REPUBLIC OF SLOVENIA
**MINISTRY OF THE ENVIRONMENT, CLIMATE AND ENERGY**

# First Biennial Transparency Report of the Republic of Slovenia under the Paris Agreement

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Common text in the BTRs of EU Member States.

Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement, Decision 18/CMA.1[1]

[1] CMA2018_03a02E.pdf

# List of abbreviations

| | |
|---|---|
| AGEN-RS | Energy Agency of Slovenia |
| AIS | Agricultural Institute of Slovenia |
| BAT | Best available technique |
| BEV | Battery Electric Vehicles |
| Borzen | Market Operator Activity and Centre for RES/CHP support |
| BR5/NC8 | 5. Biennial report and 8. National Communication |
| BRT | see also ETS2 |
| CAP | Common Agricultural Policy |
| CCU | Carbon Capture and Use |
| CEIA | Comprehensive Environmental Impact Assessment |
| CH4 | Methane |
| CHP | Combined Heat and Power Plant |
| CO2 | Carbon dioxide |
| CORSIA | Carbon Offsetting and Reduction Scheme for International Aviation |
| CF | Cohesion Fund |
| CPS | Comprehensive Transport Strategies |
| DARS | Motorway Company in the Republic of Slovenia, d. d. |
| DM | Demand management |
| DHS | District Heating System |
| DH | District Heat |
| DHCS | District Heating and Cooling System |
| DPN | National Spatial Plan |
| DRSI | Slovenian Infrastructure Agency |
| DUJPP | Public Transport Management Company |
| EARS | Environmental agency of Slovenia |
| EC | European Commission |
| EE | Energy efficiency |
| EED | Energy Efficiency Directive |
| EIA | Environmental Impact Assessment |
| ELES | Combined transmission and distribution system operator |
| ENSVET | Energy advisory network |
| EPC | Energy Performance Contracting |
| ERDF | European Regional Development Fund |
| ESF | European Social Fund |
| ESS | Electricity Storage System |
| ESR (non-ETS) | Effort sharing regulation (also non ETS) |
| EU, EU-27 | European Union |
| EU ETS(1) | Emission trading scheme that started in 2005 |
| Eurostat | European Statistical Office |
| EURO-CORDEX | European branch of the international CORDEX initiative |
| FCEV | Fuel cell electric vehicles |
| FAO | Agriculture Organization of the United Nations |
| F-gases | Fluorinated gases: Hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulfur hexafluoride (SF6) |
| FIS | Forestry Institute of Slovenia |
| GCF | Green Climate Fund |
| GEF | Global Environment Facility |
| GHG | Greenhouse gases |
| GPP | Green Public Procurement |
| GDP | Gross Domestic product |
| HFO | Heavy Fuel Oil |
| HFC | Hydrofluorocarbons |
| HPP | Hydro Power Plant |
| IBRD | International Bank for Reconstruction and Development |
| IDA | International Development Association |
| IJPP | Integrated Public Passenger Transport |
| IPCC | Intergovernmental Panel on Climate Change |
| JRC-IDEES | Joint Research Centre's Integrated Database of the European Energy System |

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| JTF | EU Just Transition Fund |
| LCS | Low Carbon Sources (i.e. synthetic gas, hydrogen) |
| LEK | Local Energy Concepts |
| LFO | Light Fuel Oil |
| LNG | Liquified natural gas |
| LULUCF | Land use, Land use change and forestry |
| LUR+ | Ljubljana Urban Region |
| MaaS | Mobility as a Service |
| MAFF | Ministry of Agriculture, Forestry and Food |
| MC | Ministry of Culture |
| MCRD | Ministry of Cohesion and Regional Development |
| ME | Ministry of Education |
| MECE | Ministry of the Environment, Climate and Energy |
| MF | Ministry of Finance |
| MH | Ministry of Health |
| MHESI | Ministry of Higher Education, Science and Innovation |
| MI | Ministry of Infrastructure |
| MLFSA | Ministry of Labour, Family, Social Affairs and Equal Opportunities |
| METS | Ministry of the Economy, Tourism and Sport |
| MNRSP | Ministry of Natural Resources and Spatial Planning |
| MPA | Ministry for Public Administration |
| MSP | Medium and Small Companies |
| MSP | Ministry of Solidarity-Based Future |
| MZEZ | Ministry of Foreign and European Affairs |
| N2O | Nitrous Oxide |
| NAP | National Access Point |
| NCUP | National Traffic Management Centre |
| NDC | Nationally Determined Contribution |
| NE | Nuclear energy |
| NECP | National Energy and Climate Plan |
| NID | National Inventory Document |
| ODA | Official Development Assistance |
| OECD | Organisation for Economic Co-operation and Development |
| OOF | Other Official Flows |
| OP EKP | Operational Programme for the Implementation of the EU Cohesion Policy |
| PFC | Perfluorocarbons |
| PHEV | Plug-in Hybrid Vehicles |
| PHS | Pumped Hydro Storage |
| PP-EPS | Project Office for the Energy Renovation of Buildings |
| PURES | Rules on efficient use of energy in buildings |
| PV | Solar Photovoltaic System |
| Re-Co | Review and optimise the functioning of existing technical building systems |
| RES | Renewable energy sources |
| RDI | Research, Development and Innovation |
| RRF | Recovery and Resilience Facility |
| RRP | Recovery and Resilience Plan |
| RIS | Rapid improved of supply |
| S5 | Smart Specialisation Strategy |
| SCF | Social Climate Fund |
| SF6 | Sulfur hexafluoride |
| SiMO | Slovenian National Journey Planner |
| SLO kTG | Sustainability indicators for construction in Slovenia |
| SME | Small and Medium Enterprises |
| SORS | Statistical Office of Slovenia |
| SRIP | Strategic Research and Innovation Partnerships |
| SŽ | Slovenian Railways |
| TEŠ | Thermoelectric Power Plant Šoštanj |
| TE-TOL | Thermoelectric and Heating Plant Ljubljana |
| TEN-T | Trans-European Transport Network |
| TET | Thermoelectric Power Plant Trbovlje |

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|---|---|
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNV | Decree on the most suitable alternatives |
| WAM | With additional measures |
| WH | Waste Heat |
| WM | With measures |
| WPP | Wind Power Plant |
| ZEOEE | Electricity Supply Act |
| ZER(O) | Programmes to reduce energy poverty |
| ZeJN | Law on Public Procurement |
| ZINV | Investment Promotion Act |
| ZURE | Act on Energy Efficiency |
| ZSROVE | Act on the Promotion of the Use of Renewable Energy Sources |

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# Executive summary

**National circumstances**

Slovenia is a parliamentary democracy in terms of its political structure. It has been a member of the European Union since 1 May 2004. Slovenia has 212 municipalities, which are the basic units of local self-government.

The Ministry of the Environment, Climate and Energy (MECE) is responsible for the development and implementation of environmental and climate policies and legislation. MECE also coordinates the preparation of climate policy measures in cooperation with other relevant line ministries. The Environmental Agency of the Republic of Slovenia (EARS), an administrative body within MECE, is responsible for compiling and reporting on emission inventories.

As of 2023, Slovenia's population stood at 2,116,972, representing an increase of approximately 7,000 compared to the previous year. The increase is driven by immigration, as natural population growth has remained negative for the seventh consecutive year. Population density is moderate.

Geographically, Slovenia is situated in Central Europe, sharing borders with Austria to the north, Hungary to the east, Croatia to the south, and Italy to the west. The country covers an area of 20,273 km². It is characterised by significant landscape diversity and rich biodiversity. Forests cover the largest portion (58%) of Slovenia's surface area.

In Slovenia, climate change impacts are most clearly visible in atmospheric warming. Between 1950 and 2023, the average annual temperature increased by 2 °C. Precipitation trends are inconsistent, showing strong regional and seasonal variations. Over the same period, the annual volume of precipitation decreased by up to 2% per decade, except in north-eastern Slovenia, where an upward trend was observed.

In 2023, Slovenia's gross domestic product (GDP) reached EUR 63,951 million. By 2022 and 2023, the Slovenian economy had fully recovered from the Covid-19 pandemic. Slovenia's economic development level, measured by GDP per capita in purchasing power standards (PPS), reached 91% of the EU average in 2023. As regards the value-added structure, the largest share is held by industry, with manufacturing activities predominating, followed by trade. In 2023, total imports amounted to EUR 57.1 billion, while total exports reached EUR 54.9 billion. In Slovenia, the employment rate for persons aged 20 to 64 reached 77.5% in 2023, surpassing the EU average of 75.3%. The at-risk-of-poverty rate for employed individuals, meanwhile, stood at 5.8%, also below the EU average of 8.3%.

Energy supply in 2023 was 17% lower than in 2005, with the peak value recorded in 2008. Liquid fuels account for the largest share, followed by nuclear energy, renewable energy sources, solid fuels, and natural gas. Coal remains Slovenia's only domestic fossil fuel source. Renewable energy sources—primarily wood biomass and hydropower—account for 20% of the energy mix. Since 1992, final energy consumption has increased, driven mainly by rising demand in the transport sector and other final energy uses. Transport accounts for 41% of final energy consumption, substantially exceeding that of all other sectors. In 2023, the largest share of electricity was generated from renewable energy sources (40%), followed by nuclear energy (35%) and solid fuels (20%).

In Slovenia, road freight and passenger transport volumes increased steadily until the onset of the economic crisis in 2009. The growth in passenger car transport has been driven by an increase in the number of vehicles—motorisation reached 579 passenger cars per 1,000 inhabitants in 2023—and by a rise in the average number of kilometres travelled. Following a sharp decline in passenger-kilometres (pkm) in public passenger transport, a slight upward trend has been observed in recent years; however, levels have not yet returned to those recorded in 2019, prior to the pandemic. Passenger cars account for 93% of all passenger

transport. Freight transport is shaped by Slovenia's location at the intersection of two trans-European corridors, its export-oriented economy, and the Port of Koper. These three factors have contributed to the strong growth in freight transport, to which foreign carriers have also made a significant contribution. The share of rail freight transport in total inland freight transport has been declining in recent years, as it has been unable to keep pace with the expansion of road freight.

In 2023, just under 11.4 million tonnes of waste were generated in Slovenia—more than in 2021, when 9.4 million tonnes were recorded, but less than in 2022. This decrease is the result of a reduction in the volume of construction waste, which nevertheless still accounted for three quarters of all waste generated. As regards waste management, significant changes took place in the past, resulting in a drastic reduction in the amount of waste disposed of to landfill.

According to the 2015 register-based housing census, Slovenia's housing stock comprised 864,300 dwellings in 2021. The average floor area per dwelling was 83 m² in 2021. Four out of five dwellings were occupied, and of these, one in twelve was rented. The majority of dwellings (60%) were located in single- or two-dwelling buildings.

The number of agricultural holdings in Slovenia is declining. In 2023, there were 50,531 holdings. However, compared to 2020, the number of holdings with 20 hectares or more of utilised agricultural area increased. According to the new methodology in effect since 2023, the average agricultural holding in Slovenia covers 8.8 hectares, of which 5 hectares are permanent grassland and pastures, 3.4 hectares are arable land, and 0.5 hectares are permanent crops.

Slovenia is among the more industrialised countries in Europe. In 2022, the industrial sector accounted for as much as 25.7% of Slovenia's GDP. Manufacturing activities represented 22.6% of total value added in 2022, compared to 25.1% in 1995.

**Policies and measures**

The overarching policy document in the field of climate policy is the Resolution on Slovenia's Long-Term Climate Strategy until 2050 (ReDPS50), adopted by the National Assembly in March 2021. The overarching national objective is to achieve climate neutrality by 2050. The main implementation document is the Integrated National Energy and Climate Plan (NECP), updated and adopted in 2024, in accordance with the regulation on the governance of the Energy Union (Regulation (EU) 2018/1999). Both overarching documents are underpinned by sectoral strategic documents.

