiapoliitika/energia-ja-kliimakava> (20.12.2024)

⁸ This refers to the ETS1, i.e. the Emission Trading System for stationary sources (Chapter III of the ETS Directive) and for aviation and maritime transport (chapter II of the ETS Directive). Note that the 'Emissions trading system for buildings, road transport and additional sectors' (ETS2), added in 2023 as Chapter IVa of the ETS Directive, forms an instrument under the Effort Sharing Regulation (ESR).

⁹ EU Emissions Trading System [www] https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/scope-eu-ets_en (09.12.2024)

enable it to achieve the EU's 2030 emission reduction targets and as part of the EU's contribution to the Paris Agreement. According to the revision, the pace for annual reductions in allowances increased to 2.2% as of 2021. The share of Estonia's EU ETS emissions from all sectors is high – in 2022 about 60% (without LULUCF), according to Estonia's 2024 GHG inventory submission to the UNFCCC.⁵²

Emissions from sectors not covered by the EU ETS, i.e. under the so-called **Effort Sharing Regulation**⁵ (transport, agriculture, waste management and industrial processes, and small-scale power generation in installations with a nominal capacity of less than 20 MW) will have to be reduced by 40% by 2030 compared to 2005 levels in the European Union. The Effort Sharing Regulation establishes binding emission reduction targets for Member States of the European Union for the period 2021–2030 in sectors outside the scope of the EU ETS. Under the regulation, Estonia aims to reduce greenhouse gas emissions in the abovementioned sectors by 24% by 2030 compared to 2005 emission levels. It is up to each Member State to decide how these targets will be achieved, which national policies and measures are needed to fulfil the targets.

The **Land Use, Land Use Change and Forestry (LULUCF) Regulation**⁶ has an overall EU-level target of 310 Mkt CO₂ eq. net removals in the LULUCF sector by 2030. In addition, the LULUCF sectors are subject to the principle that Member States must ensure compliance with the no-debit rule in 2021–2025, i.e. the emissions of the sector must be offset by equivalent removals. However, for the period 2026–2029, Member States will be set a GHG removal budget (in 2025) and a relative target for LULUCF removals by 2030. Estonia will need to increase its GHG removals by 0.434 Mt CO₂ eq. by 2030 compared to the baseline level (average for 2016–2018).

The **Estonian Recovery and Resilience Plan**¹⁰ is one of the annexes to the national strategy **Estonia 2035**, focusing on the objectives, reforms and investments financed from the Recovery and Resilience Facility. The aim is to contribute to the decarbonisation of Estonia's energy sector, to reduce the dependency on oil shale, incentivize uptake of renewable energy and improve the energy efficiency of buildings.

The European Commission endorsed **Estonia's territorial just transitions plan** on 4 October 2022 (amended in September 2024).¹¹ The general objective of the plan is to enable the transition to a climate-neutral economy in Ida-Virumaa in a way that ensures the well-being of the local community, while supporting businesses in identifying and implementing new business opportunities linked to the transition.

Excise duty

Excise duties under the **Energy tax measure** (in [Table 2.1](#)) are one of the fiscal measures in Estonia with an impact on GHG emissions.

¹⁰ Estonia's recovery and resilience plan (2023). [www] <https://pilv.rtk.ee/s/kwzABsf9cJY4mmb> (09.12.2024)

¹¹ Estonia's territorial just transitions plan (2024). [www] https://idavirufond.ee/sites/default/files/documents/2024-10/EE_TJTP_muudetud_EK-kinnitatud-2024-09-26.pdf (09.12.2024)

Table 2.1 Excise tax on fuels and electricity (as of November 2024)

Fuel/energy type	Unit	EUR/unit
Unleaded petrol	1,000 l	563
Leaded petrol	1,000 l	563
Aviation spirit	1,000 l	563
Kerosene	1,000 l	330.1
Diesel oil	1,000 l	399
Diesel oil for specific purposes	1,000 l	21 ¹
Light heating oil	t	399
Heavy fuel oil	t	456
Heavy fuel oil ²	t	58
Shale-derived fuel oil	t	447
Shale-derived fuel oil ³	t	57
LPG (used as heating fuel)	t	65.01
LPG (used as motor fuel)	t	193
Natural gas (used as heating fuel)	1,000 m ³	47.81
Natural gas (to a gas-intensive undertaking with a permit for exemption from excise duty)	1,000 m ³	11.30
Motor natural gas (which is used as motor fuel, including in stationary engines)	1,000 m ³	41.83
Motor natural gas in liquefied form (which is used as used as motor fuel, including in stationary engines)	1,000 kg	58.34
Solid fuels (coal, brown coal, coke, oil shale; heat production)	GJ (GCV)	0.93
Electricity	MWh	1.45
Electricity (to an electro-intensive undertaking with a permit for exemption from excise duty)	MWh	0.5

Pollution charges

Pollution charges are a second fiscal measure in Estonia with an impact on GHG emissions. The government's tax policy is based on objectives aimed at reducing environmental impact by increasing the rates of charges on pollution and resource use.

The **Environmental Charges Act (2006)**¹² provides the grounds for determining the natural resource charges, the rates of the pollution charge, the procedure for calculation and payment thereof, and the grounds and specific purposes for using state budget revenue obtained from environmental use. Environmental charges are established and imposed based on the need for environmental protection, the economic and social situation of the state and, in the events specified in this Act, also based on the value created by natural resources subject to the charge as well as the purpose and manner of use of the environment. A mineral resource extraction charge that exceeds the minimum rates provided for in this Act is established based on the state's

¹² The Environmental Charges Act (2006). [www] [Environmental Charges Act–Riigi Teataja](#) (09.12.2024)

goal of earning revenue. In the case of an energy mineral resource, the added value generated by the energy mineral resource is relied upon in addition to the goal of earning revenue. In Estonia a pollution charge for releasing CO₂ into the ambient air was introduced in the year 2000. Currently, the Environmental Charges Act obliges the owners of combustion equipment to pay pollution charges for several pollutants emitted into the air. The pollution charge in the case of emissions into ambient air must be paid by all enterprises that are required to have an air pollution permit. The air pollution permit is obligatory for all enterprises which own and operate combustion equipment (utilising solid, liquid or gas fuel) with a rated capacity equal to or higher than 1 MWth in one location. Thermal power producers pay a pollution charge for the CO₂ emissions into the ambient air based on the quantity of CO₂ emitted into the environment upon the amount of CO₂ emitted. The CO₂ charge is 25 EUR/t for the companies/installations not included in the European Union emission trading scheme. Installations that emit sulphur oxide, carbon monoxide, particles, except heavy metals and compounds of heavy metals, nitrogen oxides, volatile organic compounds, heavy metals and compounds of heavy metals into the ambient air also pay a pollution charge. CH₄ and fluorinated gases (HFC – hydrofluorocarbons, PFC and SF₆) are not subject to pollution charges.

As an exception, the Environmental Charges Act provides an option of substituting the pollution charge (incl. the CO₂ charge) with environmental investment by enterprises. The obligation to pay the pollution charge is substituted by the obligation to finance environmental protection measures for pollutants or types of waste whose quantity is reduced by at least 15% by the planned environmental protection measures.

In 2024 the Environmental Charges Act was amended by including also a deforestation charge in the Act, please see additional information on this under chapter 2.3.5. *Land use, land-use change and forestry (LULUCF)*.

2.3. Sectoral policies and measures

This chapter includes sectoral information on Policies and Measures (PaMs) in ‘With Existing Measures’ (WEM) scenario. Additional information on PaMs is included in Reportnet 3 dataset on Integrated national policies and measures. Estonia has not presented for the 2025 submission ‘With Additional Measures’ (WAM) scenario as during the projections’ preparation period the discussions on the Climate Resilient Economy Act bill, where additional measures are proposed, was undergoing and therefore the WAM scenario was not prepared as not to prejudge the Climate Resilient Economy Act adoption process.

2.3.1. Energy

The following chapter includes policies and measures for electricity supply, heat supply, energy consumption – commercial/institutional and residential sectors and energy consumption – and manufacturing industries. In the Energy sector GHG emissions are mainly reduced through policies and measures that support achieving higher energy efficiency as well as shifting to zero or low emission alternative fuel use.

The Government of Estonia approved the **Estonian Energy Development Plan until 2030** (ENMAK 2030) in 2017.¹³ The current ENMAK 2030 aims to consume renewable energy in a volume that would be at least 50% of the final energy consumption by 2030 (~16 TWh).

Since the European Union is increasing its renewable energy targets, Estonia has taken a major step towards more ambitious targets in 2022 with an amendment to the **Energy Sector Organisation Act (2016)**¹⁴, according to which by 2030 renewable energy must be at least 100% of gross final consumption of electricity. Thus, the production of electricity from oil shale will gradually decrease at the same time as ensuring that there is a certain degree of controllable generation capacity. Also, by 2030, renewable energy must account for at least 65% (~20.4 TWh) of national gross final energy consumption.

The objectives of the sectors set out in the Energy Sector Organisation Act by 2030 are as follows:

- **electricity:** at least 100% renewable energy in gross final consumption of electricity;
- **transport:** renewable energy used in road and rail transport accounts for at least 14% of total energy consumed in transport;
- **heat:** at least 63% renewable energy in gross final consumption of heat.

The Government of Estonia is currently updating the ENMAK 2030. The renewed **Energy Development Plan until 2035**¹⁵ aims to update the trends, goals and activities of the energy economy included in the ENMAK 2030. It will also include the development vision, goals, bottlenecks and policy instruments of the Estonian energy economy in moving towards climate-neutral energy production and consumption and ensuring energy security. The planned approval of the renewed Energy Development Plan until 2035 is set for the year 2025.

Several measures affecting the Energy sector (incl. building sector), with estimated highest GHG reduction impact (in kt CO₂ eq.), are presented in Reportnet 3 policies and measures dataset.

Electricity supply

The **Electricity Market Act (2005)**¹⁶ governs the generation, storage, transmission, sale, export, import and transit of electricity and the economic and technical management of the power system. This Act prescribes the principles of the operation of the electricity market, based on the need to ensure an effective supply of electricity, which is provided at a reasonable price, meets environmental requirements and the needs of consumers, and the utilization of energy sources in a balanced manner, in an environmentally clean way and with a long-term perspective. The Act states that electricity undertakings shall always facilitate activities performed by consumers for the purpose of conserving electricity. Pursuant to §59 of the

¹³ Estonian Energy Development Plan until 2030 (2017). [www] <https://kliimaministeerium.ee/sites/default/files/documents/2023-07/Energiamajanduse%20arengukava%20aastani%202030.pdf> (09.12.2024)

¹⁴ Energy Sector Organisation Act (2016). [www] <https://www.riigiteataja.ee/en/eli/517112024001/consolide> (09.12.2024)

¹⁵ Ministry of Climate. Energiamajanduse arengukava (ENMAK). [www] https://kliimaministeerium.ee/energiamajanduse_arengukava (09.12.2024)

¹⁶ Electricity Market Act (2005). [www] <https://www.riigiteataja.ee/en/eli/ee/528082014005/consolide/current> (09.12.2024)

Electricity Market Act, support is paid to the electricity producer in order to meet the 2030 goal of electricity production from renewable energy sources (100%) (see [Table 2.2](#)).

Table 2.2. Support for renewable and efficient combined heat and power (CHP) based electricity production

Level of subsidy	Conditions for receiving the subsidy
	Subsidies are paid for electricity that is produced:
0.0537 €/kWh	Electricity generated from a renewable energy source except biomass if the net capacity of the production machinery does not exceed 125 MW
0.0537 €/kWh	From biomass in CHP mode. From 1 July 2010, producers who have started generating electricity from biomass can only get the subsidy for electricity generated in efficient CHP mode
0.032 €/kWh	In efficient CHP mode from waste as defined in the Waste Act, peat or oil shale retort gas
0.032 €/kWh	In efficient CHP mode using generating equipment with a capacity of not more than 10 MW

Electricity supply WEM scenario measures that affect the reduction of GHGs the most are connected to the Electricity Market Act. From its support more renewable and efficient CHP-based electricity production have been introduced. In addition, the act helps to increase the share of solar and wind power in electricity production (see Reportnet 3 policies and measures dataset).

In addition to the WEM scenario measures, there are measures, which directly or indirectly help implement the WEM scenario measures. To support achieving those goals, measures like investment in a compensation measure in Northeast Estonia, acquisition of air surveillance radars, preliminary development of offshore wind farm, green procurements and reinforcement of the electricity grid will help more renewable energy to be introduced to the Estonian electricity system.

Renewable energy

Estonia’s renewable energy trajectory derives from national renewable energy targets that are more ambitious than the targets set in the Directives ((EU) 2018/2001 and (EU) 2018/1999) agreed at European Union level, with an overall EU target of 42.5% + a possible 2.5% and a domestic target of 65%, including Estonia’s renewable energy trajectory in line with milestones (at least 18% of the overall target in 2022, at least 43% of the overall target by 2025 and at least 65% of the overall target by 2027).

To support achieving this goal, measures like encouraging biomethane production, deployment of hydrogen technologies, accelerating the introduction of renewable electricity and a green fond are being implemented (see Reportnet 3 policies and measures dataset).

Heat Supply

The **District Heating Act (2003)**¹⁷ governs activities related to the production, distribution and sale of heat by way of district heating networks and connection to district heating networks.

In the past few years, a continuous transition to renewable sources has been happening in the heating sector. More and more boiler houses and cogeneration plants have switched to renewable fuels, and according to 2023 data, the share of renewable energy and waste heat in district heating was about 75%¹⁸, of which 93% have received the label of efficient district heating.

Heat supply WEM scenario measures, which have the largest effect on GHG reduction, are connected to renovation of depreciated and inefficient heat pipelines, renovation of district heating boilers and fuel change and fuel oil boiler replacement with heating system renovation in households (see Reportnet 3 policies and measures dataset).

Energy use in buildings

The housing and energy sector are very closely related, as the energy demand of buildings is an important part of Estonia's energy balance. In 2022, the energy consumption of buildings in Estonia made up 53%¹⁹ of the total energy balance and therefore improvement of energy efficiency in the residential and tertiary sectors has an important role from the emissions reduction aspect.

In Estonia, policies implemented to improve energy efficiency increasingly lead to the adoption of energy-efficient buildings and the renovation of buildings to be more energy-efficient to reduce energy dependence and greenhouse gas emissions of the housing sector. Renewable energy solutions must be applied in making buildings more energy efficient, where possible and be based on the aspect of cost effectiveness.

Here, the impact of EU Directive (EU) 2018/844 of the European Parliament and of the Council amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency (EPBD)²⁰ should be highlighted as these set minimum energy efficiency requirements for buildings, which set total energy consumption limits for the building. In Estonia, the implementation of the EPBD is the responsibility of the Ministry of Climate. The provisions of the EPBD have been transposed into the Building Code. The **Building Code (2015)**²¹ promotes sustainable development and ensures the safety, purposeful functionality and usability of the built environment, which is supported by the **Minimum building energy efficiency requirements regulation (2019)**²².

¹⁷ District Heating Act (2003). [www] <https://www.riigiteataja.ee/en/eli/ee/520062017016/consolide/current> (09.12.2024)

¹⁸ Energatalgud. Eesti üleminek süsinikuneutraalsele soojus- ning jahutusmajandusele aastaks 2050. [www] <https://energiatalgud.ee/node/8931> (09.12.2024)

¹⁹ Riigikantselei. Hoone indikatiivse energiatõhususe klassi reaalajas määramine ning energiatõhususearvu järelevalve automatiseerimine. [www] <https://riigikantselei.ee/hoone-indikatiivse-energiatõhususe-klassi-reaalajas-maaramine-ning-energiatõhususearvu-jarelevalve> (13.12.2024)

²⁰ Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings. [www] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202401275&pk_keyword=Energy&pk_content=Directive (09.12.2024)

²¹ Building Code (2015). [www] <https://www.riigiteataja.ee/en/eli/ee/510102024002/consolide/current> (09.12.2024)

²² Minimum building energy efficiency requirements regulation (2019). [www] <https://www.riigiteataja.ee/akt/105072023309?leiaKehtiv> (09.12.2024)

In 2020, the government approved a **long-term reconstruction strategy (REKS)**²³, the main goal of which is to completely renovate all buildings built before 2000 in Estonia by 2050. The strategy presents a long-term vision for the reconstruction of buildings and describes the activities and their scope necessary to achieve the goal. Based on this, Estonia is planning and developing necessary support measures for the building sector.

Energy use in buildings WEM scenario measures, which have the largest effect on GHG reduction, are connected to renovation of public (municipal, governmental) buildings, private households and apartment buildings (see Reportnet 3 policies and measures dataset).

Energy efficiency

The **Energy Sector Organisation Act (2017)**¹⁴ provides measures for achieving the national target of energy efficiency, the principles for promoting renewable energy and the requirements for improving energy efficiency and the parties on whom obligations are imposed in the public as well as in the private sector.

The **Product Conformity Act (2010)**²⁴ sets out the competence of authorities participating in market surveillance and stipulates that the Technical Surveillance Authority must exercise state surveillance over compliance of household appliances, heating appliances and devices with energy efficiency, energy performance labels and ecological design requirements.

Energy efficiency WEM scenario measures (additionally to the ones concentrating on building reconstruction presented in previous sections), which have the largest effect on GHG reduction, are connected to decreasing energy consumption in industries, exchanging old lighting for LED lighting in street lighting and public spaces (see Reportnet 3 policies and measures dataset).

In addition, there are measures and programmes, which directly or indirectly help implement the WEM scenario measures. These measures for example are support for energy- and resource audits in industries, energy storage pilot program, adoption of resource-efficient green technologies, energy taxes to support the continuity of local production and the change of business models, so that the products of Estonian production companies meet the goals of environmental and climate neutrality and are competitive in export markets.

Methodologies and assumptions used to estimate the GHG emission reductions or removals

In the Energy sector, methodologies for estimating GHG emission reduction of policies and measures focus on calculating the impact through energy savings and/or the fuel exchange from fossil fuels to renewables. This kind of information is retrieved from institutions (e.g. ministries) responsible for the measures. Also, studies carried out in Estonia are used as input source for impact estimations. Assumptions about used fuel types and carbon content are taken from the national inventory datasets as they are particularly critical for accurate emissions estimates, as the national inventory defines the base year. Ultimately, rigorous methodologies

²³ Ministry of Climate (2020). Long-term reconstruction strategy. [www] <https://kliimaministeerium.ee/sites/default/files/documents/2023-06/Hoonete%20rekonstrueerimise%20pikaajaline%20strateegia.pdf> (09.12.2024)

²⁴ Product Conformity Act (2010). [www] <https://www.riigiteataja.ee/en/eli/ee/515042021005/consolide/current> (09.12.2024)

and conservative assumptions help to ensure that reported GHG reductions in the Energy sector are both realistic and credible, providing a sound basis for measuring and verifying climate benefits.

2.3.2. Transport

The main strategic development document for the transport sector in Estonia is the Transport and Mobility Development Plan 2021–2035²⁵, which focus is to reduce the environmental footprint of the transport means and system to contribute to the achievement of climate goals by 2050. In order to manage people’s behavioral changes in the future, emphasis is placed on the ‘polluter pays’ principle and, among other things, to taxation of fuels according to their emission factors and energy content. Also, according to the development plan, it is necessary to introduce low-carbon fuels in all modes of transport.

For this development plan, the Ministry of Economic Affairs and Communications (now the Ministry of Climate) also commissioned a report from the International Transport Forum (ITF) “The Future of Passenger Mobility and Goods Transport in Estonia” (2020)²⁶, the goal of which was to assess Estonia’s transport sector and give recommendations for future improvements from an external observer’s perspective.

In the Transport sector GHG emissions are mainly reduced through policies and measures that can be divided widely in four by supporting: 1) reduction of forced movements and transport needs; 2) the availability of sustainable modes of movement; 3) increase in the share of energy efficient vehicles and; 4) increase in the proportion of fuels with lower emissions.

The **Liquid Fuel Act (2003)**²⁷ provides the principles and procedure for handling liquid fuel, the liability for violations of this Act and the arrangements for exercising state supervision, with a view to ensuring the payment of taxes and guaranteeing the quality of the more widely used motor fuels. According to §2¹ of the Act the total energy content of the petrol, diesel and biofuel released for consumption, as well as of the electricity supplied for use in road transport, by the seller of fuel or by a person holding an authorization for the import of fuel, must include, as a total energy content of biofuels – or of biomethane, hydrogen or electricity supplied for final consumption – at the value, as a weighted average for the calendar year, of at least 7.5% by the end of that year.

As road transport emits the biggest share of GHGs in the Transport sector, a lot of measures focus on decreasing the GHG impact from road transport. The Transport sector WEM scenario measures, which have the largest effect on GHG reduction, are connected to increasing the share of biofuels (including electricity) in private and public transport, increasing the number

²⁵ Ministry of Climate (2021). Transport and mobility development plan 2021–2035. [www] https://kliimaministeerium.ee/sites/default/files/documents/2023-09/Transpordi%20ja%20liikuvuse%20arengukava%202021-2035_EN%20%281%29.pdf (09.12.2024)

²⁶ International Transport Forum (2020). The Future of Passenger Mobility and Goods Transport in Estonia. [www] https://www.oecd.org/en/publications/the-future-of-passenger-mobility-and-goods-transport-in-estonia_9db7333e-en.html (09.12.2024)

²⁷ Liquid Fuel Act (2003). [www] <https://www.riigiteataja.ee/en/eli/ee/531032014004/consolide/current> (09.12.2024)

of departures of the public transport, modal shift but also decreasing travel time to decrease the usage of personal cars.

Although a lot of measures focus on decreasing the GHG impact from road transport, there are also measures being implemented that are directed towards railroad and domestic navigation. The focus in railroad is electrification and in domestic navigation replacing ferries, which run on diesel, for alternative fuel (electricity/hydrogen) ferries.

A number of measures affecting the Transport sector with estimated highest GHG reduction impact (in kt CO₂ eq.) are presented in Reportnet 3 dataset.

Methodologies and assumptions used to estimate the GHG emission reductions or removals

In the Transport sector, methodologies for estimating GHG emission reduction of policies and measures primarily focus on assessing changes in fuel consumption, vehicle efficiency and modal shifts due to new initiatives. Key assumptions include travel distances, fuel economy, and vehicle stock, which help estimate baseline emissions that would occur without interventions. Accurate reductions are calculated by incorporating factors such as improvements in vehicle technology, the adoption of alternative fuels, and shifts to lower-carbon modes of transport like public transit or cycling. Emission factors and the baseline fuel consumption of the sector are taken from the national inventory datasets, as they are particularly critical for accurate emissions estimates, as the national inventory defines the base year. By using standardized methodologies and conservative assumptions, transport sector estimates ensure a credible understanding of GHG reductions, providing clear insights into the effectiveness of sustainable transport projects.

2.3.3. Industrial processes and product use (IPPU)

Emissions from the IPPU sector are regulated by the duty for manufacturing industries to implement the best available technologies (BAT) (stipulated in the Industrial Emissions Act (IEA) (2013)²⁸ and Industrial Emissions Directive 2010/75/EU²⁹. The purpose of the IEA is to achieve a high level of protection of the environment taken as a whole by minimizing emissions into the air, water and soil and the generation of waste in order to prevent adverse environmental impacts. In addition, the IEA determines industrial activities of high environmental hazard, provides the requirements for operation therein and liability for failure to comply with the requirements, and the organization of state supervision. A production plant must comply with the BAT. The requirements of the IEA include emission limit values, monitoring and emission reduction measures through the implementation of BATs if an environmental permit is issued. This does not result in an additional reduction of emissions because all production plants have to comply with BATs as they operate.

²⁸ Industrial Emissions Act (2013). [www] <https://www.riigiteataja.ee/en/eli/ee/525022019001/consolide/current> (09.12.2024)

²⁹ Consolidated text: Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial and livestock rearing emissions (integrated pollution prevention and control). [www] <https://eur-lex.europa.eu/legal-content/IT/ALL/?uri=CELEX:02010L0075-20240804> (09.12.2024)

In the IPPU sector, the main measures having an effect on GHG emissions are the Bans and duties from the Regulation (EU) 2024/573³⁰ on fluorinated greenhouse gases (F-gases) and Directive 2006/40/EC³¹ related to emissions from mobile air conditioners (MACs).

Regulation (EU) 2024/573 establishes a timeline for the gradual reduction of F-gases by 2050, which will be implemented through the implementation of a system of import quotas and bans/restrictions for new equipment that is placed on the EU market. The objectives are to significantly reduce fluorinated greenhouse gas emissions and replace fluorinated greenhouse gases with refrigerants with low GWP, limiting the total amount of the most important F-gases sold in the EU from 2015 onwards and phasing new F-gas down by 2050. To achieve this, a phase-down scheme of F-gases brought onto the EU market is stipulated, bans on placing on the market and servicing of certain equipment, (certification) duties for operators and servicing personnel, duty of collecting the gases from decommissioned equipment.

The objective of MACs Directive 2006/40/EC is to reduce F-gas emissions from passenger cars and vans by prohibiting the use of F-gases with a GWP of more than 150 times greater than carbon dioxide (CO₂) in new types of cars and vans introduced from 2011, and in all new cars and vans introduced to the market from 2017.

Methodologies and assumptions used to estimate the GHG emission reductions or removals

Impacts of different policies and measures in the IPPU sector were not estimated due to missing base parameters. The collective impact of the existing measures can be seen through the sector's projections as 2024 inventory submission data was used as the basis for calculations.

2.3.4. Agriculture

Development of the Agriculture sector and the implementation of various targeted measures are mostly governed by the **Common Agricultural Policy (CAP) Strategic Plan 2023–2027** (approved 11.11.2022)³² and **Agriculture and Fisheries Strategy 2030 (AFS2030)**³³. In addition, there are some measures from the **Estonian rural development plan 2014–2020 (ERDP 2014–2020)**³⁴ that are still applying as funding for the implementation of the measures was/is in place until 2023 and/or 2024.

The CAP Strategic Plan 2023–2027 includes four specific objectives, that also contain climate-related actions:

1. Contribute to climate change mitigation and adaptation, including by reducing GHG emissions and enhancing carbon sequestration, as well as promoting

³⁰ Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014. [www] <https://eur-lex.europa.eu/eli/reg/2024/573/oj> (09.12.2024)

³¹ Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 relating to emissions from air conditioning systems in motor vehicles and amending Council Directive 70/156/EEC. [www] <https://eur-lex.europa.eu/eli/dir/2006/40/oj> (09.12.2024)

³² Estonia's Common Agricultural Policy (CAP) Strategic Plan 2023–2027. [www] https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans/estonia_en#documents (09.12.2024)

³³ Ministry of Regional Affairs and Agriculture (2021). Agriculture and Fisheries Strategy 2030. [www] <https://www.agri.ee/en/ministry-news-and-contact/ministry-regional-affairs-and-agriculture/agriculture-and-fisheries> (09.12.2024)

³⁴ Ministry of Regional Affairs and Agriculture. Estonian rural development plan 2014–2020. [www] <https://www.agri.ee/en/estonian-rural-development-plan-erdp-2014-2020> (09.12.2024)

sustainable energy. This specific objective includes the following identified needs:

- to prefer environmentally sustainable production, investments, solutions based on circular bioeconomy;
- to increase carbon sequestration in soils and protect soil organic carbon stocks.

2. Foster sustainable development and efficient management of natural resources such as water, soil and air. This specific objective includes the following identified needs:

- continued support for land improvement investments;
- contribution to the use of agricultural practices that conserve surface and groundwater;
- neutralization of acidic soils;
- encouraging the development and introduction of environmentally friendly technologies;
- development of environmental consulting;
- implementation of the requirements and measures resulting from the air pollutant emission reduction programme;
- maintenance of soil fertility.

3. Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes.

4. Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare. This specific objective includes the following identified needs:

- increasing organic production in organic agriculture by reducing the processing of organic products as conventional products;
- diversity of agricultural and garden (horticultural) crops, availability of varieties suitable for local conditions;
- increasing livestock keepers' knowledge of livestock health and well-being in general.

A number of the CAP Strategic Plan 2023–2027 measures, with estimated highest GHG reduction impact (in kt CO₂ eq.) are presented in Reportnet 3 policies and measures dataset.

The **Estonia's Recovery and Resilience Plan**¹⁰ supports increasing production and uptake of sustainable biogas and biomethane. Biomethane production from animal manure decreases the methane emissions from manure management in the Agriculture sector. Although, it is more customary each year to add larger amounts of biowaste-based substrates into the biogas reactor in addition to animal manure – this increases N₂O emissions from Agricultural Soils category as the digestate is afterwards used on the agricultural land as a fertilizer.

Regarding impact on the environment, the **Organic Farming Act (2007)**³⁵ is important among the legislation regulating the Agricultural sector, as it provides the requirements for operating in the area of organic farming to the extent not regulated by the regulations of the EU, as well as for the grounds and extent of supervision exercised over persons operating in the area of organic farming, and for the liability for violation of the requirements established by such legislation. In addition, several secondary legislative acts have been issued on the basis of this act to regulate aspects of organic farming.

Actions to reduce nitrogen losses from agriculture, for example, based on the requirements of the Directive 91/676/EEC (*Nitrates Directive*)³⁶, have led to reduced nitrogen emissions to the aquatic environment with indirect positive effects for the mitigation of climate gas emissions. The legislation which is relevant for the implementation of the *Nitrates Directive* is the *Water Act*, which was enacted in 1994 and has been revised since, especially in connection with the accession into the European Union. An updated *Code of Good Agricultural Practices* and a Government decree on water protection requirements for fertilizer, manure and silage (revised several times) were introduced. The **Water Act (2019)**³⁷ is one of the principal legal acts that the prime measures in the Estonian Water Management Plan measure programme 2022–2027 are grounded upon.

The Agriculture, Food and Rural Life Programme 2024–2027³⁸ includes activities contributing to GHG emission reduction. The programme includes actions that contribute to the development and competitiveness of Estonian agriculture and food industry, food safety and security, balanced development of rural and coastal areas and good rural life in general. It also contributes to the welfare of plants and animals, the maintenance of good soil conditions and the preservation of a clean environment and biodiversity.

Methodologies and assumptions used to estimate the GHG emission reductions or removals

Impacts of certain WEM scenario measures have been estimated using alternative parameters from the Agriculture Projection Model (APM)³⁹. For the WEM scenario the APM, developed by the Agricultural Research Centre, provides two alternative scenarios with alternative parameters in case one of the two measures is not applied starting from 2024: **1) Eco-scheme for organic farming** and; **2) Animal Welfare Support**. This enables us to compare emissions to the WEM scenario emissions in case the specific measure would not be implemented. The scenario of not implementing the Eco-scheme for organic farming subsidy has an impact on the use of mineral fertilizers, since it is possible to use mineral fertilizers when replacing organic land with conventional cultivation. According to this scenario, the use of mineral Nitrogen fertilizers would increase by 13% by the year 2055 compared to 2024 because of changes in the production area of crops.

³⁵ Organic Farming Act (2007). [www] <https://www.riigiteataja.ee/en/eli/ee/529122021001/consolide/current> (09.12.2024)

³⁶ Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC). [www] <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01991L0676-20081211> (09.12.2024)

³⁷ Water Act (2019). [www] <https://www.riigiteataja.ee/en/eli/ee/527122019007/consolide/current> (09.12.2024)

³⁸ Ministry of Regional Affairs and Agriculture (2024). Programm "Põllumajandus, toit ja maaelu 2024–2027". [www] <https://www.agri.ee/sites/default/files/documents/2024-03/programm-2024-2027-maaelu.pdf> (09.12.2024)

³⁹ Centre of Estonian Rural Research and Knowledge. Agriculture Projection Model. [www] https://metk.agri.ee/pollumajandustootmise_prognoosid#prognoos-2024 (09.12.2024)

In the scenario of not implementing the Animal Welfare Support subsidy, direct subsidies (direct subsidy for raising dairy cows, direct subsidy for raising ewes and female goats, direct subsidy for raising suckling cows) will not be paid from 2024. Therefore, this scenario has an impact on the number of dairy cows, suckler cows, total cattle and total sheep and goats population. In 2055 the number of dairy cows, according to this scenario, would be 576 heads less, the number of lactating cows would be 3,807 heads more, and the number of sheep and goats would be 19,447 heads more compared to the WEM scenario.

According to the measure **Increasing the production and uptake of biomethane**, starting from 2027, there will be 3 new biogas production plants opening in Estonia. To calculate the impact of this measure, emissions in both cases can be compared – when the new biogas production plants will or will not be opened – that can be done by modifying the manure management systems distributions in both cases.

2.3.5. Land use, land-use change and forestry (LULUCF)

The **Forest Act (2007)**⁴⁰ provides the legal framework for managing the Estonian forests to ensure protection and sustainable management of the forest as an ecosystem. The Forest Act encompasses the reforestation measure aiming at the recovery of the forest after logging or natural disaster. According to the Forest Act, the forest owner is obliged to ensure reforestation at the latest within five years after the logging or natural disaster. Supporting the fast reforestation after logging favours consistent carbon capture on the woodland and hence preservation of the GHG capture level of Estonian forests. The state also supports private forestry by the training of private forest owners and agricultural advisers, and investments aimed at increasing the economic, ecological, social and cultural value of the forest. Voluntary protection of key habitats in forests is encouraged through compensation for private forest owners.

The main objectives of the **Nature Conservation Act (2004)**⁴¹ are the promotion and preservation of biodiversity, the preservation of the natural environments of cultural or aesthetic value, as well as the promotion of the sustainable use of natural resources. The Act also stipulates the application of compensatory measures for the Natura 2000 areas.

The **Estonian Forestry Development Plan until 2020 (EFDP 2020)**⁴² determined the forestry targets for 2011–2020 and described the measures and resources to achieve these targets. The main objective of the EFDP 2020 was to ensure forest productivity and vitality, and the diverse and efficient use of this resource. The EFDP 2020 also included measures for the protection of natural processes and threatened species. Financing of the EFDP 2020 measures that are considered in the projections continues and they are also likely to be included in the next Forestry Development Plan.

⁴⁰ Forest Act (2007). [www] <https://www.riigiteataja.ee/en/eli/ee/510022014001/consolide/current> (09.12.2024)

⁴¹ Nature Conservation Act (2004). [www] <https://www.riigiteataja.ee/en/eli/ee/515112018002/consolide/current> (09.12.2024)

⁴² Ministry of Climate (2011). Estonian Forestry Development Plan until 2020. [www] <https://kliimaministeerium.ee/sites/default/files/documents/2021-12/Eesti%20metsanduse%20arengukava%20aastani%202020%20%28kinnitatud%20Riigikogu%20otsusega%20nr%20909%20OE%2015.%20veebruari%202011.%20aastal%29.pdf> (09.12.2024)

The MoE (now the MoC) has prepared the draft **Forestry Development Plan until 2030 (EFDP 2030)**⁴³. Currently, the EFDP 2030 programme, or implementation plan, is being prepared. The aim of the development plan is to achieve a social agreement on the sustainable management of forests, taking into account social, economic, environmental and cultural aspects. Sustainable forestry means the management of forests in a way that ensures their current biological diversity, productivity, capability for regeneration, vitality and potential and enables the possibility to also perform all functions in the future, without causing harm to other ecosystems. The following planned policy directions have an impact on the LULUCF sector:

- adaptation of forestry to climate change – the aim is to increase the carbon sequestration and storage in forests in order to alleviate climate change and raise the resilience of forests to the effects of climate change;
- improving the state of biodiversity in forest ecosystems – forest management takes into account biodiversity, environmental and climate objectives;
- enhancing the competitiveness of the Forest sector – one aim of this policy is to ensure greater productivity, quality and good health status of forests;
- better valorisation of wood – more efficient and resource-efficient wood use is encouraged and supported in the forest and timber industries.