In Slovenia, cross-sectoral climate change mitigation measures include a wide range of fiscal, legislative, and economic mechanisms affecting various sectors, such as energy, transport, industry, agriculture, the public sector, and households. These measures play a key role in achieving greenhouse gas (GHG) emission reduction targets and in facilitating the transition to a climate-neutral society.

One of the most important cross-sectoral measures is the EU Emissions Trading System (EU ETS), which applies to sectors such as electricity generation, industrial processes, and energy use in industry. The aim of this system is to enable cost-effective emission reductions and to incentivise innovation in the transition to low-carbon technologies. As of 2027, the system will be extended to cover energy use in transport and buildings, as well as the remaining energy use in industry. Key fiscal measures include environmental levies and energy taxes aimed at reducing emissions and promoting the competitiveness of more environmentally friendly energy sources. Changes to environmental levies are geared towards the internalisation of the external costs of $CO_2$ emissions and the gradual reduction of incentives for the use of fossil fuels. The government also implements green public procurement which encourages the use of environmentally friendly products and services in the public sector. The purpose of this measure is to reduce the environmental footprint and improve the energy efficiency of public buildings and infrastructure. As part of the Just Transition Plan, Slovenia has developed

various financial instruments to support businesses in green transition, with funding directed towards research, innovation and competitiveness in climate-neutral technologies. In addition, a grant scheme has been introduced to support projects for the energy renovation of buildings and multi-dwelling buildings. Through measures such as the management of fossil fuel subsidies, green budgeting policy, and the promotion of sustainable mobility, Slovenia is strengthening systemic changes to support the achievement of its long-term climate objectives. This set of measures also places strong emphasis on education, training, awareness-raising, information dissemination, and promotion, as well as improvements in spatial planning to support the implementation of energy efficiency (EE) and renewable energy (RE) measures. These, in turn, form a crucial basis for the effective deployment of other measures.

In the energy supply sector, Slovenia is implementing ambitious measures to support decarbonisation and increase the share of renewable energy sources. A key objective is the gradual phase-out of coal for electricity production by 2033, to be replaced by renewable sources and low-carbon technologies. Slovenia is promoting the development of smart grids to enable more efficient integration of renewables and is increasing investments in energy storage systems and flexible electricity management solutions.

In the industrial sector, energy efficiency is being enhanced through process electrification, the use of natural gas as a transitional fuel, and improved material efficiency. Measures include incentives for the deployment of low-carbon technologies, the replacement of outdated systems, and greater use of waste heat. Industrial enterprises participate in EU ETS, which provides further incentives for innovation and emission reductions.

In the buildings sector, the objective is to enhance energy efficiency through large-scale energy renovation programmes, including improved insulation, more efficient heating systems, and the deployment of heat pumps. Slovenia provides subsidies to support the transition to renewable energy sources and is introducing stricter standards for new buildings.

In the transport sector, the focus is on the coordinated development of sustainable mobility, aiming to shift future transport increasingly towards high-quality public passenger transport and active mobility, such as cycling and walking. This transition will require improved integrated transport planning at all levels of governance and the effective implementation of these plans. Nevertheless, a substantial share of journeys will continue to be made by car. Measures will therefore be implemented to support the electrification of the vehicle fleet and the development of alternative fuels. These will be directed at improving charging and refuelling infrastructure for alternative fuel vehicles, providing financial incentives for the purchase of electric and other low-emission vehicles, and the rolling out fast-charging infrastructure along key transport corridors. Measures place a strong emphasis on the improvement of rail infrastructure, enabling further development of both freight and passenger transport by rail. Railway lines will be modernised, faster trains will be introduced, and integration with other forms of public transport will be enhanced. Additional set of measures will be implemented to reduce the attractiveness of private car use. These include urban access charges, parking management, speed restrictions, and incentives for carpooling or giving up a second car.

In the industrial processes sector, measures focus on reducing emissions of fluorinated GHGes (F-gases), in line with the implementation of EU legislation.

In the agriculture sector, Slovenia is implementing measures to reduce GHG emissions through improved livestock efficiency, optimised fertiliser use, and the promotion of organic farming. The share of agricultural land under organic production continues to grow, with permanent grassland representing the largest share. The sector is focusing on reducing methane and nitrous oxide emissions, particularly through smart fertilisation practices and the transition to low-emission livestock systems.

In the LULUCF sector, Slovenia is striving to enhance natural carbon sinks, promote sustainable forest management, and restore degraded ecosystems. Key measures include

adjusting tree species composition and improving forest resilience to climate change. Slovenia is pursuing sustainable forest management, following the guidelines of the National Forest Programme, which sets out measures for the multifunctional use of forests and increased activity in privately owned forests. A significant share of actions is directed towards increasing the use of wood in construction, thereby enabling long-term carbon storage. Slovenia supports investment in wood processing, which contributes to the reduction of net emissions At the same time, restoration measures are being implemented for natural ecosystems such as wetlands, peatlands, and grasslands, as these play an important role in carbon sequestration.

In the waste sector, key measures focus on reducing waste generation, increasing recycling rates, and minimising the landfilling of biodegradable waste. Slovenia is implementing actions aimed at waste prevention, promoting reuse, and improving separate waste collection systems. Measures have also been adopted for the capture of landfill gas, which is used for energy production and contributes to the reduction of methane emissions.

**GHG emissions inventory**

Carbon dioxide ($CO_2$) accounts for by far the largest share of total GHG emissions, representing 81.3% in 2022. This high share is primarily attributable to fuel combustion and industrial processes. Compared to 1986, $CO_2$ emissions were 24.2% lower in 2022. Methane ($CH_4$) accounted for 12.2% of total emissions and was 34.8% lower than in 1986, while nitrous oxide ($N_2O$) represented 4.5% of emissions and was 3.2% lower than in 1986. Fluorinated gases (F-gases) contributed 2% to total GHG emissions, with trends differing across individual gases.

The energy sector — which includes both energy supply and energy use — remains the largest source of emissions. In 2022, it accounted for 79.3% of total GHG emissions. Emissions from this sector were 24.7% lower than in 1986; however, transport emissions increased by 182.5% over the same period. The manufacturing industries and construction sector recorded a significant reduction in emissions (–61.1%), primarily due to economic downturns and mitigation measures. Agriculture, which accounts for 10.9% of total emissions, remains the main source of methane and nitrous oxide. However, emissions from this sector decreased by 16.3%. Emissions from the waste sector were 45.5% lower than in 1986. In the LULUCF sector, where Slovenian forests have been affected by natural disasters in recent years, net $CO_2$ removals amounted to –173 kt $CO_2$ eq. in 2022 — significantly below the levels recorded in previous years.

**Emissions and removals projections**

Emissions projections were developed in 2023 and 2024 as part of the revision of NECP. The projections extend to 2050 in five-year intervals. For the purposes of this report, projections are presented up to 2040 and are compared against the latest available GHG inventory data. The base year for the projections and model calibration is 2020; however, some models were additionally calibrated for 2019 and 2021.

Under the With Measures scenario, emissions are projected to decrease to 16,479 kt $CO_2$ eq. by 2025, and to 16,325 kt $CO_2$ eq. by 2030. By 2040, emissions are projected to decline further, reaching a level 31% below 2030 emissions. Under the With Additional Measures scenario, emissions are projected to fall to 15,916 kt $CO_2$ eq. in 2025. By 2030, they are expected to reach 13,376 kt $CO_2$ eq., followed by a significant further reduction of 56% by 2040 compared to 2030 levels.

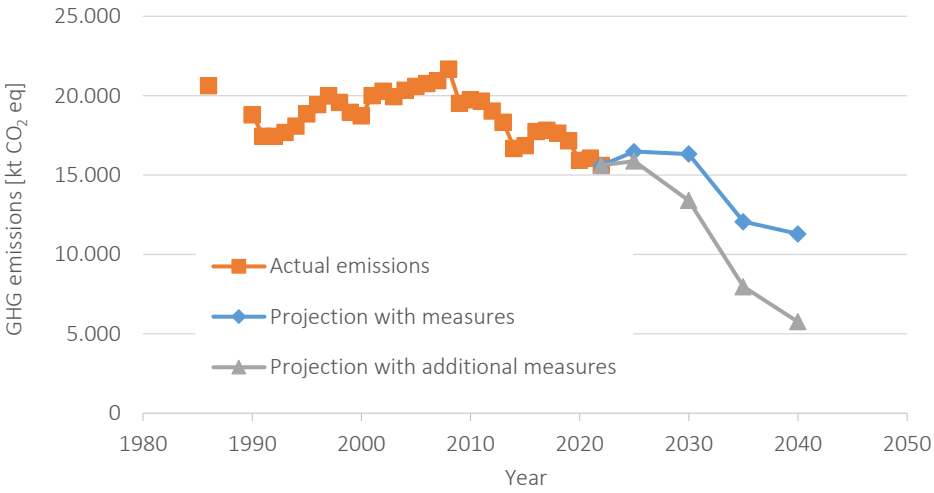


***Figure 1: Historical trajectory of emissions up to 2020, and projected emissions under the With Measures, With Additional Measures, and Without Measures scenarios from 2025 to 2040 (Source: EARS, IJS-CEU, KIS)***

Carbon dioxide ($CO_2$) accounts for the largest share of total GHG emissions in Slovenia. Under the With Measures scenario, its share is projected to rise from 81% in 2022 to 84% in 2030, before declining to 80% by 2040. Under the With Additional Measures scenario, the share gradually decreases to 80% by 2030, followed by a more pronounced drop to 64% in 2040. Methane ($CH_4$) represented 12% of total emissions in 2022. Under the With Measures scenario, its share is projected to decline to 11% by 2030, then rise to 14% by 2040. In the With Additional Measures scenario, methane's share increases further after 2030, reaching 13% in 2030 and 24% in 2040. Nitrous oxide ($N_2O$) accounted for 5% of total emissions in 2022. In the With Measures scenario, its share is projected to decline to 4% by 2030 and then increase to 6% by 2040. Under the With Additional Measures scenario, the share remains unchanged at 5% in 2030, before rising to 11% by 2040. Emissions of fluorinated gases (F-gases) are projected to decline significantly by 2040.

According to both projection scenarios, emissions from energy transformation and fugitive emissions are projected to increase by 2030—by 15% under the With Measures scenario and by 3% under the With Additional Measures scenario—before falling substantially by 2040, with reductions of 76% and 82%, respectively. Under the With Measures scenario, emissions from the industry sector are projected to increase by 2040, reaching a level 24% higher than in 2022. In contrast, under the With Additional Measures scenario, emissions are projected to decline, falling by 54% in 2040 compared to 2022 levels. As in the energy transformation sector, the majority of emissions in industry are covered by EU ETS, although to a lesser extent. In 2022, the transport sector accounted for 37% of total GHG emissions, making it the largest emitting sector. Emissions are projected to increase until 2030 under the With Measures scenario but are projected to decline thereafter. Under the With Additional Measures scenario, emissions are projected to start declining from 2025, resulting in a 25% reduction by 2030 compared to 2022, and a 71% reduction by 2040. Emissions from the other energy use sector are projected to decline under both scenarios, as a result of which their share in total emissions is also projected to decrease. The sector accounted for 8% of total emissions in 2022, dropping to only 6% by 2030 in both scenarios. By 2040, the share remains unchanged under the With Measures scenario, while under the With Additional Measures scenario, the share rises again to 8%. The industrial processes sector contributed 7% of total emissions in 2022. This share remains relatively stable, declining to 6% by 2030 in the With Measures scenario, before increasing to 9% by 2040. In the With Additional Measures scenario, the sector's share is projected to increase to 8% by 2030 and remains unchanged in 2040. Agricultural emissions remain relatively stable over time, with 2022 emissions 2% lower than in 2017. No significant reductions are expected in the projections. In the With Measures

scenario, emissions increase, whereas in the With Additional Measures scenario, they decline. In 2022, the waste sector accounted for 2% of total emissions. By 2030, the sector's share remains at 2%, and under the With Measures scenario, it stays at this level through 2040. Under the With Additional Measures scenario, the share stands at 4% in 2040.