As of 2024, the **Environmental Charges Act (2006)**¹² includes the deforestation charge (see chapter 2.2), which is paid for the right to deforest forest land. The deforestation charge rate and the methodology for the calculation thereof is established by a regulation of the minister in charge of the policy sector.

According to the **Earth's Crust Act (2017)**⁴⁴, the owner of the extraction permit is obliged to restore the land disturbed by mining. The objective of the restoration is to adjust the land degraded by extraction to forest land, water body, land with recognised value or to any other kind of land that can be used for beneficial purposes.

In order to contribute to the preservation of Estonian semi-natural communities, an **action plan for semi-natural grasslands (2021–2027)**⁴⁵ has been drawn up. By 2027, the goal is to maintain heritage meadows on at least 50,000 hectares. Planned activities include continued funding for the maintenance of semi-natural communities and the restoration of new habitats, considering the coherence and species protection aspects.

European structural and investment funds and LIFE programme have supported several projects to preserve and restore Estonian protected habitats and semi-natural grasslands, and to restore the water level in abandoned cut-away peatlands and degraded wet habitats.

The **Environmental Protection and Use Programme for 2024–2027**⁴⁶ is based on sectoral development plans, with the main strategic basis being the Estonian Environmental Strategy

⁴³ Ministry of Climate (2023). Metsanduse arengukava 2021-2030. [www] <https://kliimaministeerium.ee/MAK2030> (09.12.2024)

⁴⁴ Earth's Crust Act (2017). [www] <https://www.riigiteataja.ee/en/eli/ee/513022017001/consolide/current> (09.12.2024)

⁴⁵ Ministry of Climate (2021). Action plan for semi-natural grasslands (2021–2027). [www] <https://kliimaministeerium.ee/sites/default/files/documents/2021-07/P%C3%A4randniitude%20tegevuskava%20%28kinnitatud%202021%29.pdf> (09.12.2024)

⁴⁶ Ministry of Climate (2024). Environmental Protection and Use Programme for 2024-2027. [www] <https://kliimaministeerium.ee/sites/default/files/documents/2024-02/Keskonnakaitse%20ja%20kasutuse%20programm%202024-2027.pdf> (21.02.2025)

2030⁴⁷. The goal of the programme is to ensure the protection of the environment and biodiversity, as well as sustainable and efficient use of the environment. The LULUCF sector is influenced by activities related to biodiversity protection and the direction of forestry development.

Several activities for supporting the private forestry and maintaining semi-natural habitats and Natura 2000 sites are (co-)financed through the CAP. Specific objectives set in Estonian CAP Strategic Plan 2023–2027 include contribution to climate change mitigation and adaptation by reducing GHG emissions and enhancing carbon sequestration and promoting the sustainable and efficient management of natural resources. Number of LULUCF measures are presented in Reportnet 3 policies and measures dataset.

Methodologies and assumptions used to estimate the GHG emission reductions or removals

Impacts of individual WEM scenario measures have not been estimated, as their effect on parameters that affect emissions (e.g. land-use changes, felling volume) has not been quantified in the development strategies/plans. The collective impact of the existing measures can be seen through the sector's projections as 2024 inventory submission data was used as the base for calculations. The WEM scenario generally assumes continuation of current land-use trends and management practices, methodologies for projecting GHG emissions/removals are described in chapter 3.2.5.1.

2.3.6. Waste management

The **Waste Act (2004)**⁴⁸ provides waste management requirements for preventing waste generation and the health and environmental hazards arising from waste, including measures for improving the efficiency of the use of natural resources and reducing the adverse impacts of such use and progressive reduction of landfilling of waste that is suitable for recycling or other recovery. The act also includes organisation of waste management including bases and extent of state supervision and liability for violation of the Act.

The **National Waste Plan 2023–2028 (NWP 2023–2028)**⁴⁹ adopted at the end of 2023, is a guiding document used to organize and set objectives for waste management in Estonia for the country as a whole, as well as for local authorities, businesses, producers and the general public. It describes the most important principles for the development of the sector and states the most important actions to be taken during the duration of the waste plan to achieve the waste policy objectives set out in the Waste Act and other related documents.

NWP 2023–2028 is based on the waste hierarchy principle, a principle stemming from the European Union Waste Framework Directive (WFD), which all Member States are expected to respect. The waste hierarchy consists of five stages: waste prevention - preparation for re-use – recycling of materials – other forms of waste recovery – disposal.

⁴⁷ Ministry of Climate (2007). Estonian Environmental Strategy 2030. [www] <https://kliimaministeerium.ee/sites/default/files/documents/2021-07/The%20Environmental%20Strategy%202030.pdf> (21.02.2025)

⁴⁸ Waste Act (2004). [www] <https://www.riigiteataja.ee/en/eli/ee/520012015021/consolide/current> (09.12.2024)

⁴⁹ Ministry of Climate (2023). National Waste Plan 2023–2028. [www] <https://kliimaministeerium.ee/sites/default/files/documents/2023-12/Riigi%20j%C3%A4%C3%A4tmekava%202023-2028.pdf> (09.12.2024)

NWP 2023–2028 is based on three strategic goals:

1. sustainable, conscious production and consumption, promotion of waste prevention and re-use;
2. increasing safe material circulation;
3. consideration of the effects of waste management on both the human and natural environment as a whole.

The **Circular Economy White Paper (2022)**⁵⁰ brings together the vision of the ministries and interest groups, the principles of the circular economy and the directions of circular economy development, which are the basis for future activities. The document supports various parties to make the circular economy an overarching framework in planning, consumption, production, politics, lifestyle, culture and values. In the future, the circular economy activity plan includes the activities and metrics of various fields which are highlighted.

Some of the themes from the Circular Economy White Paper related to waste management include minimizing waste production, improving the division of waste by type in the collection to enable higher rates of recycling, increased digitalization of the waste management system.

The revised **Urban Wastewater Treatment Directive (2024)**⁵¹ aims to protect human health and the environment through regulating wastewater treatment in the Member States. The renewal of the directive, not yet published, sets higher minimum standards than before for the quality of wastewater treatment from settlements of over 2000 and 10 000 inhabitants. Similarly to the current directive that is in force, it guides Member States to identify and protect sensitive areas and calls Member States to monitor the performance of treatment plants and receiving waters. As of 3 July 2023, Estonia had 56 wastewater collection areas with over 2000 population equivalent (p.e) and 474 smaller wastewater collection areas. Number of Waste management related measures are presented in Reportnet 3 policies and measures dataset.

Methodologies and assumptions used to estimate the GHG emission reductions or removals

Impacts of different measures in the Waste sector were not estimated due to missing base parameters. The collective impact of the existing measures can be seen through the sector's projections as 2024 inventory submission data was used as the base for calculations.

3. GREENHOUSE GAS EMISSION PROJECTIONS 2023–2055

3.1. Key assumptions and parameters used

The key underlying assumptions used in the projections are presented in Reportnet 3 dataset Table 2 and Table 3.

⁵⁰ Ministry of Climate (2022). The Circular Economy White Paper. [www] https://ringmajandus.envir.ee/sites/default/files/2022-06/Ringmajandus_valge_raamat.pdf (09.12.2024)

⁵¹ European Council. Urban wastewater: Council adopts new rules for more efficient treatment. [www] <https://www.consilium.europa.eu/en/press/press-releases/2024/11/05/urban-wastewater-council-adopts-new-rules-for-more-efficient-treatment/> (09.12.2024)

3.2. Sectoral WOM and WEM projections

Detailed information on sectoral projections with WOM and WEM scenarios are included in Reportnet 3 dataset Table 1a. GHG projections have been calculated using AR5 GWPs. Estonia has not presented for the 2025 submission ‘With Additional Measures’ (WAM) scenario as during the projection preparation period the discussions on the Climate Resilient Economy Act bill, where additional measures are proposed, was undergoing and therefore the WAM scenario was not prepared as not to prejudice the Climate Resilient Economy Act adoption process. By the time of submitting the 2025 projection submission, the 2025 GHG inventory submission for the years 1990–2023 has been finalised. To keep the consistency with the base year inventory (2024 NIR), emission for the year 2023 are projections and therefore might differ from the official 2025 GHG inventory estimates for the year 2023.

3.2.1. Energy (excluding transport)

3.2.1.1. Methodology

Projections of GHG emissions have been calculated for the period of 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission (2024 NIR) to the UNFCCC⁵². Two projection scenarios are presented – the WEM scenario evaluates future GHG emission trends under the current policies and measures and the WOM scenario illustrates a future where measure from WEM scenario wouldn’t be implemented.

The scenarios projecting GHG emissions in the Energy sector (excluding transport) are mainly based on the measures of the Ministry of Climate (MoC), which are funded through Environmental Investment Centre and the State Shared Service Center (e.g. funding from the Recovery and Resilience Facility as well as revenues from the EU ETS). In addition, the scenarios were updated based on certain inputs on parameters received from the Ministry of Climate and industries (incl. planned renewable energy capacities, use of various fuels etc.). Also, future EU ETS allowance price and GDP growth were taken into account. The GHG impact of the measures are mainly calculated through their energy saving or fuel exchange that they initiate.

The main assumption for electricity supply in the WEM scenario is that step-by-step, the use of oil shale shall decrease to produce electricity and increase to produce shale oil. The retort gas that occurs as a side product during the production of shale oil is used for electricity production. Information about the amounts of oil shale used in the shale oil industry and the amounts of retort gas produced is an input from the oil shale industry.

Electricity generation from wind and solar also substantially increases based on the input from the MoC. The projected future usage of fuels through the impact of the measures is applied for the calculations while using the emission calculations of the 2006 IPCC Guidelines.

⁵² Estonia National Greenhouse Gas Inventory Report 1990-2022 (2024). [www] https://kliimaministeerium.ee/sites/default/files/documents/2024-03/NID_EST_1990-2022_15.03.pdf (06.12.2024)

The projections for heat supply in the WEM scenario are based on the renovation rate of buildings, boilers and heat pipes. The projections also consider the building rate of new and dropout rate of old buildings.

3.2.1.2. GHG emissions projections

The Energy sector (excluding transport) includes GHG emissions from the consumption and production of fuels and energy (electricity and heat). The main sub-sectors in this sector are Energy industries; Manufacturing industries and construction; Other sectors, including Commercial/institutional (buildings), Residential (buildings), Agriculture/Forestry/Fishing/Fish farms (excluding mobile machinery, e.g. tractors, harvesters etc.) and Fugitive emissions from natural gas distribution. The GHG emission increase in 2022 (the base year) compared to the previous two years, came primarily from the Energy industries, because of the lack of power generation capacities, which led to higher electricity prices and made electricity production from oil shale profitable.

The Energy sector's projected emissions in the WEM and WOM scenarios, together with the 2024 NIR historic inventory information, are presented in [Figure 3.1](#). The WEM scenario evaluates future GHG emission trends under the current policies and measures and the WOM scenario illustrates a future where measure from the WEM scenario would not be implemented.

In the WEM scenario, the emissions are projected to decrease by 86.3% from 2022 to 2055. The largest absolute decrease occurs in the Energy industries.

The main electricity producer in Estonia is Enefit Power AS incl. the Eesti Power Plant and the Balti Power Plant. Both plants use mainly oil shale for electricity production. Enefit power plants are also the largest producers of GHG emissions in Estonia. The decrease in the WEM scenario is due to the phasing out of oil shale pulverised combustion in these plants, while using mainly a more effective Auvere oil shale combustion plant and fluidised bed combustion units in older plants. It is planned by the companies to capture CO₂ in solid heat carrier technology-based shale oil plants, which lead to further decrease in GHG emissions between the years 2040 and 2050. The GHG emissions are projected to decrease 94.5% by 2055 compared to 2022 in the Energy industries sector.

GHG emissions in the Manufacturing and construction sector (divided into iron and steel; non-ferrous metals; chemicals; pulp, paper and print; food processing, beverages and tobacco; non-metallic minerals; and other industries) are projected to increase by 60.5% by 2055 compared to 2022, as there are no concrete fuel swapping plans developed yet.

The emissions in Other sectors (Commercial/institutional (buildings), Residential (buildings) and Agriculture/Forestry/Fishing/Fish farms) are expected to decrease by 19.2% in 2055 compared to 2022.

In the WOM scenario, the emissions in the Energy sector are projected to increase by 9.2% during the period of 2022–2055, if the current measures and plans would not be applied. The increase of GHGs in the WOM scenario results from the lack of higher energy efficiency requirements for buildings (entails additional funding for renovation purposes) and district

heating networks, which help to decrease energy consumption for heat production. In addition, there is no CO₂ capturing by the shale oil industry.

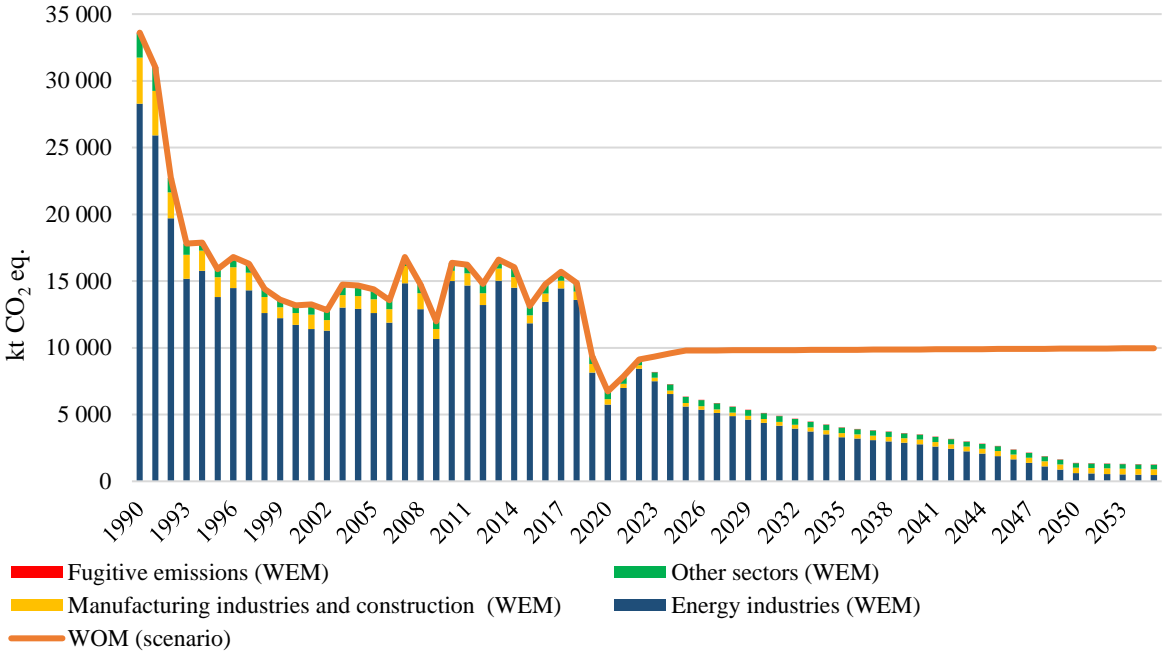


Figure 3.1. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) from the Energy sector (excluding transportation) according to the WEM and WOM scenarios, kt CO₂ eq.

3.2.2. Transport

3.2.2.1. Methodology

Projections of GHG emissions have been calculated for the period of 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission to the UNFCCC⁵². Two projection scenarios are presented – the WEM scenario evaluates future GHG emission trends under the current policies and measures and the WOM scenario illustrates a future where measure from WEM scenario wouldn’t be implemented.

Sybil baseline model⁵³ is used for the GHG projections in the road transport sector. The model uses a bottom-up approach requiring data about the vehicle fleet, technology (EURO class) and road activity. The biggest strength of the model is that it is compatibility with COPERT model⁵⁴, which is used for the compilation of road transport emission estimates in the national inventory report and kept up to date by EMISIA, the same team as for COPERT. Its weakness is the high time consumption of calculating the effect of each individual measure. For that reason, it is easier to calculate separately the effects of the measure and insert the sum effect into the model.

⁵³ Sybil baseline model. [www] <https://copert.emisia.com/sybil-baseline/> (06.12.2024)

⁵⁴ COPERT model. [www] <https://copert.emisia.com/> (06.12.2024)

The projections in the Transport sector are based on the information and parameters from the ITF report “The Future of Passenger Mobility and Goods Transport in Estonia”²⁶, the TalTech report “Traffic survey manual and the business as usual forecast”⁵⁵ and the Ministry of Climate.

For instance, rail diesel projected consumption is based on five-year historical values (2018–2022) from the 2024 NIR. Changes in national aviation traffic are derived from the EUROCONTROL Aviation Outlook 2050⁵⁶, while maritime traffic adjustments are referenced from the 2024 NIR report. CO₂ emission metrics, such as those for new passenger vehicles (in gCO₂/km) and heavy trucks (as a percentage compared to 2019), are sourced from EU regulations. Additionally, data on vehicle purchases, categorized into new and used cars or trucks, is provided by AMTEL (Association of Estonian Car Sales and Service Companies)⁵⁷. This comprehensive parameter selection ensures a robust foundation for the evaluation, leveraging reliable and diverse sources to guide the projections.

To estimate GHG emissions, emission factor data from the 2006 IPCC and EMEP/EEA 2019 Guidebook along with country-specific emission factors are used.

The projections for the WEM scenario are also in line with Regulation (EC) No 2019/631 of the European Parliament and of the Council. In addition, it is also taken into account that by 2035, the average emissions target for a new passenger car is 0 gCO₂/km and 130 gCO₂/km for light duty vehicles.