According to the With Measures scenario, following a decline, removals are projected to rise again to –792 kt $CO_2$ eq. by 2030. After 2040, removals are expected to decrease to –154 kt $CO_2$ eq., primarily due to increased harvesting needs, including those linked to the unfavourable age structure of forests. Under the With Additional Measures scenario, net removals are projected to reach –2,089 kt $CO_2$ eq. by 2030 and –2,187 kt $CO_2$ eq. by 2040.

Emissions from sources covered by the EU Emissions Trading System (EU ETS) are projected to reach 5,624 kt $CO_2$ eq. by 2030 under the With Measures scenario, and 4,930 kt $CO_2$ eq. under the With Additional Measures scenario — both slightly above 2022 levels. By 2040, emissions are projected to decline significantly under both scenarios: to 2,922 kt $CO_2$ eq. under the With Measures scenario (a 40% reduction compared to 2022), and to 1,118 kt $CO_2$ eq. under the With Additional Measures scenario (a 77% reduction). In the With Measures scenario, emissions increase across all sectors by 2030 compared to 2022, and the same is projected in the With Additional Measures scenario, except for industry. However, by 2040, emissions decrease across all sectors, with the exception of industrial processes in the With Measures scenario. By 2040, the largest reductions are observed in fugitive emissions, which decrease by 100%, and emissions from energy transformations, which decline by 79%—a sector that also accounts for the largest share of total emissions. In the With Additional Measures scenario, reductions by 2040 are projected as follows: a 100% reduction in fugitive emissions, a 67% reduction in emissions from energy transformations, a 70% reduction in emissions from industrial processes, and a 51% reduction in emissions from industry.

Under the With Measures scenario, emissions from non-ETS sectors are projected to rise between 2022 and 2025, reaching 10,835 kt $CO_2$ eq. Thereafter, they are expected to decline to 10,701 kt $CO_2$ eq. by 2030 and further to 8,372 kt $CO_2$ eq. by 2040. Under the With Additional Measures scenario, emissions are projected to increase to 10,528 kt $CO_2$ eq. by 2025, followed by a reduction to 8,446 kt $CO_2$ eq. by 2030, and to 4,656 kt $CO_2$ eq. by 2040.

**Adaptation to climate change**

Slovenia's climate is characterised by diversity, shaped by its geographic location, complex topography, and proximity to the sea. The country experiences three primary climate types: temperate continental in the east, subalpine in the central regions, and sub-Mediterranean in the west. This climatic diversity influences the adaptive capacity of different regions to respond to the impacts of climate change. The lead institution for climate change adaptation is MECE, which cooperates with EARS, the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief, and the Climate Council, a scientific advisory body. In 2016, Slovenia adopted the Strategic Framework for Climate Change Adaptation, and adaptation is also addressed in the Long-Term Climate Strategy of Slovenia until 2050.

Climate projections based on EURO-CORDEX models indicate that, by the end of the century, average temperatures will rise between 1.3 °C (under an optimistic scenario) and 4.1 °C (under a pessimistic scenario). These changes are expected to lead to more frequent heatwaves, a longer growing season, and more extensive drought conditions. On the other hand, precipitation patterns are projected to become more extreme, with a higher frequency of intense rainfall events and an increased risk of flooding.

Climate change is also expected to have a substantial impact on key economic sectors, including agriculture and forestry. Increasing drought conditions and extreme weather events threaten food production, reduce water availability, and increase economic losses. Slovenia ranks among the most climate-vulnerable EU Member States, as climate-related losses

between 1980 and 2023 totalled approximately EUR 7 billion—the highest per capita loss in the EU.

In response to these risks, Slovenia is accelerating its adaptation efforts, including the development of a national adaptation strategy and regional action plans. Key priorities include improving water resource management, enhancing flood protection, strengthening the resilience of energy infrastructure, and promoting sustainable agricultural practices.

Slovenia has also committed to scaling up financing for adaptation measures. In 2023, EUR 19 million from the Climate Change Fund was allocated to adaptation measures. In addition, the government adopted a five-year recovery programme, valued at EUR 2.33 billion, for the reconstruction of infrastructure damaged by the 2023 floods.

Despite the measures already adopted, key challenges remain: a shortage of specialised personnel, limited financial resources, and the need to strengthen strategic planning at all levels of governance. To enhance climate resilience, Slovenia must improve institutional capacity, upgrade climate data monitoring systems, and foster greater policy coherence and integration between sectoral policies and adaptation measures.

**Climate finance and technology transfer**

Although Slovenia is not obligated to provide financial support to developing countries, it voluntarily contributes to climate finance. This is done through national policies, including the Development Cooperation and Humanitarian Aid Strategy, which identifies climate change mitigation and adaptation as key priority areas. The Ministry of Foreign and European Affairs (MFEA) serves as the main coordinator of development assistance, while MECE oversees multilateral climate finance. Slovenia channels climate finance through both bilateral and multilateral mechanisms. In 2021, Slovenia provided EUR 4.94 million in climate finance, of which 31.5% was delivered bilaterally. In 2022, the total contribution was EUR 4.76 million, with the bilateral share increasing to 49.3%. Funding was directed to sectors such as energy, water and sanitation, forestry, and agriculture. Mobilising private finance remains a challenge, as most projects continue to depend on public funding. In the area of technology development and transfer, Slovenia supports projects featuring advanced technological solutions. Examples include the use of satellite imagery for flood modelling in India and initiatives aimed at improving water resource management in Rwanda. Slovenia focuses on technologies that contribute to sustainable development and enhance climate resilience, with most support provided during the growth and maturity phases of technology deployment.

In terms of capacity-building, Slovenia finances projects aimed at supporting the development of knowledge and skills in partner countries. These include training programmes on sustainable natural resource management, the improvement of agricultural practices, and the development of business models. Both the public and private sectors participate in these efforts, although impact tracking mechanisms are still under development Slovenia is increasing its engagement in climate finance and participates in a number of multilateral organisations, including the World Bank, the Global Environment Facility (GEF), and the Food and Agriculture Organization of the United Nations (FAO). Through these channels, it supports climate adaptation, the improvement of energy efficiency, and the development of sustainable technologies. Looking ahead, Slovenia will focus on further mobilising private finance, strengthening systems for monitoring the impacts of climate finance, and enhancing regional cooperation in the implementation of climate-related projects.

# I. National inventory report of anthropogenic emissions by sources and removals by sinks of GHGs

The National Inventory Report on anthropogenic GHG emissions by sources and removals by sinks has been submitted separately and is available on the website of the United Nations Framework Convention on Climate Change (UNFCCC) (including the National Inventory Document (NID) with Annexes and Common Reporting Tables (CRTs) [2].

[2] https://unfccc.int/documents/644792
https://unfccc.int/documents/644829
Slovenia. 2024 National Inventory Document (NID). Annexes | UNFCCC

# II. Information necessary to track progress made in implementing and achieving nationally determined contributions (NDCs) under Article 4 of the Paris Agreement

59. Each Party shall describe its national circumstances relevant to progress made in implementing and achieving its nationally determined contribution (NDC) under Article 4 of the Paris Agreement, including:
(a) Government structure;
(b) Population profile;
(c) Geographical profile;
(d) Economic profile;
(e) Climate profile;
(f) Sector details.
60. Each Party shall provide information on how its national circumstances affect GHG emissions and removals over time.

## II.A National circumstances and institutional arrangements

### II.A.1 Government structure

Slovenia is a parliamentary democracy in terms of its political structure. The President of the Republic is elected by direct vote for a maximum of two five-year terms. The National Assembly of the Republic of Slovenia, the country's highest legislative body, consists of 90 Members of Parliament elected for a four-year term. The government is formed by the Prime Minister. The current government comprises 17 ministers, including three ministers without portfolio. Since 1 May 2004, Slovenia has been a member of the European Union.

In accordance with the Government of the Republic of Slovenia Act, MECE is responsible for policies and measures in the field of climate change. MECE also coordinates the preparation of measures for implementing climate policy in cooperation with other relevant ministries, particularly those responsible for transport, agriculture, nature, and spatial planning. MECE is further responsible for preparing reports on climate-related matters at both the EU and UN levels, collecting input data and documents from the relevant ministries. EARS, an administrative body within MECE, is responsible for compiling and reporting on emission inventories. EARS also manages the emissions trading registry and maintains environmental indicators, including those related to climate change.

Slovenia has 212 municipalities, which are the fundamental units of local government, 12 of which hold the status of urban municipalities. Each municipality has its own local administration and budget. Their responsibilities in reducing GHG emissions involve spatial planning, managing local and public transport (including the preparation of local transport strategies), developing local energy concepts (local energy plans), and overseeing waste collection and disposal.

### II.A.2 Population profile

At the beginning of 2023, Slovenia had a population of 2,116,972. During the year, the population increased by approximately 7,000, despite the fact that natural population growth was negative for the seventh consecutive year (-4,551 inhabitants). Overall population growth was driven by a high net migration rate (11,500). As of 1 January 2023, foreign nationals accounted for 9% of the population.

At the beginning of 2022, Slovenia recorded a slight population decline, primarily due to the high number of deaths caused by the COVID-19 pandemic in 2020 and 2021. Over the past four decades, the average age of Slovenia's population has increased by 10 years—rising from 34.4 years in early 1982 to 44 years at the beginning of 2023. At the start of 2024, the population of Ljubljana, the capital, was 297,575, with a population density of 1,082 inhabitants per km².

According to EUROPOP2023 population projections, Slovenia's population is expected to continue growing until 2026, after which it is projected to decline over the following 20 years. Forecasts indicate that on 1 January 2100, Slovenia's population will be 1,950,820, which is 156,000 fewer residents than in 2022.

While the birth rate is expected to increase slightly, the total number of newborns will remain low due to a declining number of women of childbearing age. Life expectancy is projected to continue rising, with men expected to live to 89.4 years and women to 93.3 years. This will contribute to a further increase in the proportion of elderly residents, as those aged 65 and over are expected to make up 32.1% of Slovenia's population by 2100 (compared to 21.1% in 2022). By 2100, young people (aged 0–19) are projected to account for 17.7% of the population.

## II.A.3 Geographical profile

Slovenia is located in Central Europe, with geographical coordinates of approximately 46° northern latitude and 15° eastern longitude. The country covers an area of 20,273 km². It shares borders with Italy, Austria, Hungary, and Croatia, the latter being its longest national border.

Despite its small size, Slovenia is a highly diverse country, as three distinct landscape types converge within its territory. In the north, the Julian Alps, the Karavanke, and the Kamnik-Savinja Alps gradually descend southwards towards the Adriatic Sea. The central hilly region, characterised by numerous valleys and basins—including the Ljubljana Basin, home to the capital, Ljubljana—is separated from the Adriatic Sea by the northern edges of the Dinaric Alps. In the northeast, the terrain levels out into the Pannonian Plain. Slovenia's coastline stretches 46.6 km along the Adriatic Sea. The varied terrain is reflected in an average land slope of 25%, while the country's mean elevation is 550 m above sea level.