3.2.2.2. GHG emissions projections

Transport section projections of GHG emissions have been calculated for the period of 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission to the UNFCCC⁵². Two projection scenarios are presented – the WEM scenario evaluates future GHG emission trends under the current policies and measures and the WOM scenario illustrates a future where measure from the WEM scenario would not be implemented.

The main share of GHG emissions in the Transport sector originate from road transport. In 2022, the share of GHG emissions from Road transport was around 89.7% of total GHG emissions of the Transport sector.

The emissions in the Transport sector’s WEM scenario are expected to decrease by 66.3% in 2055 compared to 2022. In the WEM scenario, Domestic aviation emissions are expected to increase by 2.25 kt CO₂ eq. during the period of 2023–2055 and in Domestic navigation, Railroad and Road transport emissions are projected to decrease compared to the base year. The largest emission reductions occurs in the Road transport sector (emissions are projected to decrease in both the WEM and WOM scenarios) – emissions are projected to decrease by 71.5% in 2055 compared to 2022 to a total of 676.7 kt CO₂ eq. in the WEM scenario, which is the result of implementing measures that will help lower the demand for private transport and

⁵⁵ Kaal, L.; Metsvahi, T.; Kendra, A. (2020). Liiklusuuringu juhendi ja baasproгноosi koostamine. Tallinna Tehnikaülikool. [www] https://transpordiamet.ee/sites/default/files/documents/2021-11/bp-2050_aruanne.pdf (06.12.2024)

⁵⁶ EUROCONTROL Aviation Outlook 2050 (2022). [www] https://www.eurocontrol.int/archive_download/all/node/13448 (06.12.2024)

⁵⁷ Autode müügi- ja teenindustevõtete Eesti Liit. [www] <https://amtel.ee/> (06.12.2024)

switching public transport to alternative fuels. However, the biggest driver for the steep decrement of GHG emissions in the WEM scenario is the uptake of electric vehicles. Although there are measures implemented that help to decrease the overall projected mileage of the road transport fleet, they aren't currently enough to reverse the mileage upward trend.

As Road transport emits the biggest share of GHGs in the Transport sector, a lot of measures focus on decreasing the GHG impact from Road transport. However, there are measures being implemented that are also directed towards railroad and domestic navigation. The focus in railroad is electrification and in domestic navigation replacing ferries, which run on diesel for alternative fuel (electricity/hydrogen) ferries.

In the WEM scenario, GHG emissions are lower by 433.85 kt CO₂ eq. compared to the WOM scenario in 2055. The difference comes mainly from the measures that are being implemented and the biggest contributor in the decrease is Road transport.

The total projected GHG emissions in the WEM and WOM scenarios are presented in [Figure 3.2](#).

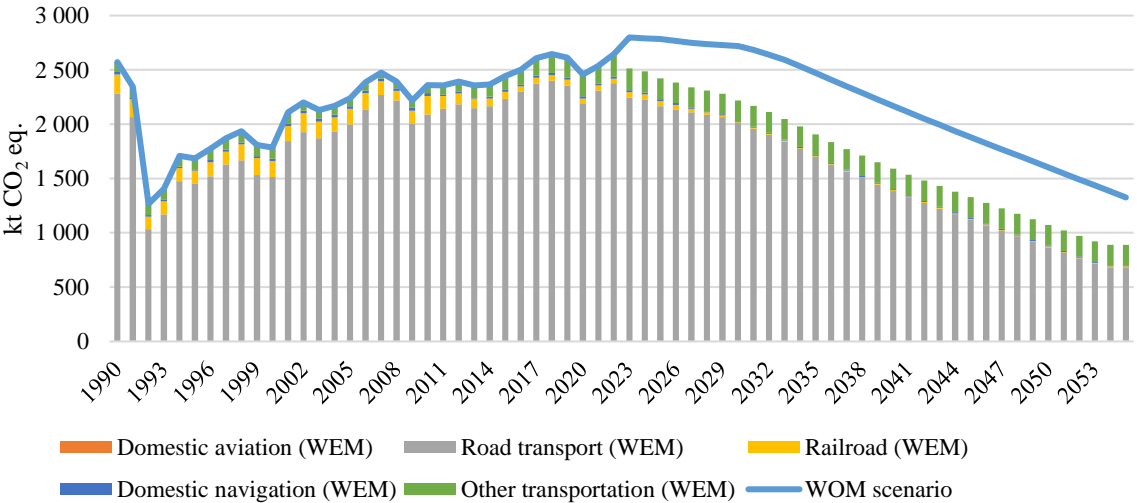


Figure 3.2. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) from the Transport sector in the WEM and WOM scenarios, kt CO₂ eq.

3.2.3. IPPU

3.2.3.1. Methodology

WEM projection scenario for GHG emissions has been calculated for the period 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission to the UNFCCC⁵². Emissions from the IPPU sector are projected according to the WEM scenario, which evaluates future GHG trends under current policies and measures.

The Estonian industry sector is relatively small. The majority of emissions from subcategories, such as the Mineral industry, Non-energy products from fuels and solvents, and Other product

manufacture, as well as their respective subcategories, comprise emissions from the activity of only a few companies who also influence the emissions' trend. In most subsectors bottom-up data gathering, companies' production forecasts, population projection (by Statistics Estonia), the long-term real GDP growth rate (by the Ministry of Finance) and expert judgements are combined and used. This approach ensures the most proximate projections that reflect the actual situation in subcategories with a limited number of emitting agents.

The Mineral industry's projected emissions are based on previous inventory trends and industries' operator projections, where input was received taking into account planned production capacities and/or maximal production capacities according to companies' environmental permits. The Chemical (ammonia) industry is no longer active in Estonia and emissions from this sector are 0. The Metal industry's projected emissions are based on previous trends.

Emissions from urea-based catalyst AdBlue are projected taking into account:

1. broadening of NO_x emission standards to light vehicles (Euro 6 standards);
2. the forecast of the number of vehicles and their average fuel consumption, which is consistent with the projections of the Transport sector.

Emissions of fluorinated gases are projected according to the GHG inventory's calculation methods. Emissions from each group of HFC-containing equipment are projected separately. Bans and restrictions stipulated in the Regulation (EU) No 2024/573³⁰ and Directive 2006/40/EC³¹ are taken into account in the projections.

Emissions are calculated from large and small commercial refrigeration equipment, industrial refrigeration and cooling, stationary air conditioning/cooling, mobile refrigeration, mobile air conditioning, fire protection equipment and foam producing by taking the following bans from Regulation 2024/573 into account:

1. bans on placing on the market;
2. ban of refilling equipment that contains HFCs with certain GWP.

It is assumed that due to the new F-gas regulation the majority of commercial and industrial refrigeration is switching to alternative refrigerants (CO₂, NH₃ and HF based systems respectively). It is assumed that HFC refrigerants are properly collected from discharged equipment.

SF₆ emissions (from Other product manufacture and use category) are regulated by the Regulation (EU) 2024/573. The plans of SF₆ electrical network operators and emissions from equipment in operation are taken into account.

Consumption of N₂O in aerosols is calculated with the projection of population size.

3.2.3.2. GHG emissions projections

Emissions from the IPPU sector are projected only according to the WEM scenario.

The overall emissions from the IPPU sector are projected to decrease by 70% from 2022 until 2055 in the WEM scenario. The main decrease comes from the product uses as substitutes for ODS (F-gases).

The emissions from Mineral and Metal industry by 2055 are estimated to remain on a similar level to 2022.

Emissions (both direct and indirect CO₂) from non-energy products from the Fuels and solvent subsector use (2.D.3) are projected to decrease in the WEM scenario – 7.7% from 2022 until 2055. Emissions from most subcategories (Use of diesel exhaust fluid AdBlue, lubricants and solvents) are projected to decrease and emissions from the subcategory paraffin wax use are projected to increase. A smaller part of these emissions are the CO₂ emissions from urea containing diesel exhaust fluid use which decrease by 39% from 2022 until 2055 in WEM scenario. Emissions from lubricants are projected to decrease by 14% from 2022 until 2055 based on the average consumption during the years 2020–2022.

Emission of NMVOCs from the Solvents sector and indirect CO₂ from NMVOCs is projected to decrease by 11% from 2022 to 2055. The consumption of solvent containing products has had an upward trend in recent years but when taking into account a longer trendline (10 years) then a declining trend is foreseen.

Emissions of HFCs (substitutes for ozone-depleting substances (ODS)) are projected to decrease by 95% from 2022 to 2055 mainly due to the bans set out in the F-gas Regulation. The majority of R-404A containing equipment (to which installation and servicing bans apply from 2020) should be decommissioned until 2035. The same applies to most old split-type air conditioners and heat pumps.

Directive 2006/40/EC has a gradual effect on HFC emissions until 2030 when most old vehicles equipped with HFC-134a based air conditioners should be replaced (when taking account the average lifespan of a car).

Emissions of SF₆ reported under the subcategory Other product manufacture and use are projected to rise steadily until 2037 because additional switchgears are needed. SF₆ insulated electrical equipment is directly affected by the new F-gas Regulation. From the year 2038 emissions start to decrease due to the bans set in the regulation although staying 56% higher by 2055 compared to 2022 emissions. As the lifetime of SF₆ equipment is considered to be 40 years then emissions from the switchgear are projected from the equipment in operation until 2055.

N₂O emissions from the subcategory Other product manufacture and use are projected to decline from 2022 to 2055 by 11% as the use of N₂O in the medical applications and technical aerosols (e.g. whipped cream cans) is connected to declining population numbers.

The historical and projected emissions from 1990–2055 according to WEM scenario are depicted in [Figure 3.3](#).

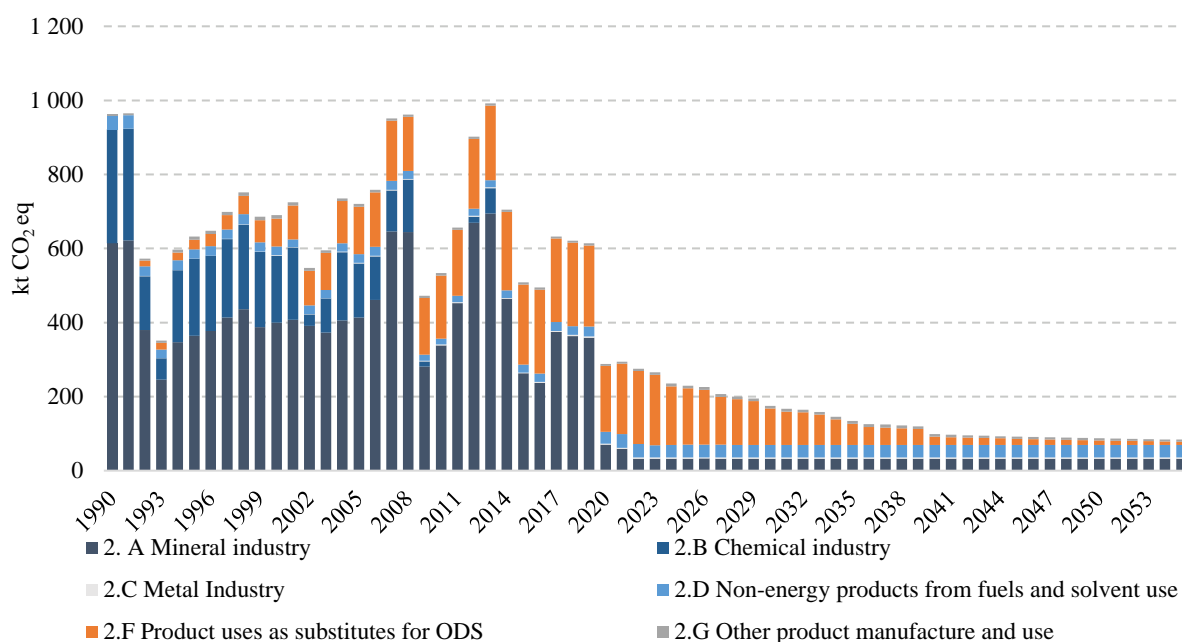


Figure 3.3. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) from the IPPU sector according to the WEM scenario kt CO₂ eq.

3.2.4. Agriculture

3.2.4.1. Methodology

Projections of GHG emissions have been calculated for the period of 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission to the UNFCCC⁵². Projections of emissions are calculated based on the 2006 IPCC methodology applied in the Estonian Greenhouse Gas Inventory. Two projection scenarios are presented – the WEM scenario evaluates future GHG trends under current policies and measures and the WOM scenario reflects the situation where all the measures from the **Common Agricultural Policy (CAP) Strategic Plan 2023–2027** are not applying from the year 2024.

In the **WEM scenario**, the projected numbers of animals, crop productions, the amounts of mineral and lime fertilizers used are based on the results of the Agriculture Projection Model (APM), developed in 2021 by the Centre of Estonian Rural Research and Knowledge. The model projects the data for the next ten years, so for the years 2023–2033. Projected activity data for the period 2033–2055 is interpolated. The APM model considers the characteristics common to Estonia and provides opportunities to analyze different policy scenarios and changing market and macroeconomic conditions. All animal numbers from the APM results are rounded to an integer. Also, annual average sheep, goat and poultry numbers were calculated for keeping consistency with the GHG inventory methodology. The quarterly sheep and goat numbers are divided with the last five-year average ratio to sheep and goats, respectively, used in the inventory. Poultry, layers and other poultry projections are based on the APM result, as

well as projections for the population of horses. The total number of broilers is projected based on the last five years' data from the 2024 NIR. The number of other hens and roosters is calculated based on the average ratio of the animal group to Poultry total population used in the 2024 NIR. To project the rabbit population year 2022 value was used from the 2024 NIR until the year 2055.

The highest impact on CH₄ emissions comes from Enteric fermentation due to the projected increase of dairy cattle population and milk yield. Agricultural Soils is the second largest GHG emission source in Estonia, of which emissions are mostly driven by synthetic N-containing fertilizers applied to soils, however also organic soils cultivation, crop production, other organic fertilizers applied to soils (such as compost, sewage sludge and waste-based digestates), and data about mineralization are affecting the total projections. Other categories, e.g. Manure management (driven by the livestock numbers and manure management systems distribution), CO₂ emissions from Liming and Urea fertilization do not have a significant impact on the GHG emission trend.

Main activity data for calculating CH₄ emissions from Enteric fermentation and CH₄ and N₂O emissions from Manure management are livestock population, distribution of animal waste management systems (AWMS) and milk yield and pregnancy rate for dairy cows. Estonia-specific volatile solids (VS) and Nitrogen excretion rates (kg/head/year) of dairy cattle have been calculated on the basis of projected milk yields. For projecting the number of animals, the purchase price of agricultural products is taken into account in the APM, the future direction of which is related to the corresponding price changes of meat and cheese presented in the OECD-FAO Agricultural Outlook prognosis⁵⁸ (OECD-FAO) report published in 2023. The influencers are the price of forage, which in the case of herbivores depends indirectly on the price of fuel (the production cost of grass fodder) and in the case of grain eaters on the price of wheat. Production-related subsidies paid for the respective animal species are taken into account as a price supplement, the budget of which is reduced per production unit.

At the end of 2023, there were a total of 241,400 cattle, including 83,300 dairy cows and 28,700 suckling cows. In a ten-year perspective, in the WEM scenario, it is projected that the number of dairy cows will increase by 1,108 heads and the number of suckling cows will decrease by 994 heads, so the total number of cattle by 2033 would be 0.5% higher than in 2023. The number of cattle is projected to stay at the 2033 level until 2055. At the same time, milk production per cow is projected to increase by 22% in ten years, and total milk production by 23% by the year 2033. After 2033, milk production is projected to stay at that the same level until 2055. Developments for increasing the herd of dairy cattle and their milk yield will be supported by the direct production-related subsidies paid per dairy cow and suckling cow and the interrelationship between the purchase price of milk and feed costs.

At the end of 2023, there were a total of 275,000 pigs, including 24,100 sows. It is predicted that the number of pigs will increase by 7% in a ten-year perspective, reaching 293,230 animals

⁵⁸ OECD-FAO Agricultural Outlook 2022-2031 (2023). [www] [https://data-explorer.oecd.org/vis?lc=en&df\[ds\]=DisseminateFinalDMZ&df\[id\]=DSD_AGR%40DF_OUTLOOK_2022_2031&df\[ag\]=OECD.TAD.ATM&df\[vs\]=1.0&dq=OECD.A.CPC_0111...&pd=2010%2C2031&to\[TIME_PERIOD\]=false](https://data-explorer.oecd.org/vis?lc=en&df[ds]=DisseminateFinalDMZ&df[id]=DSD_AGR%40DF_OUTLOOK_2022_2031&df[ag]=OECD.TAD.ATM&df[vs]=1.0&dq=OECD.A.CPC_0111...&pd=2010%2C2031&to[TIME_PERIOD]=false) (12.12.2024)

in 2033. After 2033, the number of pigs is projected to stay at the same level until 2055. The number of pigs is affected by the predictable ratio of wheat and pork prices.

At the end of 2023, there were a total of 58,700 sheep and goats, including 27,400 ewes and female goats. It is predicted that the number of sheep and goats will decrease by 15%, and by 2033 there will be 53,888 sheep and goats. After 2033, the number of sheep and goats is projected to stay at that the same level until 2055. The number is affected by the production-related subsidy for ewe and female goats. The assumption of the APM model is that the producer wants to maintain their income according to the market situation. If the price or the subsidy decreases, the herd should be increased, and if the price or the subsidy increases, there is no direct need to increase the herd.

At the end of 2023, there were 2,211,775 poultry, including 662,500 laying hens. The number of poultry is projected to increase to 2,229,798 in 2033 and stay at that level until 2055. The poultry population in the projections is affected by the change in the price of wheat (as a feed cost).