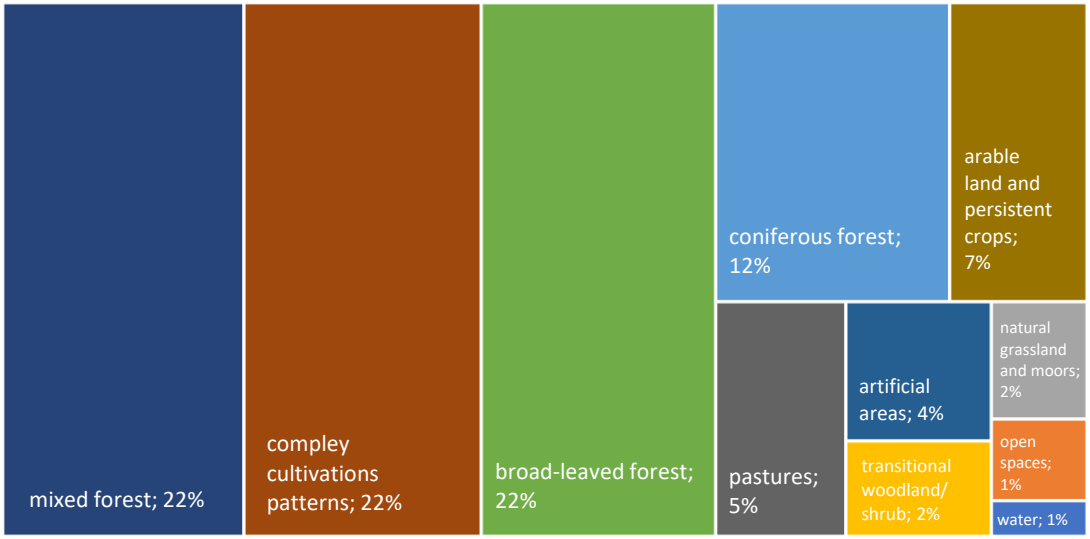


***Figure 2: Shares of individual land cover and land use categories (%), 2018 (Source: EARS environmental indicators)***

The diverse terrain, climatic and soil variations, extensive forested areas, and the preservation of traditional methods of managing parts of the cultural landscape contribute to Slovenia's high biodiversity, which is threatened by climate change.

Slovenia is home to approximately 22,000 animal and 3,500 plant species, more than 2,000 of which are listed on the national Red List of endangered species. More than 800 animal species and over 300 plant species benefit from protection. There are 355 Natura 2000 sites in Slovenia, covering over 37% of the country's territory. Forests account for 70% of Natura 2000 areas, while slightly more than 20% is agricultural land. Natura 2000 is a European network of special conservation areas designated by EU Member States with the primary aim of preserving biodiversity for future generations. These protected areas are therefore specifically intended to safeguard animal and plant species and their habitats that are rare or under threat at the European level due to human activities.

Slovenia has one national park, three regional parks, 47 landscape parks, one strict nature reserve, 57 nature reserves, and 1,275 natural monuments. Protected areas cover just over 13% of Slovenia's total land area. Since 1992, the share of protected land has increased by approximately 5.5 percentage points.

## II.A.4 Economic profile

In 2022 and 2023, Slovenia's economy fully recovered from the COVID-19 pandemic. In 2023, GDP increased by 12.4% compared to the previous year, reaching EUR 63,951 million. This increase is primarily attributed to a general rise in product prices, resulting in a real GDP growth of 2.1% in 2023 compared to 2022. The sectors contributing most significantly to GDP growth were construction, energy supply, manufacturing, and information and communication activities.

Slovenia's economic development, measured by GDP per capita in Purchasing Power Standards (PPS), was 91% of the EU average in 2023, an increase of 1 percentage point from 2022, matching the levels at the onset of the financial crisis (91% in 2008). Due to low investment levels, progress in productivity has been sluggish. The development gap in GDP per capita in PPS is attributed to low productivity, which reached 86% of the EU average in 2022.

Compared to other EU Member States, Slovenia still lags behind (Figure 2) in decoupling economic growth from resource use and the generation of GHG emissions. In 2022, the EU's emission productivity reached EUR 3.77 (2010) per kg $CO_2$ equivalent, while Slovenia's emission productivity was EUR 2.93 (2010) per kg $CO_2$ equivalent, 22% below the EU average. Since 2016, Slovenia has in fact experienced a consistent upward trend in emission productivity. In 2022, it increased by 5.4% compared to 2021.

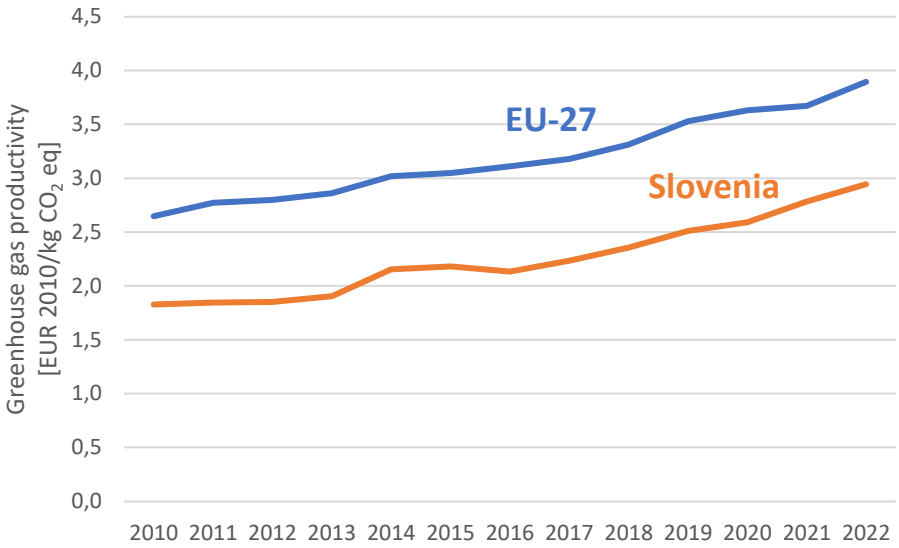


***Figure 3: Emission productivity of Slovenia compared to the EU-27 during the 2010–2022 period (Source: EUROSTAT)***

As regards the value-added structure, the largest share is held by industry, where manufacturing activities dominate with 32%. The second most important sector is trade, maintenance, and repair of motor vehicles, accounting for 17%. Compared to 2022, the largest increase in value-added share was recorded in electricity, gas, and steam supply. Value-added also increased in real estate activities, service industries, and construction.

In 2023, Slovenia exported EUR 54.9 billion worth of goods, while imports totalled EUR 57.1 billion. Both figures saw a slight increase compared to 2022—specifically, exports grew by 5%, while imports increased by 1%. The decline in exports was mainly due to reduced trade with EU Member States, which accounted for 55.6% of Slovenia's exports, whereas exports to non-EU countries increased, reaching 44.4%. Exports to Switzerland saw the highest increase, while exports to Germany, Italy, Croatia, and Austria experienced a slight decline compared to 2022. In 2023, the most significant import products were chemical products, machinery, and transport equipment, which together accounted for 62% of total imports, amounting to EUR 35.4 billion. Compared to 2022, exports of chemical products experienced the highest growth, increasing by 23%. Imports decreased due to reduced trade with EU Member States, which supplied 56.1% of all imported goods. Conversely, trade with non-EU countries strengthened, accounting for 43.9% of total imports. The most significant increases in imports were from China and Switzerland, while imports from neighbouring countries—Germany, Italy, Austria, and Croatia—declined compared to 2022. In 2023, the primary import products were chemical products, machinery, and transport equipment, together representing 62% of total imports, amounting to EUR 35.4 billion. Compared to 2022, imports of chemical products saw the highest growth at 23%, followed by beverages and tobacco at 17%, and food and live animals at 13%.

The employment rate for individuals aged 20–64 in Slovenia was 77.5% in 2023, surpassing the EU average of 75.3%. The at-risk-of-poverty rate for employed individuals stood at 5.8%, which was below the EU average of 8.3%. By the end of 2024, the number of employed persons reached 948,444—the highest recorded since the employment register began. The largest share of employees worked in manufacturing, followed by trade, motor vehicle maintenance and repair, and education.

## II.A.5 Climate profile

Despite its small size Slovenia has great geographical landscape diversity due to its position at the intersection of four major European geographical units: the Alps, the Mediterranean, the Pannonian Basin, and the Dinaric Alps. As a result, the climate of this small piece of land is also extremely varied, due to the transit character and influence of three major climate types: Alpine, Mediterranean and Continental. The diverse geology of such a small area makes it highly susceptible to landslides and debris flows. This is exacerbated by the increasing intensity of rainfall, which is an important triggering factor that is projected to increase in the future.

In the period 1950–2023 the average air temperature increased by 2.0 °C (Figure 4). A significant rise in temperatures has been recorded since the mid-1980s. Observed linear temperature trend on a national scale over the period 1950–2023 is +0.34 °C per decade. The largest trend is observed in summer (+0.44 °C per decade), the smallest in autumn (+0.23 °C per decade), while winter and spring experienced similar trends (+0.33 and +0.31 °C per decade respectively). Since 1990 the linear temperature trend amounts to +0.60 °C per decade. Changes in temperature indicators have also been recorded. Heat related temperature extremes are becoming more frequent and stronger, while extremes associated with cold are becoming less frequent and less intense.

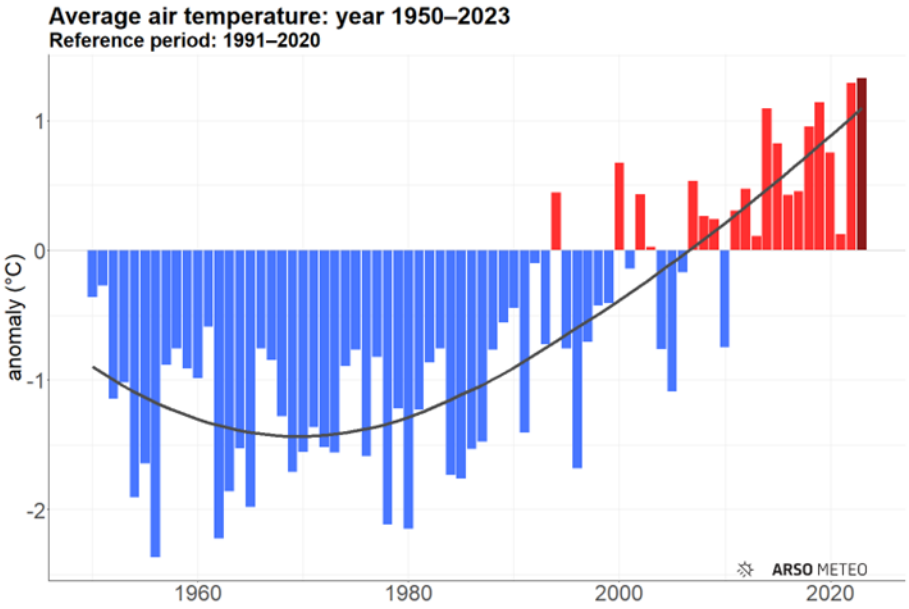


***Figure 4: Annual temperature anomalies on a national scale from 1950 to 2023 relative to the average of the thirty-year reference period 1991–2020.***

With rising temperature other climate characteristics are changing as well. The signal for precipitation is not uniform and is highly variable in space and time (Figure 5). From 1950 to 2023, there has been a decreasing trend in annual precipitation sums by up to 2 % per decade, except in northeastern Slovenia, where an increasing trend prevailed. None of these changes are statistically significant, except at a few rare locations. In the last 25 years (since around year 2000) the decreasing precipitation trend has stagnated and even changed to an increasing trend. The linear trend on a national scale in the period 1950–2023 amounts to –0,61 % per decade, but the trend is too small to be statistically significant. In other seasons, at least for the period 1950–2023, the precipitation trends are not significant as well.