The number of horses is projected to decrease a bit in 2023 compared to 2022, then rise from 4,900 to 7,182 animals in 2024 and then stay at that level until 2055. The population of rabbits is projected to stay at the 2022 year level from the 2024 NIR until the year 2055. The population of fur animals will decrease steadily to zero in 2026, when fur farms will be banned in Estonia.

Feed intake parameters and the methane conversion rate are harmonized with the national GHG Inventory. Gross energy intake of dairy cows is calculated on the basis of projected milk yields. Fat content in milk (%) for the projected period is assumed to remain at the same level as in 2022 (3.95%) until 2055.

Projected N₂O emissions from the Agricultural soils subsector are based on the amounts of organic and synthetic N-containing fertilizers applied to soil, quantities of harvested crops, carbon stock change in mineral soils, and area of cultivated organic soils. Direct N₂O emissions include emissions from synthetic and organic fertilizers applied to agricultural soils, emissions from animal waste, emissions from crop residues, emissions from the cultivation of organic soils and emissions from mineralization associated with loss of soil organic matter. Indirect N₂O emissions include emissions from atmospheric deposition and from leaching and run-off. The quantities of sewage sludge and composted organic waste applied to soils are harmonized with the Waste sector projections (see Waste sector GHG projections chapter), data for calculating carbon stock change in mineral soils and organic soils cultivation are provided by the LULUCF sector expert. The projections on the use of synthetic fertilizers are projected by the APM. The amounts of N-containing fertilizers are projected to decrease by 8.5% compared to 2022 by the year 2055. Fertilizer use is estimated taking into account the crop yield and the amount of N, P₂O and K₂O fertilizers used for this purpose according to the calculation of the marginal revenue at a given yield level. Estonia's crop production is projected also with the APM model. The yield of crop production is most affected by weather conditions, as well as the price ratio of fertilizers and product. As a price margin, the budget for area-related subsidies for the amount of production has been taken into account. The future price direction is shaped by the price of wheat shown in the OECD-FAO 2023 report. Based on historical data, it is

assumed that the current weather conditions will continue, and that the farmers will base their decisions on cost efficiency – for every euro spent on fertilizer, they would want to get back a certain income per ha. Based on these assumptions, the predicted yield on cereals and rape varies from -6% (buckwheat) to +15% (spring barley). The development of technology is not considered in the projections model. The total production is found through multiplication of the area of the agricultural crop and the yield of the crop. The volume of the total production of cereals will decrease by 10% by 2033, for rape and rapeseed by 13%, for legumes by 3%.

The area of agricultural land covered with lime fertilizers has been added to the projections model according to the CAP Strategic Plan 2023–2027, and the amount used is based on historical data based on the amount given per hectare. Therefore, emissions from liming are projected to decrease by 9.88% by the year 2055 compared to 2022.

In the **WOM scenario**, the projected numbers of animals, crop productions, the amounts of mineral and lime fertilizers used are also based on the results of the Agriculture Projection Model (APM). According to the WOM scenario, all support measures of the CAP Strategic Plan taken into account in the projections model will not be implemented as of the year 2024. The subsidy budget of the CAP Strategic Plan is included in the projections model as an addition to the market price of production, so if the subsidies are removed, the income per unit of production will decrease and the ratio of input costs and product prices will change. As a result of this scenario, the agricultural land area would decrease by 53,410 ha in the case of cereals, and the growing area of more profitable crops would increase (wheat, barley; total of 3% by 2055), the leguminous area would significantly decrease (by 78%) by 2055, as the growing area of legumes is strongly related to environmental subsidies. Fertilizer use would decrease depending on crop surface changes by 3% for mineral N-containing fertilizers. Due to a 1% reduction in dairy cows, the total amount of milk production would also decrease. The loss of subsidies will have a greater impact on beef cattle and sheep and goat breeding, where the income of the herd would be increased by 14% and 36%, respectively. The number of poultry and pigs is not affected by this scenario.

3.2.4.2. GHG emissions projections

Agriculture sector's projections of GHG emissions have been calculated for the period of 2023–2055. The reference year 2022 used in the projections is consistent with Estonia's 2024 GHG inventory submission to the UNFCCC⁵². Two projection scenarios are presented – the WEM scenario evaluates future GHG emission trends under the current policies and measures and the WOM scenario illustrates a future where some measure from the WEM scenario would not be implemented.

According to the WEM scenario, the emissions from the Agriculture sector will increase from 1,577.89 kt CO₂ eq. in 2022 to 1,595.3 kt CO₂ eq. (0.14%) by 2055 (see [Figure 3.4](#)). Emissions are projected to increase in Enteric Fermentation and in Urea application sub-sectors, in other sub-sectors (Manure Management, Agricultural Soils and Liming), the emissions are projected to decrease. The increase in the Enteric fermentation sub-sector between 2022–2055 is projected to be 56.34 kt CO₂ eq. and it is caused mainly by slightly higher dairy cow population and the increase in milk yield per cow. Decrease in the Manure management sub-sector between

2022–2055 is projected to be 9.65 kt CO₂ eq. and is mainly caused by the opening of new biogas production plants, in Agricultural soils the decrease of 41.14 kt CO₂ eq. between 2022–2055 is caused mostly by lower crop production and fertilizer usage, in Liming sub-sector the decrease of 3.56 kt CO₂ eq. is caused by lower lime fertilizer usage projections, and in Urea application sub-sector the emissions are projected to increase by 0.24 kt CO₂ eq. in 2055 compared to 2022.

According to the WOM scenario, emissions will increase from 1,577.89 kt CO₂ eq. to 1,605.23 kt CO₂ eq. (0.77%) by 2055. Differences between WEM and WOM scenarios are caused by not implementing the support measures from the CAP 2023–2027 as of the year 2024. As a result, in the WOM scenario, the agricultural land area would decrease by 53,410 ha in the case of cereals, and the growing area of more profitable crops would increase (wheat, barley; +3% by 2055), the leguminous area would significantly decrease (-78% by 2055), as the growing area of legumes is strongly related to environmental subsidies. Also, fertilizer use would decrease depending on crop surface changes by -3% for mineral N-containing fertilizers. This will affect the emissions from Agricultural Soils category. Due to a 1% reduction in dairy cow population, the total amount of milk produced would also decrease. The loss of subsidies will have a greater impact on beef cattle and sheep and goat breeding, where the population of the herd would have to be increased by 14% for beef cattle and 36% for sheep and goats, to maintain the current income that the producer receives with all the subsidies applied. The number of poultry and pigs are the same for WOM and WEM scenarios. The animal population numbers and milk yield per dairy cow mostly affect Enteric fermentation and Manure management categories where the emissions will be higher in the WOM scenario than in the WEM scenario.

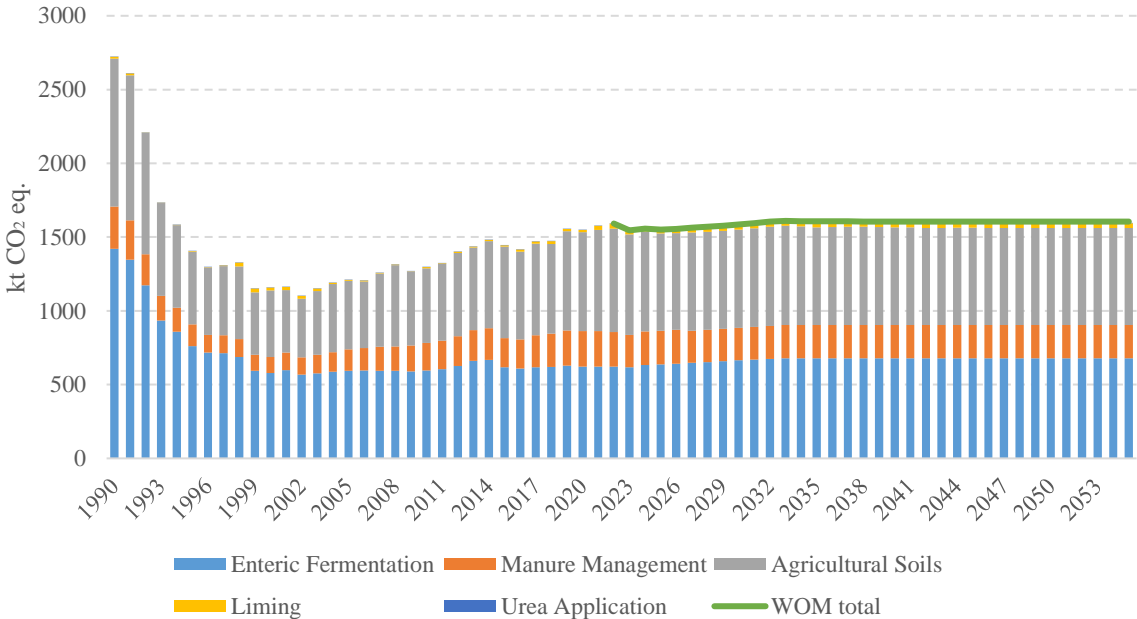


Figure 3.4. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) from the Agriculture sector in the WEM and WOM scenarios, kt CO₂ eq.

3.2.5. Land-use, land-use change and forestry (LULUCF)

3.2.5.1. Methodology

Two projections scenarios of GHG emissions have been calculated for the period 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission to the UNFCCC⁵². The WEM scenario evaluates future GHG emission trends under current policies and measures. The second scenario, WOM reflects the situation where all the measures from the Common Agricultural Policy (CAP) Strategic Plan 2023–2027 are not applying from the year 2024.

Land use projections are based on the following assumptions and planned activities:

- annual land conversions will generally continue to occur at the same level as the average of 2018–2022, except for the conversions described below;
- deforestation of 1200 ha of Forest land due to the restoration of heritage meadows (Grassland category) is divided equally between 2023–2027 in the WEM scenario (MoC);
- the construction of Rail Baltic is expected to increase the area of Forest land converted to settlements by 806 ha in the period of 2023–2028;
- deforestation due to the establishment and development of training grounds of the Estonian Defence Forces is considered under Forest land converted to other land category. Total projected deforested areas in 2024–2029 are ~7,120 ha (Estonian Centre for Defence Investment);
- shares of drained organic soils from the total area of organic soils for Forest land and Grassland are projected as an average of 2018–2022.

Projected areas of land use categories and methods described in the NIR 2024 Chapter 6 were used for estimating GHG emissions and removals. Additional assumptions for specific categories are stated below.

GHG projections for Forest land are based on the business-as-usual scenario composed by the Estonian Environment Agency. The following assumptions and methods were applied:

- Total felling volume in 2024–2062 is expected to be 11 mln m³ year⁻¹ (incl. final fellings 9 mln m³ year⁻¹), which is the average of five felling seasons.⁵⁹ In 2023, the felling volume 12.1 million m³ year⁻¹ has been used as an expert assessment. In the period 2043–2052, the total felling volume decreases to 10.8 mln m³ year⁻¹, and in 2053–2062 to 9.2 mln m³ year⁻¹, due to the diminishing area of mature forest stands available for wood supply;
- In modelling the final fellings, actual harvesting distribution between dominant tree species in recent years is used. The calculation of the final felling area is only applied

⁵⁹ Estonian Environment Agency, National Forest Inventory 2023 (2024). Fellings by felling types and forest ownership according to National Forest Inventory. [www] <https://tableau.envir.ee/views/SMI/28Raieaegrda?%3Aembed=y&%3Aiid=1&%3AisGuestRedirectFromVizportal=y> (21.02.2025)

in the case of forest available for wood supply. Strictly protected forests are modelled without fellings;

- Final fellings are projected by dominant tree species and site quality classes depending on the age, diameter and stocking of the stand;
- The growing stock volume in Forest land is projected by decade and is obtained by multiplying the area in age class with the average growing stock per hectare in the relevant age class;
- Distribution of forest area by dominant tree species remains the same during the entire period;
- The area of the forest not available for wood supply (strictly protected area) is 482.5 kha⁶⁰. It is projected to remain at the same level;
- In the case of forest available for wood supply with additional protective measures (excluding water protection forests on banks), in total 219.6 kha, half of the uniform final felling coupe intensity is applied;
- Growing stock in Forest land remaining forest land is calculated as the difference between projected value for total forest land and estimated Land converted to forest land growing stocks;
- Living biomass in Forest land remaining forest land in 2023 is calculated using preliminary harvesting estimates;
- Dead wood C stocks in Forest land remaining forest land are expected to increase in the future due to natural disturbances. Therefore, the 2020–2022 period average net removals by the dead wood pool are increased by 10% for the projections;
- Non-CO₂ emissions from drained organic forest soils are estimated by multiplying the 5-year average emissions per hectare by the projected area.

Estimations for the HWP pool are based on the projected harvest levels. The fraction of harvest for the HWP commodity production and the share of HWP commodities are assumed to remain at the current level, except for wood-based panels (the factory, which produced particle boards, was closed, and the production is projected as zero).

For calculating C stock changes in the mineral soils of the Cropland remaining cropland category, areas under different crops are projected based on the results of the Agriculture Projection Model (APM) developed by the Centre of Estonian Rural Research and Knowledge³⁹. The same model was also applied in the Agriculture sector. According to the APM base scenario, the utilized agricultural area will remain stable until 2033, with no significant changes expected in land use. After 2033, the crop areas are projected to stay at the same level until 2055. It is assumed that the present management practices (shares of areas under full tillage, reduced tillage and no-till) will continue.

⁶⁰ Estonian Environment Agency, National Forest Inventory 2023 (2024). Distribution of protected forest area by reasons of protection. [www] <https://tableau.envir.ee/views/SMI/5Kaitsephjused?%3Aembed=y&%3Aiid=1&%3AisGuestRedirectFromVizportal=y> (21.02.2025)

Most emissions from the Wetlands category derive from the horticultural use of peat. The amount of peat removed for horticultural use is calculated as the difference between total peat production and the primary production of energy peat. The projected annual peat extraction (884 kt) is estimated as the average of the period 2019–2023. The use of energy peat has had a declining trend which is expected to continue, and, after 2035, all extracted peat is projected to be used in horticulture. Country-specific carbon fraction of peat is used in calculations and peat is assumed to be oxidized in the year of extraction. The area of peat extraction sites was 25.81 kha in 2022 and the same area is also applied in projections.

CH₄ and N₂O emissions from wildfires are estimated as the average of the period 2018–2022. Reported and projected non-CO₂ emissions from biomass burning in Land converted to forest land areas are included under the Forest land remaining forest land category. Similarly, CH₄ and N₂O emissions from biomass burning in the Grassland remaining grassland category also include emissions from Land converted to grassland and Wetlands categories. GHG emissions from wildfires are not estimated for Croplands and Settlements as they are considered insignificant in terms of the overall level and trend in national emission.

The WOM scenario differs from the WEM scenario only for the Cropland category and is in line with the WOM scenario for the Agriculture sector. According to the WOM scenario, all support measures of the CAP Strategic Plan considered in the Agriculture Projection Model will not be implemented as of the year 2024. The subsidy budget of the CAP Strategic Plan is included in the projections model as an addition to the market price of production, so if the subsidies are removed, income per unit of production will decrease and the ratio of input costs and product prices will change. As a result of this scenario, the agricultural land area would decrease by 53,410 ha by 2033.

2.3.1.1. GHG emissions projections

Two projections scenarios of GHG emissions have been calculated for the LULUCF sector. The WEM scenario evaluates future GHG emission trends under current policies and measures whereas the WOM scenario reflects the situation where all the measures from the Common Agricultural Policy (CAP) Strategic Plan 2023–2027 are not applying from the year 2024.

According to the WEM scenario projections, the LULUCF sector is expected to remain a source of GHGs, meaning that total emissions arising from the sector will exceed total removals. Total emissions will increase from 339.29 kt CO₂ eq. in 2022 to 419.02 kt CO₂ eq. by 2055. The projections do not reflect annual fluctuations, rather expected decadal trends. The exception is 2023, for which activity data were partially available and were considered in calculations. The projected emissions (3,704.75 kt CO₂ eq.) for 2023 are the highest of the entire period (see [Figure 3.5](#)).

The LULUCF sector includes emissions and removals of GHGs from Forest land, Cropland, Grassland, Wetlands, Settlements, Other land and Harvested wood products (HWP). Indirect N₂O emissions from nitrogen leaching and runoff are accounted for in the land categories' net emissions and have not been reported separately.

C balance in Forest land is affected by several factors, including changes in the area of forest land, age structure of forests, and the felling volumes. The WEM scenario assumes the continuation of current forest management practices and intensity (total felling volume is 9.2–11 mln m³ year⁻¹). Total forest growing stock changes were projected as ten-year averages. Due to the high proportion of mature and premature forest stands and increasing proportion of forest area belonging to the first development classes (treeless area, area under regeneration and young stands), the capacity of carbon sequestration in tree biomass has decreased in recent years and the decline is expected to continue during the next decades. According to the WEM scenario, total forest growing stock will be approximately 6.8% lower in 2053 than it is now. In addition, conversion from other land categories to Forest land has been slowing in recent years, and in the future, cumulative areas of Land converted to forest land categories will decrease further. Net emissions from the Forest land category will generally increase compared to the base year of 2022, when they were -1,359.71 kt CO₂ eq. Highest emissions are projected for 2023 (1,894.90 kt CO₂ eq.), as the preliminary estimate for 2023 exceeds the felling volume of 2022 and the projected felling volume for the period of 2024–2055. After 2023 the net emissions will decrease and remain relatively stable (551.70 kt CO₂ eq. for the period 2024–2053). Then, as the forest growing stock is expected to increase, the net removals will increase also, reaching -1,402.80 kt CO₂ eq. in 2055.

C sequestration in HWP will decrease from -641.58 kt CO₂ eq. in 2022 to -343.87 kt CO₂ eq. by 2055. Main part of the HWP sink is from the wood panels and sawnwood subcategory. C sequestration in HWP was decreasing in 2022 due to reduced production of sawnwood and wood-based panels (the factory, which produced particle boards, was closed) and from 2023 onwards, particle board production will no longer continue under the projections.

Emissions from the Cropland category are expected to decrease compared to the base year (852.28 kt CO₂ eq. in 2022). In particular, emissions from mineral soils will be reduced, as agricultural land use and management practices are not expected to change significantly in the future, leading to the stabilization of soil organic carbon stocks. The projected emissions from the Cropland category are 630.60 kt CO₂ eq. in 2055.

Net emissions from the Grassland category were -171.97 kt CO₂ eq. in 2022. As the area of grassland decreases, as well as conversion of croplands to grasslands, carbon sequestration on grasslands will also decrease by 2055. In addition, emissions from deforestation are expected to increase. In 2055, the projected emissions from the Grassland category are -85.98 kt CO₂ eq.

In total, projected emissions from the Wetlands will decrease from 1,307.30 kt CO₂ eq. in 2022 to 1,142.37 kt CO₂ eq. in 2055. Of this, 961.96 kt CO₂ eq. result from the use of horticultural peat and 166.89 kt CO₂ eq. are emitted by peat extraction sites. Projected emissions are lower compared to the base year, because the peat extraction volume in 2022 was higher than the 2019–2023 average applied in the projections.

Under the Settlements and Other land categories, only emissions arising from the land conversions have been reported and projected. The construction of the Rail Baltic route will increase the land conversion to Settlements and related emissions. Projected emissions will rise from 322.18 kt CO₂ eq. in the base year to 432.20 kt CO₂ eq. in 2055. Deforestation resulting from the establishment and development of training grounds of the Estonian Defence Forces

up to 2030 is considered under the Other land category. Projected emissions for the Other land will peak at 515.20 kt CO₂ eq. in 2029, and then decline to 46.49 kt CO₂ eq. in 2055, which is 51.0% higher compared to the base year.

The WOM scenario differs from the WEM scenario only for the Cropland category and assumes that all support measures of the CAP Strategic Plan will not be implemented as of the year 2024. This would cause a decrease in cultivated land area and increase in soil carbon sequestration. According to the WOM scenario, GHG emissions are lower by 68.23 kt CO₂ eq. compared to the WEM scenario in 2043, after that the soil organic carbon stock will stabilize and emissions will be at the same level than in the WEM scenario.

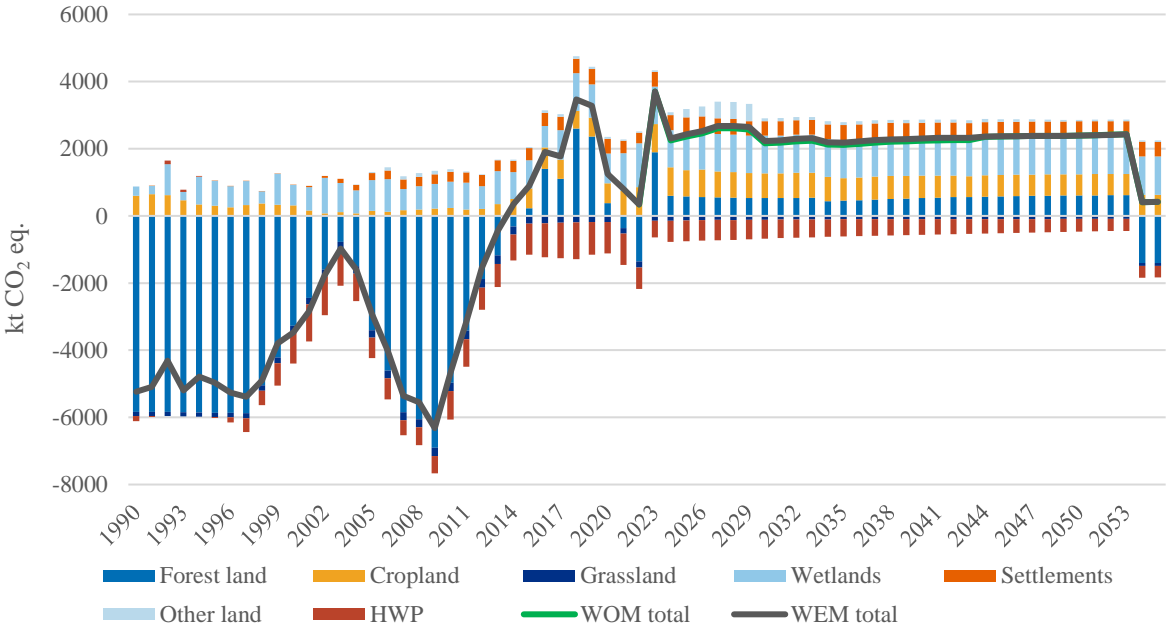


Figure 3.5. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) from the LULUCF sector by land use class according to the WEM and WOM scenarios, kt CO₂ eq.

3.2.6. Waste

3.2.6.1. Methodology

The waste sector WEM scenario GHG projections have been calculated for the period of 2023–2055. The reference year 2022 used in the projections is consistent with Estonia’s 2024 GHG inventory submission to the UNFCCC⁵². The WEM scenario evaluates future GHG emission trends under the current policies and measures.

GHG emissions emitted from the Waste sector include CO₂, CH₄ and N₂O. CO₂ is emitted from the Waste incineration category. The main share of CH₄ from the Waste sector comes from Solid waste disposal on land. CH₄ and N₂O are emitted from Wastewater treatment and discharge, Biological treatment and Waste incineration.

CH₄ emission projections in the Solid waste disposal on land (SWD) subcategory are done using the 2006 IPCC Waste Model, which has been developed by the IPCC for estimating CH₄ emissions from solid waste disposal sites, for projections, additional sheets have been

interlinked with the existing Waste model template sheets which are easy to adjust to reflect the country specific needs. Also, it is possible to interlink cells making the calculations easy. It is difficult to point out the weakness of the model as the calculations' difficulties depend on the adjustments and activity data. In the IPCC 2006 Waste Model, synergies of waste decomposition over time period are taken into account in the calculation. There are no overlaps, because the input data is clearly divided to different waste groups.

The municipal solid waste (MSW) generation projections consider population projection (by Statistics Estonia) and the long-term real GDP growth rate (by the Ministry of Finance). Also, according to the NWP 2023–2028⁴⁹, from 2030 the quantity of municipal solid waste deposited in a landfill shall not exceed 10% by weight of the total quantity of municipal solid waste generated in the same year, and no more than 20% of the landfilled MSW can be biowaste. Additionally, for the separately collected municipal waste a recycling rate of 55% by 2025, 60% by 2030, and 65% by 2035 as mentioned in the NWP 2023–2028 is applied.

Mixed Municipal Solid Waste Composition Study carried out in 2020⁶¹ is used for a MSW composition projection.

Projections in the subcategory Biological treatment of solid waste are based on the long-term real GDP growth rate projections by the Ministry of Finance applied to the previous year's biologically treated solid waste amount. To this projected amount, an addition is done from the amount of biological waste that will be separated from mixed municipal solid waste and will not go to landfilling, and a subtraction due to the demand of energy neutrality of wastewater treatment plants with a capacity of 10 000 population equivalent or more by 2040 in the updated Urban Wastewater Treatment Directive⁵¹ that results in all the mentioned treatment plants sending their sludge to the anaerobic digestion and no longer to composting. Additionally, a subtraction in the size of known and planned biological waste input of a new biogas production plant that opened in 2023 was done.

Only a small amount of waste gets incinerated without energy recovery. Projections in the subcategory Waste incineration and Open burning are done using the expert judgment that open burning and incineration will finish by 2030. Open burning is calculated as a yearly decreasing percentage of the amount of MSW generated. MSW generation is in accordance with the subsector Solid waste disposal on land. Activity data about generated MSW is projected under the SWD subcategory.

Projections of GHG emissions in Wastewater treatment and discharge subcategory are based on the population projections (by Statistics Estonia) and the objectives set for the coverage of centralised wastewater system by the MoC as well as the foreseen changes in the different wastewater treatment systems covering both high- and low-density settlements. GHG emissions from Industrial wastewater are based on the plans of the companies and the resulting change in the industrial wastewater production.

⁶¹ Stockholm Environment Institute Tallinn Center SA. (2020). A research of the composition and amounts of mixed municipal waste, separately collected paper and packaging waste, and electronic scrap. (In Estonian) [www] <https://www.sei.org/wp-content/uploads/2020/10/sortimisuuringu-lopparuanne.pdf> (09.12.2024)

3.2.6.2. GHG emissions projections

According to the WEM scenario, the total emissions from the Waste sector will decrease by 45% between 2022 and 2055, from 314.03 kt CO₂ eq. to 173.1 CO₂ eq., accordingly (see [Figure 3.6](#)).

The sub-category of Biological treatment of solid waste is the only sub-sector where emissions are projected to increase: from 30.3 kt CO₂ eq. in 2022 to 39.1 kt CO₂ eq. in 2055 (29%). The increase is caused by less biodegradable waste being deposited in solid waste disposal sites and more being sent to biological treatment as well as the opening of a new biogas production plant with waste input. It is important to note that the base year of the projections was taken from the national GHG inventory submission of 2024 where anaerobic digestion category was not included as the emissions from Biological treatment category were well below 0.05% of the total national GHG emissions. Although the emissions from this category are projected to remain a small fraction of the national emissions until 2055, the category was included in the projections as the foreseen increase in biogas production in the country has a significant effect on the emissions from Biological treatment of solid waste as well as the total emissions from Waste sector.

In other Waste sector categories, a decrease in emissions is foreseen. In the category of Solid waste disposal, a decrease of 73% is foreseen: from 190.8 kt CO₂ eq. in 2022 to 52.3 kt CO₂ eq. in 2055, the main reason for the change being decrease in total waste generation as well as decrease in waste deposited in solid waste disposal sites. For Waste Incineration and Open burning, a 100% decrease by 2030 is projected: from 0.54 kt CO₂ eq. in 2022 to 0 kt CO₂ eq. in 2030 according to an expert judgment regarding burning of waste without energy recovery stopping in Estonia by that time. For Wastewater treatment, a 12% decrease of emissions is foreseen: from 92.4 kt CO₂ eq. in 2022 to 81.7 kt CO₂ eq. in 2055, the main reason for the change being expansion of the sewage network and upgrading of the wastewater treatment systems in low-density settlements.

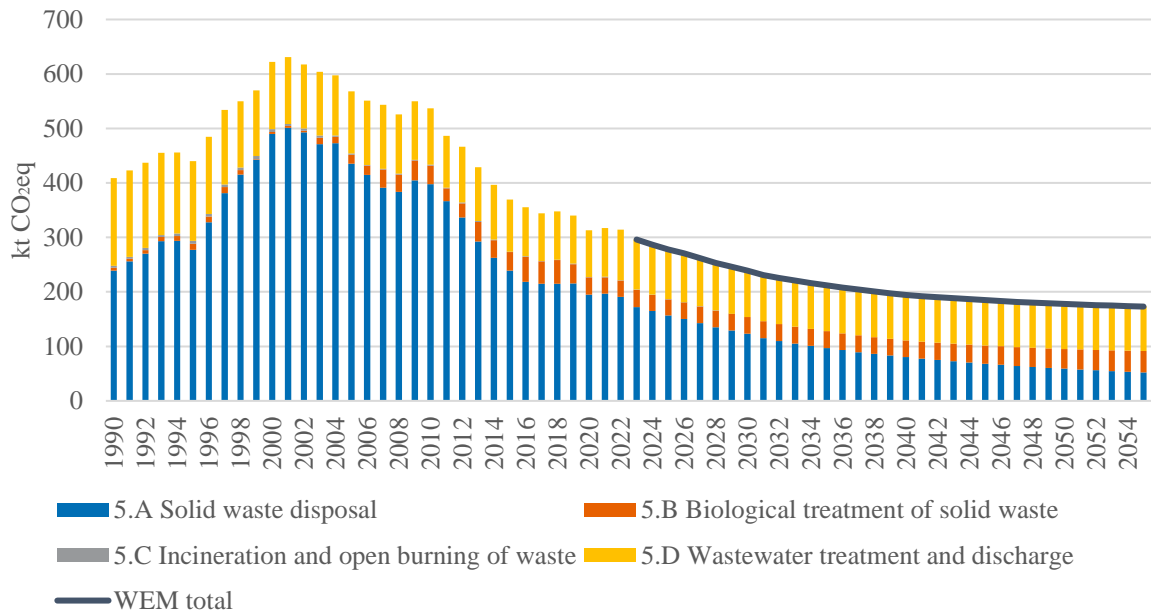


Figure 3.6. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) from the Waste sector according to the WEM scenario, kt CO₂ eq.

3.3. Total projected GHG emissions of Estonia

Estonia’s total projected GHG emissions and historical inventory information using AR5 GWP are presented in Figure 3.7. The GHG emission reduction compared in 2055 compared to base year 2022 is included in Table 3.1.

Table 3.1. GHG reduction in WEM and WOM scenarios in 2055 compared to 2022, (using AR5 GWPs)

	Scenario	Reduction in 2055 compared to 2022, kt CO ₂ eq.	Reduction in 2055 compared to 2022, %
Without	WOM	796.27	-5.71%
LULUCF	WEM	9961.47	-71.40%
With	WOM	716.13	-5.01%
LULUCF	WEM	9881.73	-69.15%

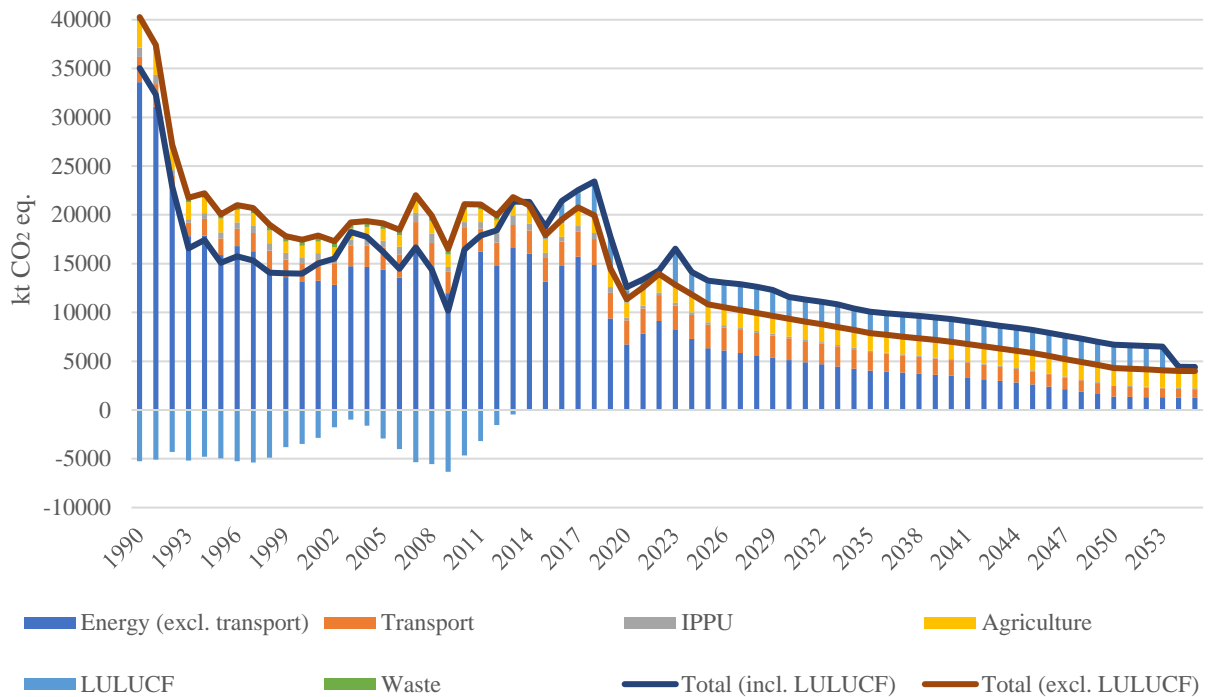


Figure 3.7. Historical GHG emissions (1990–2022) (NIR, 2024) and projected emissions (2023–2055) for the WEM scenario, kt CO₂ eq. (using AR5 GWP)

Estonia’s greenhouse gas emissions are expected to decrease by around 87.42% in the WEM scenario with LULUCF and GHG emissions without LULUCF are expected to decrease by around 90.1% by 2055 compared to the base year of 1990.

While the Energy sector’s subcategory Energy industries dominated total emissions in 1990, its emissions decreased sharply in the beginning of the time series and fluctuate but are projected to continue on a decreasing pathway, reaching a reduction of 96.29% in WEM by 2055 compared to 1990.

Emissions from the Transport sector are driven by the Road transport category, as its share of the total transport sector was approximately 89.7% in 2022. Therefore, it will also be the biggest driver for the decrease of GHG emissions in the road transport sector due to the uptake of electric vehicles. The total decrease of emissions by 2055 compared to 1990 is projected to be 65.36% in the WEM scenario.

Historically, the IPPU sector emissions were driven by the Mineral industries subcategory, however the cement industry ceased burning clinker in wet process kilns and does not foresee future production. The overall emissions from the IPPU sector are projected to decrease by 91.3% from 1990 until 2055 in the WEM scenario. The main decrease after 2020 comes from the product uses as substitutes for ODS (F-gases).

Agriculture emissions are projected to decrease by 41.43% compared to 1990 in the 2055 WEM scenario. Estonia’s agriculture sector is driven by the Enteric Fermentation and Agricultural soils subcategories that are an important food source.