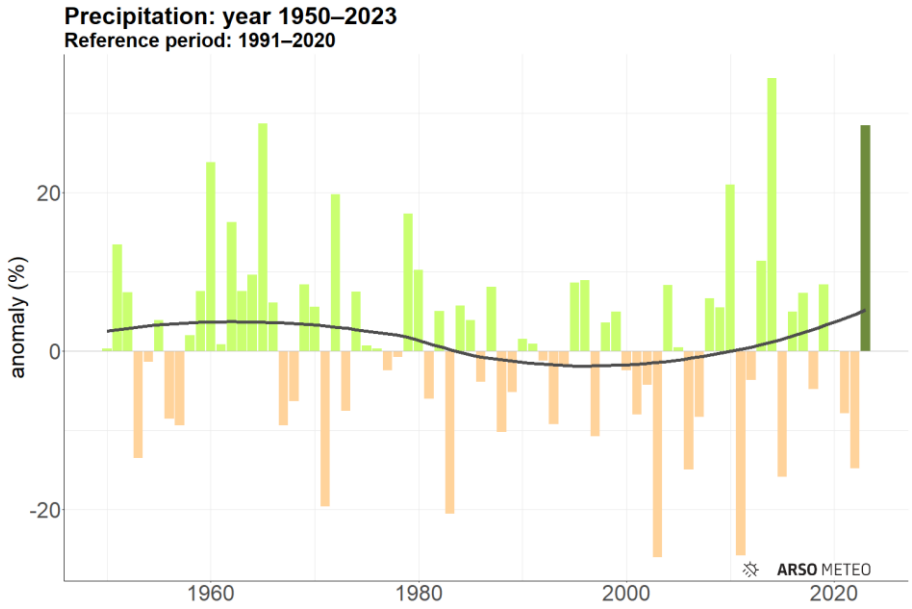


***Figure 5: The relative deviation of annual precipitation levels on a national scale from 1950 to 2023 relative to the average of the thirty-year reference period 1991–2020. Above-average years are marked in green, and below-average years in brown. Year 2023 is marked with a darker color.***

Snow cover, an important natural water retention element, has at least halved in the last six decades, what has already had a significant influence on the river flow regime, with lower late spring pick and higher late autumn peak. Although the extreme events are rare by definition and therefore it is difficult to detect their significant change it is evident that all climate indicators for extreme heat, extreme precipitation and drought show increasing trend for their intensity as well as for their frequency.

EARS is preparing monthly, seasonal and annual climate reports that are available on web page[3], on EARS's social media (Facebook[4], X[5]) and in EARS monthly bulletin[6].

**Climate in years 2022 and 2023**

The average air temperature in 2022 in Slovenia was 10.7 °C. A national average anomaly of the air temperature relative to the average of the 30-year reference period 1991–2020 was slightly below 1.3 ° C on a national scale, which at the time meant that 2022 was the warmest year on record, later surpassed by year 2023. All four seasons in 2022 were warmer than average. The largest deviation from the average was in the summer, at 2.1 °C above the 1991–2020 average at the national level. The annual precipitation level across the country was below the 1991–2020 average. On a national scale, an average of 1223 mm of precipitation fell. The precipitation index was around 85 %, making 2022 one of the seven driest years since 1950. The driest season was summer, receiving around 63 % of the usual amount of precipitation, making it one of the three driest summers since 1950. The combination of high temperatures and lack of precipitation in spring and summer led to drought and in July of 2022 to a largest wildfire in Slovenian history, affecting over 2000 ha of Slovenian and Italian part of Kras (Karst) region.

The average air temperature in 2023 in Slovenia slightly exceeded the record year 2022. The average air temperature deviation was slightly above 1.3 °C from the 1991–2020 average (Figure 6). Autumn was by far the warmest on record, with a deviation of 2.5 °C, making it 0.8

[3] https://meteo.arso.gov.si/met/sl/climate/current/
[4] https://www.facebook.com/ArsoVreme/
[5] https://x.com/meteoSI
[6] https://www.arso.gov.si/o%20agenciji/knji%c5%benica/mese%c4%8dni%20bilten/

°C warmer than the second warmest autumn in 2006. The temperature was above average in both winter and summer, while spring was slightly cooler than average. Year 2023 is the thirteenth consecutive year with a positive temperature deviation compared to the 1991–2020 average. In this millennium, only five years (2001, 2004, 2005, 2006, and 2010) have had a negative temperature deviation. The annual precipitation level on a national scale was significantly above the 1991–2020 average, with 1866 mm of precipitation recorded. The precipitation index was around 129 %, making the year 2023 one of the three wettest years since 1950. The summer of 2023 was exceptional in terms of precipitation, with the precipitation index reaching 163 %. This is the highest value at least since 1950, nearly 20 percentage points higher than the next wettest summer in 1989 (with an index of 145 %). Both July and August were very wet. The main reason for the high precipitation in August was the heavy rainfall from August 3rd to August 5th, during which huge amounts of rain fell in recurring downpours from western Slovenia to Carinthia and northern Styria (with some areas receiving over 300 mm). In combination with prior wet conditions from July, this precipitation caused extensive floods and catastrophic devastation across much of Slovenia (in 183 out of 212 municipalities, with 104 municipalities severely impacted).

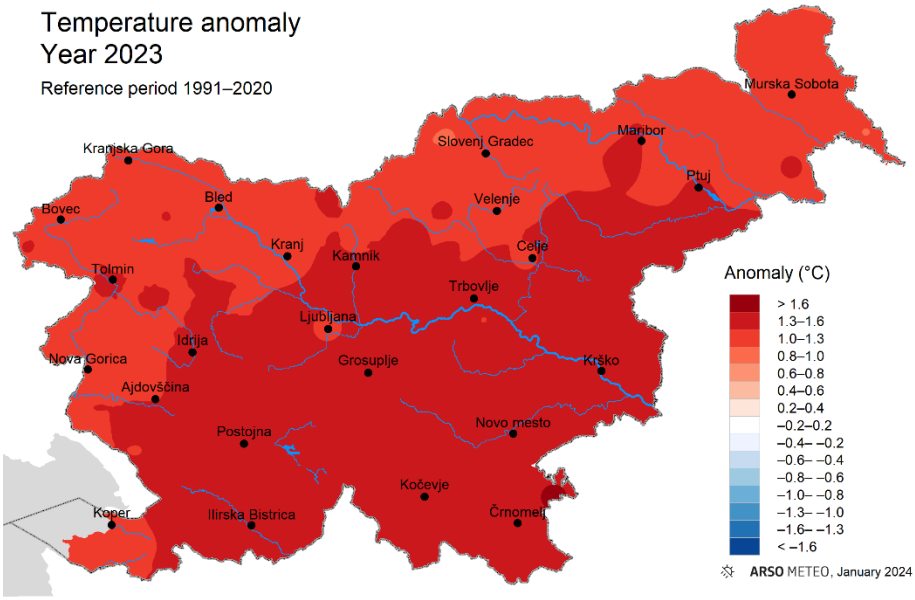


***Figure 6: The deviation of the average air temperature in 2023 from the average of the 30-year reference period 1991–2020***

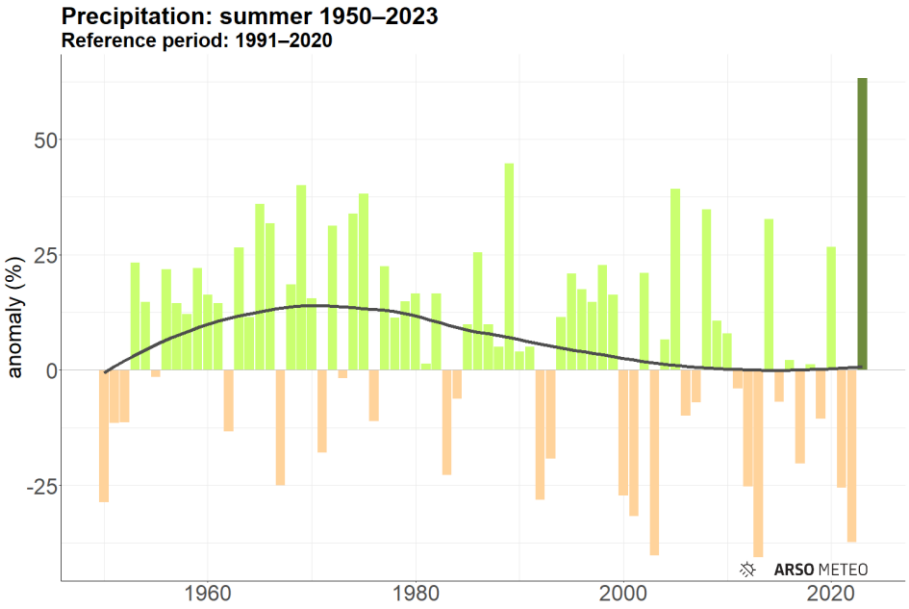


***Figure 7: The relative deviation of summer precipitation levels on a national scale from 1950 to 2023 relative to the average of the 30-year reference period 1991–2020. Above-average years are marked in green, and below-average years in brown. The summer of 2023 is marked with a darker color.***

## II.A.6 Sector details – Energy

Energy consumption remains the primary source of GHG emissions in Slovenia. In 2022, including fugitive emissions, it accounted for 79% of total emissions. The largest contributors to emissions are transport and the production of electricity and heat.

### Energy supply

Since 1992, energy supply has generally increased, peaking in 2008, when it was 50% higher than in 1992. However, due to the economic crisis, energy efficiency measures, and milder winters, supply saw a general decline, reaching a level that was 15% lower in 2015. It grew again until 2018, after which a downward trend resumed and has continued. In 2023, energy supply was 17% lower than in 2005. Petroleum products accounted for the largest share of the energy supply mix (35%) in 2023, followed by nuclear energy (24%). Renewable energy sources (RES) made up 20%, while solid fuels contributed 12%, and natural gas represented 11%. Waste accounted for 1% of the total energy supply. The total energy consumption structure showed net electricity imports at -2%, indicating that Slovenia exported more electricity than it imported. As regards fossil fuels, Slovenia produces only solid fuels.

The composition of Slovenia's energy supply mix underwent notable changes between 1992 and 2023. The share of liquid fuels (crude oil and petroleum products) increased between 1992 and 2000, then stabilised at approximately 35%, except during the COVID-19 years (2020 and 2021) and in 2008, when consumption peaked. Between 1992 and 2014, nuclear energy maintained a steady 20% share, but following operational optimisations in 2011, its share increased, reaching 25% in 2014. This proportion fluctuates due to the 18-month maintenance cycle of the nuclear power plant. The share of gaseous fuels remained around 12% between 1992 and 2010 but declined to 10% thereafter. It rose again in 2021, reaching 12%, but later declined due to price shocks. Since 2000, solid fuels have been primarily used in electricity and heat production, as well as in industrial processes such as pulp and paper production and cement manufacturing. However, their share has been gradually declining. By contrast, the share of renewable energy sources in the energy supply has been increasing, particularly since 2000, reaching its highest level of 20% in 2023.