In 1990, the LULUCF sector functioned as a GHG sink with net emissions amounting to -5235.3 kt CO₂ eq. However, in 2023–2055 the LULUCF sector will act as net source, emitting 419.02 kt CO₂ eq. in 2055, according to the WEM scenario. The fluctuations in projected emissions are primarily attributed to changes in forest growing stock and, to a lesser extent, the impact of planned infrastructure projects. Projected changes in forest growing stock depend on the age distribution of forests, management practices and changes in the area of forest land.

According to the WEM scenario, the total emissions from the Waste sector will decrease by 57.26% between 1990 and 2055, from 404.97 kt CO₂ eq. to 173.07 CO₂ eq., accordingly. The emission decrease in the Waste sector until 2055 is mainly related to the increase of reusing and recycling waste materials and the decreasing amount of biodegradable waste deposited in landfills.

3.4. Sensitivity analysis

For the GHG projection compilation, trajectories for parameters for reporting on national GHG projections in 2025 were provided by the European Commission (EC) for all the EU Member States. These include harmonised values to be considered for the 2025 national GHG projections on the international oil, gas and coal import prices, the EU ETS carbon prices, population and GDP.

For the projection compilation, it was possible to use Estonia's Ministry of Finance's updated long-term real GDP growth rate from September 2023 and population projection by Statistics Estonia, which were considered more up to date. The beforementioned EC parameters are used for the IPPU and Waste sectors' sensitivity analysis to validate national data used in the projections. Sensitivity analysis is also conducted for the Transport and LULUCF sectors, on these see more details below.

3.4.1. Transport

Sensitivity analysis for the Transport sector is based on different scenarios of the uptake of electric passenger cars, as they have the highest GHG impact on the sector. Although Regulation (EC) No 2019/631 will have the largest impact on consumer choice for new vehicles in the future, it does not guarantee currently that all vehicles are running on alternative fuels or energy sources by 2055. The baseline composition of the vehicle fleet before 2035 may have a bigger impact on 2055. By the end of 2022, there were around 4.5 thousand electric passenger cars in Estonia.

The SEN analysis considers the GHG impact of different uptake of electric passenger cars by 2030 (Figure 3.8):

- WOM scenario – 30 thousand electric passenger cars;
- SEN1 scenario – 40 thousand electric passenger cars;
- SEN2 scenario – 80 thousand electric passenger cars.

The SEN1 scenario projections are similar to the WOM scenario projections with the difference of 1.5% in emissions by 2030. The difference between the WOM and SEN2 scenarios is around 8.0% by 2030. The assumption after 2030 in all the scenarios is that the new vehicle exchange rate in the fleet stays on average the same as in the past, which is around 25 thousand new passenger cars annually.

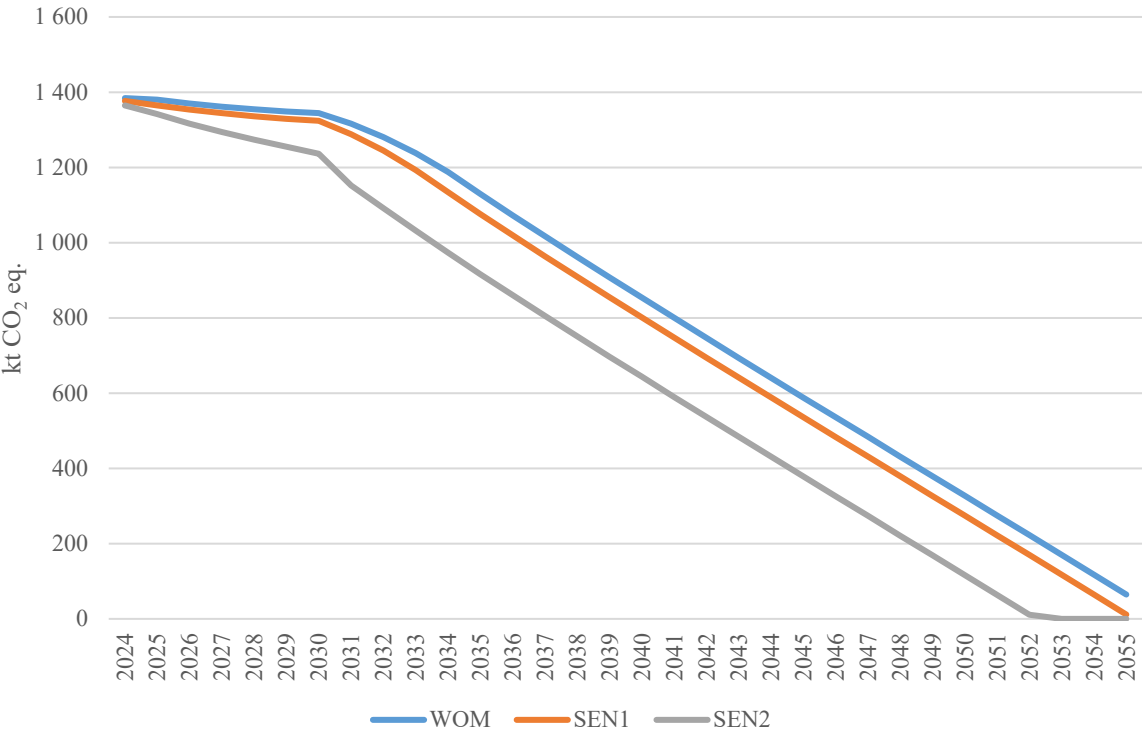


Figure 3.8. Comparison of total GHG emissions of the Transport sector in the WOM, SEN1 and SEN2 scenarios, kt CO₂ eq.

3.4.2. IPPU

Sensitivity analysis for IPPU sector emissions is based on the alternative population and annual real GDP growth rate harmonised values provided by the European Commission (see Table 3.2)

Table 3.2 Harmonised parameters given by the European Commission

Indicator	2025	2030	2035	2040	2045	2050	2055
GDP (growth rate), %	3.18	1.4	1.74	2.03	1.85	1.60	1.35
Population in Estonia, million	1.3759	1.3568	1.3441	1.3423	1.3416	1.34	1.3365

Under the SEN scenario population and GDP growth rate values provided by the EC are used in the calculations of the IPPU categories 2.D Non-energy products from fuels and solvent use (GDP and population) and 2.G Other product manufacture and use (GDP and population) according to the methodology of the WEM scenario.

When comparing GHG emissions between the WEM and SEN scenarios, the emissions are projected to increase by 1.9% in 2045 and by 2.2% in 2055 in the SEN scenario compared to the WEM scenario. The results of the SEN scenario are presented in Figure 3.9.

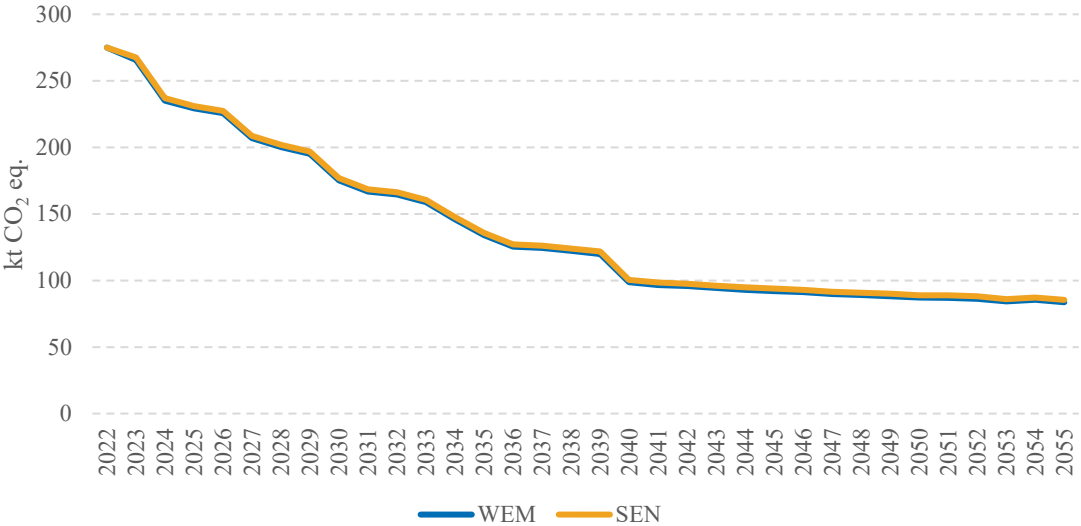


Figure 3.9. Comparison of total GHG emissions of the IPPU sector WEM and SEN scenarios, kt CO₂ eq.

3.4.3. Land-use, land-use change and forestry (LULUCF)

Forest is the prevailing land-use category in Estonia and has the largest influence on the whole LULUCF sector's total carbon balance. The felling scenarios try to predict the future changes in Forest land and HWP carbon stocks under different felling intensities. Sensitivity analysis for LULUCF sector emissions is based on the scenarios, where total felling volume has been projected at 8 million m³ (SEN1), 10 million m³ (SEN2) and 12 million m³ (SEN3) levels. In 2023, the felling volume 12.1 million m³ year⁻¹ has been used for all scenarios as an expert assessment. For other land use categories, no additional SEN analysis is carried out.

Under the SEN1 scenario (total felling volume in 2024–2062 is expected to be 8.0 mln m³ year⁻¹) (Figure 3.10). The LULUCF sector is a CO₂ sink during the first two decades, except in 2023. From 2044 onwards, the Forest land and HWP will no longer compensate for the emissions of other land use categories and LULUCF sector will become a net emitter. The sector is projected to reach maximum removals of -989.63 kt CO₂ eq. in 2030, before declining to 846.61 kt CO₂ eq. by 2055. Emissions and removals from Forest land are predominantly determined by changes in forest growing stock. The total forest growing stock is expected to increase rapidly in the first two decades due to the decreasing felling volume, with a total forest growing stock 7.9% higher in 2043 than in 2023. Net removal in Forest land will rise significantly, reaching -3,060.07 kt CO₂ eq. in 2032, before decreasing slightly to -2,682.00 kt CO₂ eq. in 2042. After that, the growth of the total forest growing stock will slow down due to the changes in the age structure, and C sequestration in Forest land is projected to decrease to -1,192.44 kt CO₂ eq. by 2055. Net removals in HWP are expected to decrease significantly due to the lower felling volumes, from -641.58 kt CO₂ in the base year to -126.64 kt CO₂ in 2055.

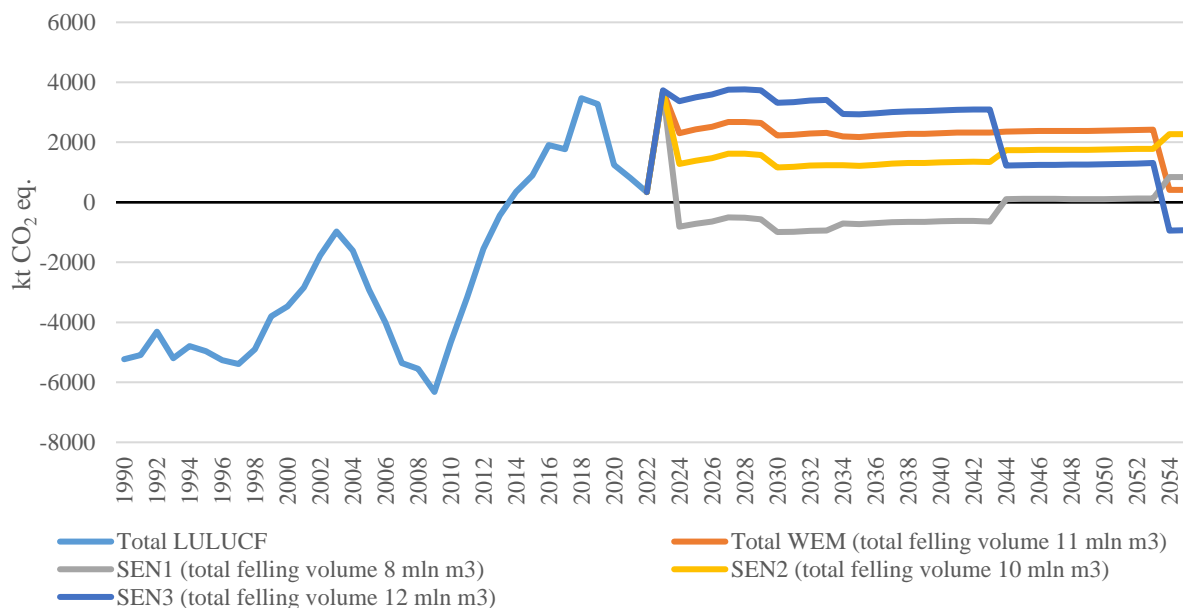


Figure 3.10. Comparison of total GHG emissions of the LULUCF sector SEN1 (total felling volume 8 million m³), SEN2 (total felling volume 10 million m³), SEN3 (total felling volume 12 million m³) and WEM (total felling volume 11 million m³) scenarios, kt CO₂ eq.

According to the SEN2 scenario (total felling volume in 2024–2062 is expected to be 10 mln m³ year⁻¹). The LULUCF sector is a CO₂ source throughout the considered period. Forest land will sequester carbon (except in 2023) until 2053 mainly in the mineral soil and dead wood pools, while the total forest growing stock remains quite stable. From 2054, the total forest growing stock will decrease by 1.3% compared to the 2023 and Forest land will become a net source, emitting 379.43 kt CO₂ eq. by 2055. HWP net removal will decrease compared to the base year, reaching -271.46 kt CO₂ in 2055. Net emissions in the LULUCF sector are projected to increase from 339.29 kt CO₂ eq. in the 2022 to 2,273.66 kt CO₂ eq. in 2055.

Under the SEN3 scenario the total felling volume in 2024–2042 is expected to be 12.0 mln m³ year⁻¹, and then decline to 10.3 mln m³ year⁻¹ in 2043–2052 and to 8.4 mln m³ year⁻¹ in 2053–2062 due to the diminishing area of mature forest stands available for wood supply. During the period of 2022–2053, the LULUCF sector remains a GHG source. Forest land is a net GHG emitter until 2043. Projected emissions will reach their highest level in the first decade (averaging 1,782.89 kt CO₂ eq.) before declining, ultimately reaching -2,683.37 kt CO₂ eq. in 2055. Net removals from Forest land are projected to increase significantly from 2054 because the age structure of forests is favoring greater increment and the felling volumes decrease. It is causing the LULUCF sector to become a carbon sink.

HWP net removal under the SEN3 scenario will increase the most in the first decade (averaging -701.07 kt CO₂ eq.) as increased felling volume allows for more wood products to be produced, and then decline to -416.27 kt CO₂ eq. by 2055 since the felling volume decreases and the decomposition of HWP begins to have a greater impact. The projected overall emissions from the LULUCF sector under the SEN3 scenario will rise in the first decade, peaking at 3,765.18 kt CO₂ eq. in 2028, and then decline to 1,306.75 kt CO₂ eq. in 2053. After that, the LULUCF sector will sequester carbon, reaching up to -933.96 kt CO₂ eq. in 2055.

3.4.4. Waste

Sensitivity analysis for Waste sector emissions is based on the population and annual real GDP growth rate harmonized values provided by the European Commission (see [Table 3.2](#)). All categories in the Waste sector are either affected by the change of population projections, fluctuations in GDP, or both.

The SEN scenario projections are quite similar to the WEM scenario projections. For the year 2040, they project 0.70% lower emissions, while for the year 2055, the SEN scenario projections are slightly less optimistic and project 0.46% higher emissions than for the WEM scenario.

On [Figure 3.11](#) the comparison of the two scenarios in regard to the projected total emissions in the Waste sector can be seen.

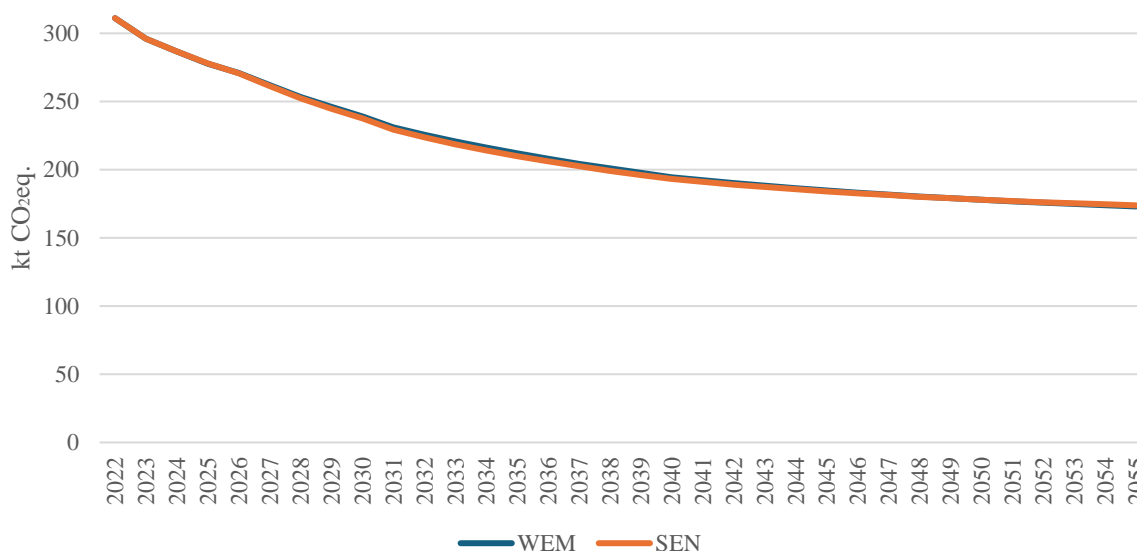


Figure 3.11. Comparison of total GHG emissions of the Waste sector WEM and SEN scenarios, kt CO₂ eq.

3.5. Changes with respect to the 2024 submission

Estonia has not presented for the 2025 submission ‘With Additional Measures’ (WAM) scenario as during the projection preparation period the discussions on the Climate Resilient Economy Act bill, where additional measures are proposed, were ongoing and therefore the WAM scenario was not prepared as not to prejudge the Climate Resilient Economy Act adoption process.

3.5.1. Energy

The comparison of CO₂ eq. emissions with respect to the 2024 submission is presented in [Table 3.3](#) for WEM scenario. The changes in Energy industries category have several reasons. Firstly, electricity generation emissions are now based on an updated input from the Ministry of Climate for electricity generation, incorporating new electricity production inputs. In the previous

submission, the electricity generation was based on the Balmorel model. These updates reflect a changed economic situation, the impact of the 2022 energy crisis, and a reassessment of the impact of measures. Secondly, the projections in the heat production are based on updated analysis of past fuel consumption trends of the sector to reflect the future and also a reassessment of the impact assessment of measures. Thirdly, the input about shale oil industry has also been updated by the industry.

The changes in Manufacturing industries and construction sector and Other sectors occur because the estimates of reconstruction volumes (in m2) were revised for the WEM scenario and the emissions in these sectors have been updated taking into account the latest historical activity data from 2024 NIR. Additionally, a greater decline is now projected for the manufacturing industry because of the low base year, and since 2024 NIR submission off-road vehicles from 1.A.2.g (also from 1.A.4.a and 1.A.4.c) are reported under 1.A.3.e Other transportation.

Fugitive emissions have been updated taking into account the latest historical activity data from 2024 NIR.

Table 3.3. Comparison of 2025 and 2024 WEM scenario Energy sector (excluding transportation) projections, kt CO₂ eq.

Submission	Energy WEM	2025	2030	2035	2040	2045	2050
2025	Energy industries	5600.81	4387.08	3297.53	2783.11	1890.04	612.71
2024		5853.88	5256.01	4781.56	3683.76	1752.81	293.83
2025	Manufacturing industries and construction	259.21	282.16	310.76	339.94	369.70	398.93
2024		432.88	435.27	448.91	464.24	480.97	496.70
2025	Other sectors	459.65	429.70	401.75	371.15	360.24	347.55
2024		609.86	576.94	546.32	513.02	501.26	487.74
2025	Fugitive emissions	21.50	21.50	21.50	21.50	21.50	21.50
2024		22.03	22.03	22.03	22.03	22.03	22.03
2025	Total, kt CO ₂ eq.	6341.17	5120.44	4031.54	3515.71	2641.48	1380.69
2024		6918.65	6290.25	5798.82	4683.04	2757.07	1300.30

3.5.2. Transport

Comparison of Transport sector CO₂ eq. emissions with respect to the 2024 submission in the WEM scenario is presented in Table 3.4. The differences in the submissions occur due to the updated parameter input given by the Ministry of Climate and the Transport Administration (e.g mileage by vehicle type). In addition, the impact assessment of measures has been reassessed, and updates have been made to reflect revised activity data. The differences in the latest projections are influenced by a change in the base year, which affects mileage calculations, recalculations of transport sector measures and mileage estimates, and the addition

of new measures in the WEM scenario (e.g. motor vehicle annual and registration tax, new tram lines).

In the previous submission, off-road transport was accounted in the category where the vehicles were used (categories 1.A.2.g, 1.A.4.a and 1.A.4.c). However, since 2024 NIR off-road transport is reported as a separate category (1.A.3.e) and the change is reflected also in the projections.

Table 3.4. Comparison of 2025 and 2024 WEM scenario Transport sector projections, kt CO₂ eq.

Submissions	Transport WEM	2025	2030	2035	2040	2045	2050
2025	Domestic aviation	4.96	5.26	5.59	5.93	6.30	6.68
2024		5.78	6.06	6.35	6.66	6.98	7.32
2025	Road transportation	2159.42	2005.68	1692.97	1378.74	1113.95	859.67
2024		2150.99	2065.88	1839.81	1528.75	1247.74	968.77
2025	Railways	48.85	7.33	7.33	7.33	7.33	7.33
2024		45.18	6.78	6.78	6.78	6.78	6.78
2025	Domestic navigation	17.96	9.83	9.83	9.83	9.83	9.83
2024		18.65	10.51	10.51	10.51	10.51	10.51
2025	Other transportation	189.81	189.81	189.81	189.81	189.81	189.81
2024		NO	NO	NO	NO	NO	NO
2025	Total, kt CO ₂ eq.	2420.99	2217.91	1905.52	1591.63	1327.21	1073.32
2024		2220.60	2089.23	1863.45	1552.69	1272.00	993.38

3.5.3. IPPU

Comparison of IPPU sector CO₂ eq. emissions with respect to the 2025 submission in the WEM scenario is presented in [Table 3.5](#).

In the 2024 submission Estonia did not update the IPPU sector projections and therefore the previous projections are the ones from the 2023 submission.

The WEM scenario in 2025 and in 2023 submission differs mainly in decreased emissions from the categories 2.A and 2.F.

Emissions from the Mineral industry decreased in the 2025 submission compared to the 2023 submission. The main cause is the decrease in the production of lime considering the projection's base year 2022 and projections input from the biggest lime production company.

Projected emissions from the Metal industry are at a similar level in 2023 and 2025 submissions. The Metal industry's projected emissions are based on 2018–2022 years emissions, which have been quite stable during these years.

Emissions from subsector 2.D Non-energy products from fuels and solvent use are projected to increase in the 2025 submission compared to 2023, which is caused by increased consumption of solvent based chemicals in 2021 and 2022 therefore overall average emissions in 2018–2022 were higher than average emissions in previous projections. Previous years' emissions trends are taken into account in the projections.

Difference in projections of emissions in the 2023 and 2025 submissions from 2.F sector is based mainly on the impact from the the new F-gas regulation (which entered into force in 2024) taking into account the stricter bans coming into force in certain years. Based on these bans the F-gas emissions are decreasing faster compared to previous projections. Subsector 2.F.2 Foam blowing agents is based on previous emission trends in 2018–2022 and the ban stipulating that from 2033 onwards the foams have to be without HFC-s. Projection of emissions from 2.F.3 Fire protection is based on the new F-gas regulation and takes into consideration the ban stipulating that from 2025 onwards the equipment has to be without HFC-s, therefore emissions are decreasing faster than in previous projections. Differences in the projection of emissions from subsector 2.F.4 Aerosols are mainly based on the change in the methodology where trend of medical aerosol emissions in 2020–2022 are used and not the change in the population size and therefore the projections are higher compared to previous projections. Base year emissions in the 2.F category also affected the projections.

In the category 2.G Other product manufacture and use the projected emissions are larger in the 2025 submission than in 2023 submission. The methodology has remained the same however the base year GHG inventory has changed as well as the plans on installing new equipment by the electrical network operators in Estonia. Consumption of N₂O in aerosols was calculated with the projection of population size combined with emission trends in 2018–2022. As the population is decreasing then the emissions are also decreasing.

Table 3.5. Comparison of 2025 and 2023 WEM scenario IPPU sector projections, kt CO₂ eq.

Submissions	WEM	2025	2030	2035	2040	2045	2050
2025	2.A Mineral industry	32.56	32.64	32.64	32.64	32.64	32.64
2023		69.04	69.04	69.04	69.04	69.04	69.04
2025	2.B Chemical industry	NO	NO	NO	NO	NO	NO
2023		NO	NO	NO	NO	NO	NO
2025	2.C Metal industry	2.92	2.93	2.93	2.93	2.93	2.93
2023		3.24	3.24	3.24	3.24	3.24	3.24
2025	2.D Non-energy products from fuels and solvent use	34.39	34.22	33.99	33.84	33.76	33.68
2023		26.05	25.85	25.73	25.28	25.15	25.27
2025	2.F Product uses as substitutes for ODS	152.18	98.07	57.25	22.38	16.80	12.53
2023		147.84	109.18	69.37	57.65	54.74	53.53
2025	2.G Other product manufacture and use	7.26	7.38	7.19	6.91	5.98	5.39
2023		4.37	4.81	5.19	5.34	5.37	5.23
2025	Total CO ₂ eq.	229.30	175.24	134.00	98.69	92.11	87.16
2023		250.55	212.13	172.57	160.55	157.55	156.31

3.5.4. Agriculture

The main reason for the fall in projected WEM emissions in the 2025 submission compared to the 2024 submission (Table 3.6) is mostly explained by the anticipation of more pessimistic agricultural output. The 2024 submission did not include WOM scenario projections in Agriculture sector.

The projected numbers of some animals have decreased compared to the previous submission. For example: cattle, sheep, goat and rabbit populations are projected to increase, but swine, poultry and horse populations are projected to decrease.

In Enteric fermentation subsector, the emissions by the year 2055 are projected to increase in the 2025 submission compared to the 2024 submission. This is mostly due to higher cattle population projections and the increase in milk yield per cow. In Manure management subsector, the emissions are projected to decrease in the 2025 submission compared to the 2024 submission. This is mainly caused by the higher number of biogas production plants projected to be built during the projected period than in the previous submission, and the higher percentage of the distribution of manure from grazing from mature female cattle. Both manure sent to biogas digesters and manure from grazing have lower EF than for example liquid manure – this causes methane emissions to decrease. In the Agricultural soils subsector, the emissions are projected to decrease in the 2025 projections compared to the previous submission because projected amounts of both inorganic and organic (except for fertilizer from waste-based co-digestates) fertilizers are projected to decrease compared to the previous submission. In

addition, the crop production is also projected to decrease compared to the previous submission. In Liming subsector, the emissions are projected to decrease in the 2025 projections compared to the previous submission because the projected amounts of lime fertilizers are projected to decrease. In Urea application subsector, projected emissions are similar to the previous projections, a small increase is projected in the 2025 projections, which is associated with the increased urea use.

Table 3.6. Comparison of 2025 and 2024 WEM scenario Agriculture sector projections, kt CO₂ eq.

Submissions	Agriculture WEM	2025	2030	2035	2040	2045	2050
2025	Enteric fermentation	637.23	664.49	679.06	678.82	678.82	678.82
2024		629.60	644.02	655.05	654.79	654.79	654.79
2025	Manure management	228.27	220.95	225.09	224.87	224.71	224.50
2024		241.54	231.31	234.41	234.44	234.56	234.67
2025	Agricultural soils	658.68	666.20	662.27	663.33	659.25	659.30
2024		726.53	745.41	744.83	746.74	741.80	741.95
2025	Liming	32.40	32.77	32.48	32.48	32.48	32.48
2024		33.85	34.28	34.29	34.29	34.29	34.29
2025	Urea application	0.28	0.25	0.25	0.25	0.25	0.26
2024		0.13	0.13	0.13	0.13	0.13	0.13
2025	Total, kt CO ₂ eq.	1556.85	1584.66	1599.15	1599.76	1595.51	1595.36
2024		1631.65	1655.15	1668.71	1670.40	1665.57	1665.83

3.5.5. Land-use, land-use change and forestry (LULUCF)

Differences in projected emissions between 2025 and 2024 submissions are presented in [Table 3.7](#). Updated activity data (areas, growing stocks, etc.) and parameters are applied to all land use categories.

The main differences in projections have occurred in the Forest land and HWP categories mainly due to a new felling scenario used for calculations (NFI)⁶². In addition, C stock changes in dead wood for Forest land remaining forest land have changed compared to the previous submission because of methodological changes in the GHG inventory. More detailed information about the recalculation of historical time-series, on which the projections are based, can be found in the 2024 NIR. Due to the large forest land area, even moderate changes in activity data significantly impact the projected values. Projected carbon sequestration in HWP has also decreased because, unlike last year, the production of wood-based panels was projected as zero in the 2025 submission.

⁶² Keskonnoportaali. National Forest Inventory 2023. [www] <https://tableau.envir.ee/views/SMI/1Maakategooriad?%3Aembed=y&%3Aiid=1&%3AisGuestRedirectFromVizportal=y> (06.12.2024)

In the current submission, land use and land use change areas are generally estimated based on recent trends from the 2018–2022 period. Additionally, the deforestation areas resulting from the establishment of Rail Baltic and military training fields are specified, affecting emissions from the Settlements and Other Land categories. The deforested area for military purposes is smaller than previously projected and is now considered under the Forest land converted to Other land category, rather than under Settlements as in the previous submission.

Projected emissions for the Wetlands category have decreased compared to the 2024 submission because the 2019–2023 average peat extraction amount applied in the calculations is lower than the 2018–2022 average used in the previous submission.

Table 3.7. Comparison of 2025 and 2024 WEM scenario LULUCF sector projections, kt CO₂ eq.

Submission	LULUCF	2025	2030	2035	2040	2045	2050
2025	Forest land	579.85	531.46	451.93	529.46	578.75	609.11
2024		259.98	208.06	7.11	85.61	-346.11	-315.37
2025	Cropland	783.52	732.73	668.32	668.92	638.85	633.08
2024		789.87	736.94	673.40	673.94	637.54	633.58
2025	Grassland	-134.46	-111.86	-101.06	-95.34	-93.52	-90.30
2024		-146.87	-122.46	-111.24	-105.11	-102.95	-99.36
2025	Wetlands	1108.39	1123.08	1142.53	1142.21	1142.37	1142.37
2024		1450.85	1470.57	1496.92	1496.60	1496.77	1496.77
2025	Settlements	464.10	432.57	440.14	434.40	436.81	432.20
2024		440.14	434.40	436.81	432.20	455.27	436.23
2025	Other land	250.36	89.08	91.73	88.98	84.79	46.49
2024		140.82	99.52	111.30	98.98	104.52	104.52
2025	Harvested wood products	-624.47	-566.48	-512.81	-464.06	-419.92	-379.99
2024		-824.13	-742.74	-668.53	-601.69	-541.61	-487.62
2025	Total, kt CO ₂ eq.	2427.29	2230.59	2180.77	2304.57	2368.12	2392.96
2024		2707.69	2120.14	1986.77	2120.41	1703.42	1768.74

3.5.6. Waste

The comparison of the projections for the different Waste sector categories done in 2023 and 2025 can be seen in the table below (Table 3.8). The projected emissions for Solid waste disposal were higher in the 2025 submission than in the previous submission as they depend on the solid waste generation rate, that was previously connected to ½ GDP growth and in the current projections are connected to the GDP growth directly. Emission projections for the Biological treatment of waste are more optimistic than in the previous submission due to the increased focus on biogas production in the country, which results in more biologically degradable waste being sent to anaerobic digestion instead of composting. The Waste incineration and open burning category has similarly low emissions in both submissions due to the consideration of the expert opinion regarding the burning of waste without energy recovery

in Estonia ending by 2030. In the Wastewater treatment and discharge category, the projections are less optimistic due to the growth plans of the industry being taken into consideration this time, which increase the amount of industrial wastewater produced between 2022 and 2030 by 11%. Additionally, all the categories are affected by the change in GDP and population growth rate projections.

Table 3.8. Comparison of 2025 and 2023 WEM scenario Waste sector projections, kt CO₂ eq.

Submission	Waste WEM	2025	2030	2035	2040	2045	2050
2025	Solid waste disposal on land	156.52	123.26	96.90	80.22	68.13	59.12
2023		142.81	99.56	71.42	52.96	40.19	31.28
2025	Biological treatment of solid waste	29.88	30.83	31.01	30.67	33.51	36.28
2023		49.88	57.60	60.97	64.16	67.55	70.92
2025	Waste incineration and open burning	0.45	NO	NO	NO	NO	NO
2023		0.50	0.00001	0.00001	0.00001	0,00	0,00
2025	Wastewater treatment and discharge	90.90	84.92	84.07	83.63	83.14	82.52
2023		81.22	80.22	79.26	78.45	77.5	76.56
2025	Total, kt CO ₂ eq	277.75	239.01	211.99	194.52	184.78	177.92
2023		274.42	237.38	211.64	195.56	185.24	178.76

Abbreviations

AD –	activity data
AMTEL –	Association of Estonian Car Sales and Service Companies
BAT –	best available technology
CHP –	combined heat and power
EF –	emission factor
ESR –	Effort Sharing Regulation
ETS –	Emissions Trading System
EU –	European Union
eq –	equivalent
F-gas –	fluorinated greenhouse gas
GDP –	gross domestic product
GHC –	gaseous heat carrier
GHG –	greenhouse gas
GWh –	gigawatt hour
GWP –	global warming potential
IPCC –	Intergovernmental Panel on Climate Change
IPPU –	Industrial processes and product use
ITF –	International Transport Forum
kt –	kiloton
kWh –	kilowatt hour
LULUCF –	Land use, land-use change and forestry
MoE –	Ministry of the Environment
MoC –	Ministry of Climate
NFI –	National Forest Inventory
NIR –	National Inventory Report
PaM –	policies and measures
PJ –	petajoule
SHC –	solid heat carrier
TJ –	terajoule
UNFCCC –	United Nations Framework Convention on Climate Change
WAM –	with additional measures
WEM –	existing measures
yr –	year

Documents

AFDP –	Agriculture and fisheries development plan until 2030
APM –	Agriculture Projection Model
CAP –	Common Agricultural Policy
EFDP 2020–	The Estonian Forestry Development Programme until 2020
EFDP 2030 –	Forestry Development Plan until 2030
ENMAK 2030 –	Estonian Energy Sector Development Plan 2030
ERDP –	Estonian rural development plan 2014–2020, extended to 2023/2024
GPCP 2050 –	General Principles of Climate Policy 2050
NECP 2030 –	National Energy and Climate Plan 2030
NWMP –	National Waste Management Plan 2014–2020, extended to 2023
NWP –	National Waste Plan 2023–2028
REKS –	Long-term reconstruction strategy

Greenhouse gases

CH ₄ –	methane
CO ₂ –	carbon dioxide
N ₂ O –	nitrous oxide
HFC –	hydrofluorocarbons
PFC –	perfluorocarbons
SF ₆ –	sulphur hexafluoride
NF ₃ –	nitrogen trifluoride

Atmospheric pollutants

NMVOC –	non-methane volatile organic compound
NH ₃ –	ammonia
NO _x –	nitrogen oxides