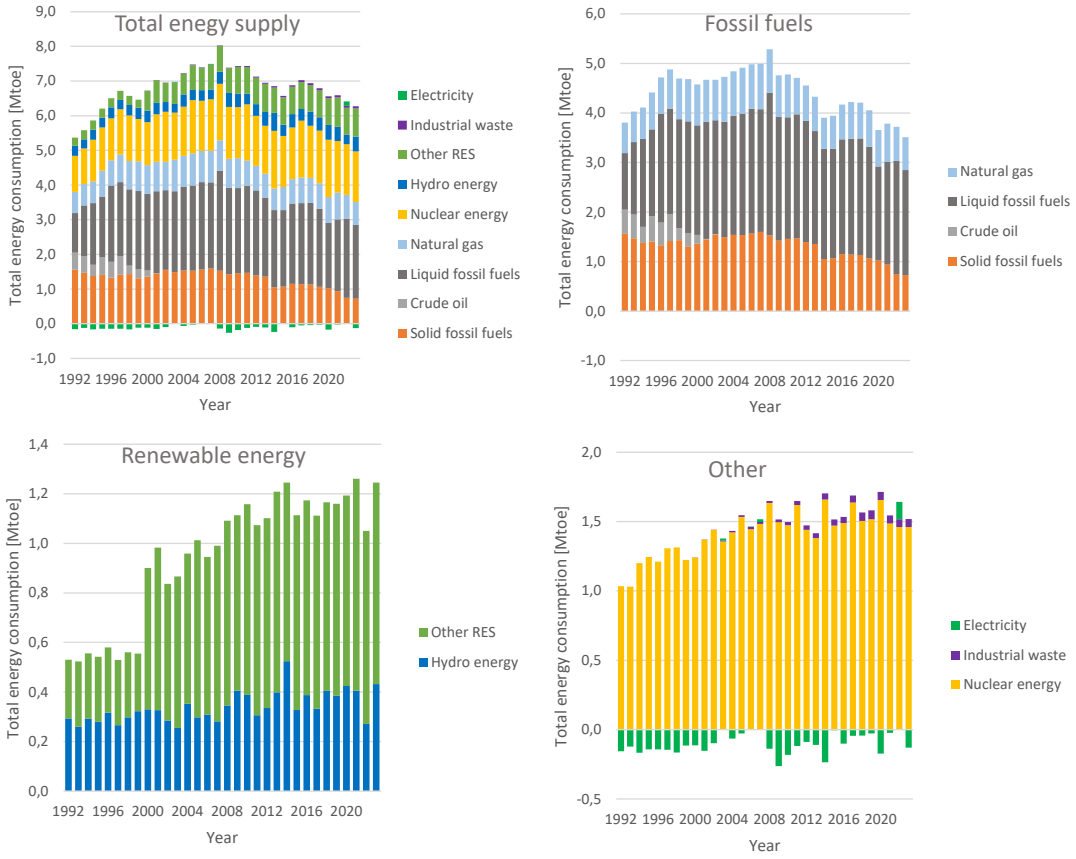


***Figure 8: Energy supply by energy source, 1992–2023 (Source: Statistical Office of the Republic of Slovenia (SORS))***

## Final energy consumption

In 2023, final energy consumption was 39% higher than in 1992. The highest recorded level of final energy consumption was in 2008, reaching 5,505 ktoe, while the lowest was in 1992, at 3,279 ktoe. The increase in total final energy consumption between 1992 and 2023 was primarily driven by growth in the transport sector and other consumption.

In 2023, energy consumption in transport amounted to 1,854 ktoe, representing a 109% increase (an additional 969 ktoe) compared to 1992, but 11% lower than in 2008, when transport-related energy consumption peaked. In 1997, consumption in transport reached its highest level of the 1990s, largely due to fuel tourism. Following policy measures adopted by neighbouring countries, consumption declined until 2000. Between 2005 and 2008, energy use in transport grew rapidly, driven by EU enlargement and competitive fuel prices in Slovenia. In 2009, the economic crisis and changes in fuel price differentials with neighbouring countries led to a significant reduction in consumption. In subsequent years, transport energy consumption fluctuated, influenced by fuel price differentials, while in 2020, it fell sharply due to COVID-19-related measures. In addition to domestic transport, transit traffic through Slovenia plays a major role in shaping energy consumption in the transport sector. Given Slovenia's small size, fuel sold to transit vehicles significantly affects the country's energy balance, at times accounting for up to 30% of total transport energy consumption. In 2023, the transport sector accounted for 41% of total final energy consumption, substantially more than any other sector.

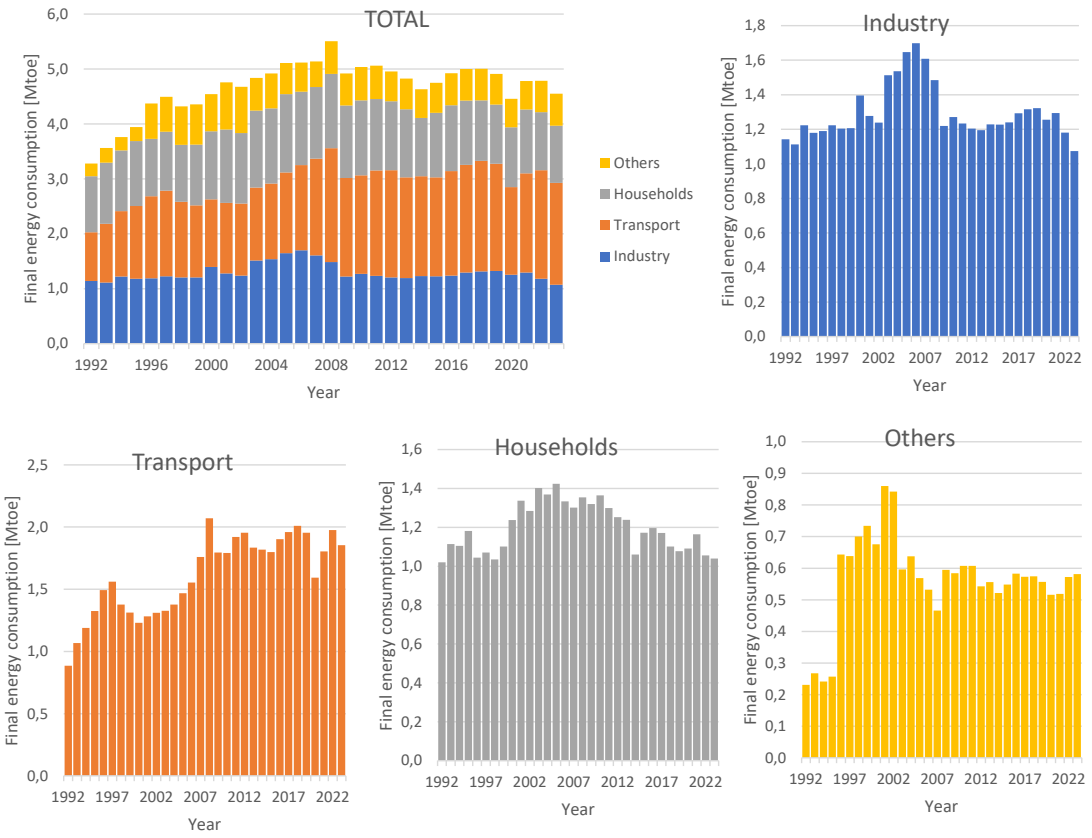


***Figure 9: Final energy consumption by sector, 1992–2023 (Source: SORS)***

In the manufacturing and construction sectors, energy consumption slowly increased until 2002, followed by a period of more rapid growth until 2007. Subsequently, the economic crisis led to a prolonged decline in consumption A renewed increase was observed between 2017 and 2019, driven by accelerated economic growth. However, in 2022 and 2023, energy consumption declined due to the cessation of primary aluminium production in Slovenia and high energy prices, which impacted almost all industries. Compared to 1992, energy consumption in 2023 was 6% lower, reaching 1,073 ktoe, with the highest recorded level in 2006 at 1,698 ktoe. In 2023, the manufacturing and construction sectors accounted for 24% of total final energy consumption.

Following an increase from 1998 onwards, household final energy consumption began to decline after 2005, with some fluctuations. Trends in household energy consumption are heavily influenced by climatic conditions and the decline in energy consumption is largely driven by the implementation of energy efficiency measures. Over the observed period, household energy consumption peaked in 2005 at 1,424 ktoe. Compared to 1992, consumption in 2023 was 2% higher. In 2023, households accounted for 23% of total final energy consumption.

In the “other consumption” sector (comprising the service sector and agriculture), energy consumption in 2023 was 152% higher than in 1992. The most significant increase occurred in 1996, when consumption rose by 150% due to methodological changes. Since 2000, consumption in this sector has fluctuated significantly. From 2022 onwards, data have been collected through surveys, which has also contributed to the increase in recorded consumption. Prior to that, energy consumption was calculated as the remainder. In 2023, the other consumption sector accounted for 13% of total final energy consumption.

| | 1992 | 2000 | 2010 | 2015 | 2020 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Final Energy Consumption [ktoe] | 3,279 | 4,540 | 5,034 | 4,748 | 4,455 | 4,785 | 4,548 |
| **Energy Consumption by Sector** | | | | | | | |
| Industry[7] | 35% | 31% | 25% | 26% | 28% | 25% | 24% |
| Transport | 27% | 27% | 36% | 38% | 36% | 41% | 41% |
| Households | 31% | 27% | 27% | 25% | 24% | 22% | 23% |
| Other Consumption | 7% | 15% | 12% | 12% | 12% | 12% | 13% |
| **Energy Consumption by Energy Source** | | | | | | | |
| Solid Fuels | 6% | 2% | 1% | 1% | 1% | 1% | 0% |
| Petroleum Products | 44% | 49% | 48% | 46% | 42% | 47% | 46% |
| Natural Gas | 13% | 13% | 12% | 12% | 13% | 12% | 11% |
| Renewable Energy Sources | 8% | 12% | 14% | 15% | 16% | 14% | 15% |
| Electricity | 23% | 20% | 20% | 23% | 25% | 23% | 23% |
| Heat | 6% | 4% | 4% | 4% | 4% | 3% | 3% |

***Table 1: Final energy consumption and sectoral breakdown by energy source in selected years (Source: SORS)***

## Electricity generation

In 2023, total electricity generation at the generator level reached 15,876 GWh. The largest share of electricity generation came from renewable energy sources (40%), followed by nuclear power (35%), while solid fuels accounted for 20%. Under an intergovernmental agreement, half of the electricity generated by Slovenia's nuclear power plant is allocated to Croatia. Electricity generation from natural gas remains minimal, while production from other sources is negligible. Slovenia also operates a pumped-storage hydropower plant. Total electricity generation was 5% higher in 2023 compared to 2005.

Fluctuations in the shares of electricity generation by fuel type are driven by changes in climatic conditions, including river flow conditions affecting hydropower generation and, to a lesser extent, river temperatures impacting nuclear power plant cooling, as well as nuclear power plant maintenance cycles In 2015, the commissioning of a new unit at Slovenia's largest thermal power plant led to a notable decline in electricity generation from other thermal power plants. However, electricity generation from solid fuels continues to decrease, as older units have been phased out. The trend in electricity generation from renewable energy sources has been positive between 2002 and 2023. For nuclear power generation, three-year fluctuations are observed, reflecting the 18-month maintenance cycle of the nuclear power plant.

[7] Manufacturing Industries and Construction

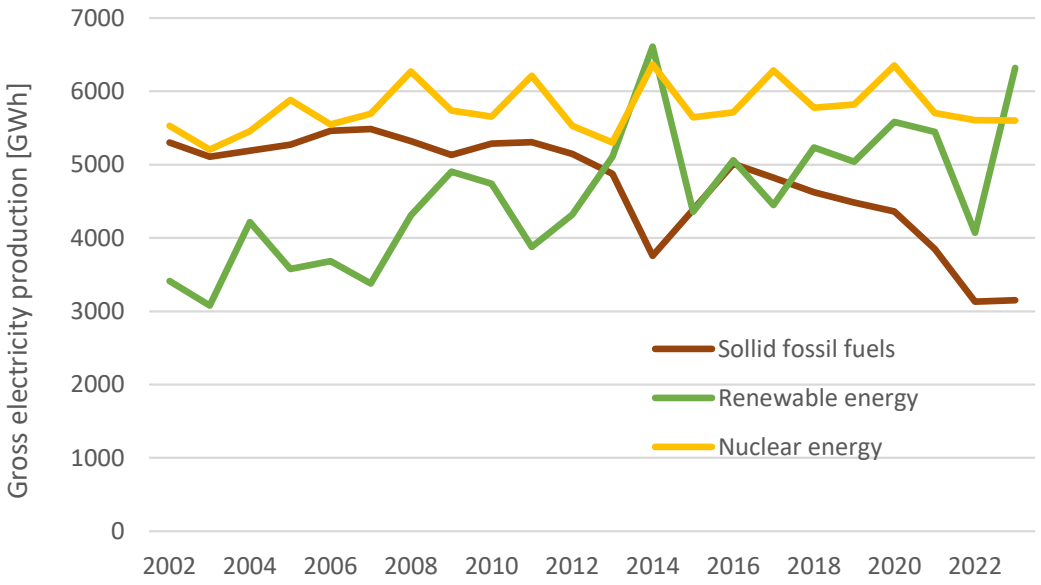


***Figure 10: Electricity generation at the generator level by main fuel type (Source: SORS)***

## II.A.7 Sector details – Transport

The volume of road passenger transport by passenger cars has been increasing continuously since 1991. According to Eurostat and SORS, passenger-kilometres (pkm) increased from 12,606 million pkm in 1991 to 29,119 million pkm in 2023, representing a 131% rise. Since 2000, the volume of passenger car transport has shown a continuous increase throughout the entire period, with the exception of four years (2010, 2012, 2013, and 2020). The most significant decline occurred in 2020, primarily due to the impact of the COVID-19 pandemic. By the end of 2023, Slovenia had over 1.2 million registered passenger cars, a 29% increase compared to 2005. In 2023, the motorisation rate was 579 registered cars per 1,000 inhabitants, up from 297 in 1991 and 518 in 2010. Among all registered passenger cars in 2023, 50% were diesel-powered, 46% were petrol-powered, and 2% were hybrid-powered, while over 16,000 were electric vehicles (battery electric and plug-in hybrids), accounting for 1% of the total number of registered passenger cars. Although the number of electric vehicles is increasing, the growth rate remains below the EU average. Since 2021, the share of first-time registered used vehicles has risen significantly, largely due to supply chain disruptions affecting new car deliveries and the high cost of new vehicles. In 2023, the average age of passenger cars in Slovenia reached 11.1 years, over four years older than in 2000. According to Eurostat and SURS, in 2023, 93% of passenger-kilometres in Slovenia were travelled by passenger car, 2% by public bus, and 2% by rail.

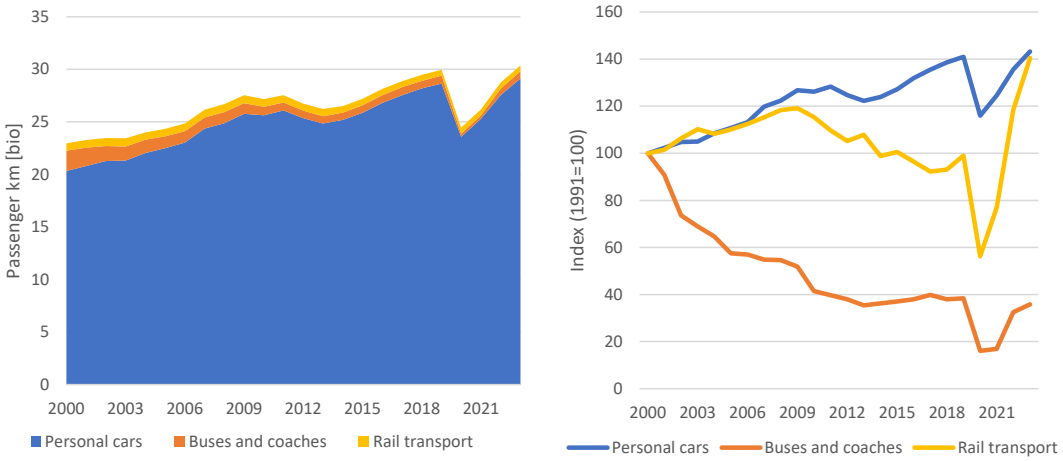


***Figure 11: Passenger-kilometres by passenger cars, public road transport, and rail transport (Source: Eurostat and SURS)***

Between 1990 and 2005, bus passenger transport in Slovenia declined significantly due to market contraction following independence, low fuel prices, greater accessibility of personal vehicles, and low parking costs. Additionally, the lack of a strategic vision for public transport development resulted in poorly developed networks and route discontinuations. The next major decline occurred in 2010, primarily due to improved passenger monitoring methodologies following the introduction of digital journey validation systems. The downward trend in bus transport continued until 2013, when volumes stabilised. The only exceptions were 2020 and 2021, due to COVID-19 pandemic measures. In 2022 and 2023, bus transport volumes increased but remained below 2019 levels. The introduction of integrated public transport and a unified subsidised fare system supported gradual growth between 2014 and 2019. However, the establishment of a national public transport agency, new concession agreements, and intensified policy measures from 2024 onwards are expected to further strengthen bus passenger transport.

In 1990, rail passenger transport in Slovenia totalled 1,429 million passenger-kilometres (pkm) but was severely affected by the dissolution of Yugoslavia and the subsequent economic downturn, leading to a decline of nearly two-thirds. A moderate recovery followed in the previous decade, with rail transport reaching 840 million pkm in 2009. Subsequently, rail passenger volumes declined again, primarily due to railway track renovations and improved passenger counting methodologies. In 2019, rail transport totalled 698 million pkm. In 2020, during the COVID-19 pandemic, and in the post-pandemic year of 2021, passenger volumes declined sharply. Strong growth followed in 2022 and 2023, mainly driven by improvements in railway services, particularly the introduction of new train sets and infrastructure upgrades. As a result, in 2023, rail passenger transport reached 990 million pkm, its highest level since 1991. However, the total number of rail passengers in 2023 remained below peak levels recorded between 2006 and 2010.

Air transport in Slovenia also experienced significant market losses following independence, but saw rapid growth, particularly in the mid-2010s. In 2019, Slovenia's only national airline, Adria Airways, ceased operations, significantly affecting passenger volumes. Nevertheless, air passenger numbers in 2019 remained 47% higher than in 2012. Due to the impact of COVID-19 pandemic, air transport declined sharply in 2020, and as of 2023, passenger volumes had not yet returned to 2019 levels.

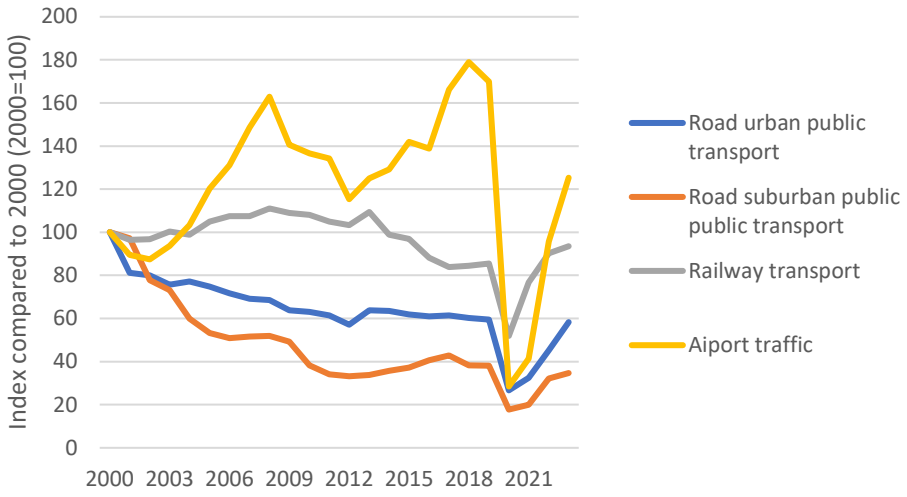


***Figure 12: Passenger volumes in urban, suburban road, and rail public transport, as well as air passenger transport (Source: SURS)***

In Slovenia, the strong growth of freight transport has been driven by the country's geographical location and open economy and has been further stimulated in recent years by high levels of international trade. This growth is also a result of Slovenia's strategic position at the intersection of the V and X European transport corridors, where both domestic and international freight transport have expanded significantly following the last two EU enlargements. Furthermore, Slovenia's accession to the EU eliminated many administrative barriers for Slovenian road hauliers, particularly previous restrictions on transport permits for operations across EU Member States. As a small Central European country, Slovenia has a naturally high share of international freight transport and a lower proportion of domestic freight movements. The Port of Koper also plays a crucial role in generating freight transport flows within Slovenia. The rapid expansion of both road and rail freight transport continued until the 2009 economic crisis, driven by strong economic growth both domestically and internationally, particularly in Eastern Europe.

Between 2001 and 2008, the growth rate of freight transport by Slovenian road hauliers was nearly three times higher than GDP growth. The global financial crisis led to only a temporary decline in both modes of freight transport. In 2016, road freight volumes surpassed pre-crisis levels by 15%, while rail freight volumes exceeded them by 24%. Meanwhile, GDP in that year remained slightly below 2008 levels. Road freight volumes continued to grow in 2019 but declined slightly in 2020 due to COVID-19-related restrictions. However, by 2021, they had already reached a record high. In the past two years, freight transport volumes have declined due to worsening economic conditions. Rail freight also contracted slightly in 2020 but rebounded in 2021. In the most recent year, rail freight volumes declined again, although to a lesser extent than road freight transport.

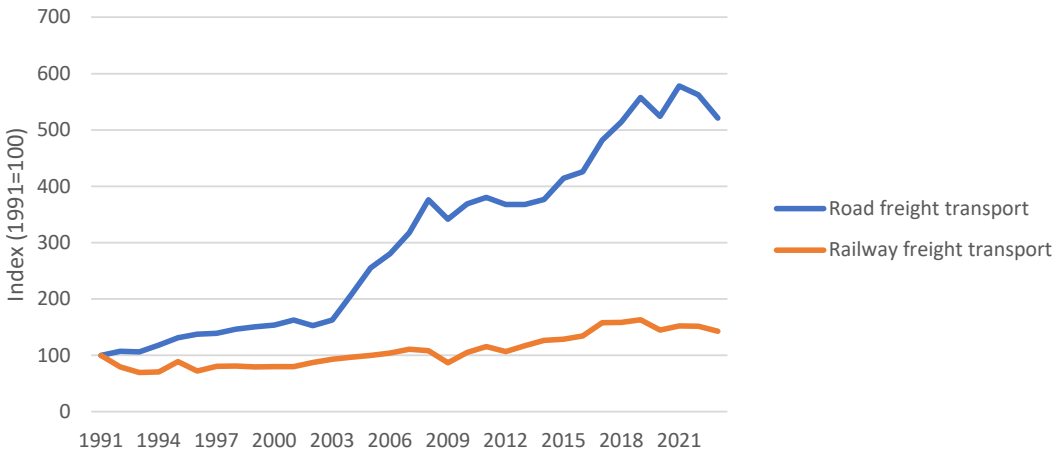


***Figure 13: Trends in road and rail freight transport (Source: SURS)***

The share of rail freight transport in total inland freight transport has been declining in recent years, as it has not kept pace with the growth of road freight transport. Its highest share was recorded in 2017, at just over 24%, but in 2020, it had fallen to 19%, as rail freight transport declined more sharply than road transport during the COVID-19 pandemic. In the past two years, the share has further decreased to 17%.

GHG emissions from transport have increased in line with rising energy consumption in the sector, contributing a relatively large share to Slovenia's total GHG emissions. Between 1986 and 2022, transport-related GHG emissions nearly tripled. In 2022, transport emissions accounted for 37% of total national emissions, making it the most significant sector. Between 2005 and 2022, emissions increased by 32%. Due to pandemic-related restrictions, emissions in 2020 were significantly lower than in the previous year (by 18.7%). However, they then rose sharply, returning to pre-2020 levels. Road transport accounts for 99.6% of total emissions in the transport sector, with passenger transport contributing around two-thirds and freight transport making up the remaining third.

## II.A.8 Sector details – Industry

Slovenia is among the more industrialised countries in Europe. In 2022, the industrial sector contributed 25.7% to Slovenia's GDP. Manufacturing accounted for 22.6% of total added value in 2022, compared to 25.1% in 1995. In 2023, Slovenia had 228,944 active enterprises, of which 9.2% operated in the manufacturing sector, employing a total of 226,656 people. In 2022, the metal industry had the highest number of employees within the manufacturing sector, followed by the mechanical and chemical industries. Foreign nationals accounted for approximately 15% of the workforce, while the remainder were Slovenian citizens. In 2022, two-thirds of the employed population held a secondary education qualification, 22.4% had a higher or university degree, and 12.3% had completed only primary education or less. The largest share of employees fell within the 40–44 age group, followed by the 45–49 age group. The highest added value per employee in 2022 was recorded in the chemical industry, exceeding EUR 81,000, followed by the non-metallic minerals and paper industries. According to the European Innovation Scoreboard, Slovenia is classified as a moderate innovator, achieving 95.1% of the EU average.

## II.A.9 Sector details – Housing and the structure of urban areas

According to the Statistical Office of Slovenia, the housing stock in Slovenia comprised just over 864,300 dwellings at the beginning of 2021, of which more than 80% were occupied. This represents an increase compared to 2015. Between 2011 and 2021, over 36,000 dwellings

were built, with the majority (87%) privately owned. In 2021, the average dwelling size was 83 m². The majority (62%) had three or more rooms, while 25% were two-room dwellings, and 13% were one-room dwellings. Among all occupied dwellings, 60% were located in single- or two-dwelling houses, accommodating 66% of Slovenia's population. Home-ownership remains a defining feature of Slovenia's housing sector, with over 92% of dwellings owner-occupied in 2021. Nearly 79% of occupied dwellings were inhabited by their owners or their family members, down slightly from 80.8% in 2018.

Approximately 20% of dwellings lacked central heating, while 5% did not have a bathroom. The highest share of dwellings without central heating was recorded in the Obalno-kraška and Goriška statistical regions, which also have Slovenia's mildest climates.

## II.A.10 Sector details - Agriculture

In 2023, Slovenia had 50,531 agricultural holdings, representing a 7% decrease from 2020, when there were 54,599 holdings. Compared to 2020, the number of holdings with 20 hectares or more of utilised agricultural land increased by 13%.

Permanent grasslands and pastures accounted for the largest share of utilised agricultural land (56%), followed by arable land (38%) and permanent crops (6%). The total area of utilised agricultural land increased by more than 2% compared to 2020. According to the new methodology in effect since 2023, the average agricultural holding in Slovenia covers 8.8 hectares, including 5 hectares of permanent grassland and pastures, 3.4 hectares of arable land, and 0.5 hectares of permanent crops.

In 2023, the majority of agricultural holdings raised poultry, followed by those rearing cattle, pigs, sheep, and goats. Compared to 2020, the number of holdings raising cattle declined by 9%, while those rearing poultry and pigs increased by 16%, despite an overall decline in the number of pigs.

In 2023, gross value added in agriculture accounted for 0.9% of GDP, slightly higher than in 2021. The sector employed 71,205 people, 2% fewer than in 2022 and also lower than in 2021. As in previous years, most workers were self-employed (66,800).

In 2023, the value of agricultural production totalled EUR 1.581 billion, 1% lower than in 2022 but higher than in 2021, when it amounted to EUR 1.319 billion. The decline was driven by lower prices. According to estimates, the value of crop production in 2023 was EUR 811 million, a 3% decrease from the previous year. While crop prices were lower, production volumes increased. The most significant declines in crop production value were recorded for cereals and fruit —due to lower prices in the case of cereals and lower production volumes for fruit. In contrast, the value of livestock production increased by 1% compared to 2022, reaching EUR 732 million. This increase was driven by higher prices, despite a decline in production volume.

The share of agricultural land dedicated to organic farming continues to grow. Between 1999 and 2022, the area of land under organic farming expanded from 2,400 hectares to 53,202 hectares, increasing from 0.5% to 11.1% of all utilised agricultural land. Permanent grassland accounted for the vast majority of organic farmland, representing 79% of total organic agricultural land in 2022, followed by arable land and gardens (14.2%) and permanent crops (6.7%). This suggests that organic farming is primarily adopted by livestock farms. In 2023, the average certified organic farm cultivated approximately 14 hectares of agricultural land, including just under 11 hectares of permanent grassland, 2 hectares of arable land, and around 1 hectare of permanent crops. Organic farming is most prevalent in areas with extensive grasslands, such as the Karst regions of the Primorska, Notranjska, and Kočevska areas, as

well as the higher-altitude areas of Koroška. Conversely, organic farming is least common in lowland areas with favourable conditions for intensive agriculture.

## II.A.11 Sector details – Land Use and forestry

The forested area in Slovenia has been steadily expanding over the past centuries. However, this growth has slowed since 2010. In 2022, forests covered 58% of Slovenia's total land area, placing the country third among EU Member States in terms of forest cover. While forest expansion continues in areas already rich in forests, regions with intensive agriculture and suburban development face growing pressure on forested land, increasing the risk of deforestation. European beech (32.9%) and Norway spruce (30.1%) dominate Slovenia's forest composition, followed by silver fir, oak species, and pine species. Broadleaf trees account for 56% of total timber stock, while conifers make up 44%. Slovenian forests are ageing, with an unfavourable distribution of developmental stages— there is a shortage of younger trees, while the proportion of overmature trees is excessively high.

However, over the past decades, Slovenia's forests have strengthened in timber stock and growth, increasing by more than 140% over the past 70 years. Timber harvesting is influenced not only by natural conditions but also by socio-economic factors. The increase in timber stock results from sustainable forest management and, to some extent, methodological changes in forest management practices. Timber harvesting trends in Slovenia have varied significantly, from 100% of total growth in the 1950s to less than 40% in the early 1990s. In 2022, harvesting reached 52% of annual forest growth. However, in 2023 and 2024, Slovenia's forests experienced multiple natural disturbances, including wind throws, floods, and bark beetle infestations, leading to a high proportion of salvage logging, which accounted for 42% of total annual harvesting in 2023.

In 2021, net removals from the LULUCF sector amounted to -3,106 kt $CO_2$, reflecting a 57% reduction in removals compared to 2005. Forested land contributed 95% to the net removals, remaining the largest carbon sink. Other contributors included grasslands and harvested wood products, while emissions sources included croplands, wetlands, settlements, and other forest land. Compared to 2005, removals declined across all categories except wetlands. Between 2011 and 2021, removals in the LULUCF sector decreased by more than 50%, primarily due to forestry policies promoting increased harvesting and the impact of natural disturbances.

In 2023, the gross value added of forestry accounted for 0.6% of Slovenia's GDP, slightly lower than in 2021. The total value of forestry production reached EUR 817 million in 2023, a 2% increase from 2022, driven by higher forestry product and service values. The value of forestry products increased by 1% compared to 2022, reaching EUR 727 million in 2023, which was 27% higher than in 2021. The largest share of forestry products came from standing timber (52%) and sawn logs (28%), though both shares declined slightly compared to the previous year.

In 2023, approximately 6,247 individuals were employed in forestry production, a slight decline from 2021 and 2022. The majority of those employed in the sector were self-employed forestry workers.

## II.A.12 Sector details – Waste

Following a decline after the 2009 economic crisis, total waste generation in Slovenia has been increasing again since 2012. In 2019, Slovenia generated approximately 8.4 million tonnes of waste, an 88% increase compared to 2012, when the lowest recorded waste generation was observed due to changes in reporting methodology and a decline in reported construction

waste volumes. Until 2013, data on municipal waste included only waste collected through public service providers. In 2023, Slovenia generated just under 11.4 million tonnes of waste, exceeding the 9.4 million tonnes recorded in 2021 but falling by almost 3% compared to 2022. This decline was primarily driven by a reduction in construction waste, which continued to account for three-quarters of total waste generation. The sharpest decline was observed in waste from the leather and steel industries, while wood waste increased by 27%. In 2023, municipal waste accounted for 10% of total waste generation, representing a 5% increase compared to 2022. On average, 518 kg of municipal waste was generated per capita, 22 kg more than in 2022. More than one-quarter of municipal waste consisted of mixed municipal waste, followed by paper and cardboard, and biodegradable waste. The municipal waste recycling rate reached almost 60% in 2023, slightly below the 2022 level, but marking significant progress compared to 2010, when only 22.4% of municipal waste was recycled. The largest increases in waste generation were recorded for bulky waste and wood waste, largely due to the impact of severe floods.

In 2023, approximately 363,000 tonnes of waste were disposed of, with more than half sent to landfill. Among landfilled waste, municipal waste accounted for 41%, followed by waste from mechanical treatment processes, other waste, and construction waste.

## II.A.13 Institutional arrangements to track progress

61. Each Party shall provide information on the institutional arrangements in place to track progress made in implementing and achieving its NDC under Article 4, including those used for tracking internationally transferred mitigation outcomes, if applicable, along with any changes in institutional arrangements since its most recent biennial transparency report.

The EU's Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action ('Governance Regulation')[8] establishes a governance mechanism and specific arrangements to track the progress of the Union and its Member States towards the implementation and achievement of the EU's climate and energy targets and commitments under the UNFCCC and the Paris Agreement. These arrangements include the monitoring of GHG emissions and removals, the reporting of policies and measures, projections of GHG emissions and removals and progress on adaptation to climate change.

Under the Governance Regulation, the EU has established a Union Inventory System to ensure the timeliness, transparency, accuracy, consistency, comparability and completeness of the data reported by the EU and its Member States. This inventory system includes a quality assurance and quality control programme, procedures for setting emission estimates, and comprehensive reviews of national inventory data to enable the assessment of compliance towards climate goals.

Each EU Member State compiles its GHG inventory in accordance with the requirements of the Paris Agreement[9] and the relevant Intergovernmental Panel on Climate Change (IPCC) guidelines[10]. Inventory data on GHG emissions and removals, including information on methods, are submitted electronically using a reporting system managed by the European Environment Agency (EEA). The submitted data are subject to quality control procedures and feed into the compilation of the GHG inventory of the EU. Net GHG emissions, calculated from emissions and removals reported in the GHG inventory of the EU, are the key information used

[8] Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, http://data.europa.eu/eli/reg/2018/1999/oj.

[9] Chapter II of the annex to decision 18/CMA.1, https://unfccc.int/documents/193408; and decision 5/CMA.3, https://unfccc.int/documents/460951.

[10] 2006 IPCC Guidelines for National GHG Inventories, https://www.ipcc-nggip.iges.or.jp/public/2006gl/; and on a voluntary basis: 2019 Refinement to the 2006 IPCC Guidelines for National GHG Inventories, https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/.

for tracking progress towards the EU NDC target of a least -55% net emission reduction by 2030 compared to 1990.

Given the scope of the EU NDC related to international aviation and navigation, a specific share of international aviation and navigation emissions as reported in the GHG inventory data is calculated based on the Joint Research Centre's Integrated Database of the European Energy System (JRC-IDEES)[11]. Details on the methodology applied to identify GHG emissions from international aviation and navigation in the scope of the EU NDC, which are added to the national totals from the EU GHG inventory, are given in Annex 2 to this BTR.

Under the Governance Regulation each Member State must report to the Commission biennially on the status of implementation of its integrated national energy and climate plans (NECPs). This process allows the Commission to ensure that the EU and the Member States remain on track to achieve the climate-neutrality objective and progress on adaptation. Under the Governance Regulation, Member States further operate national systems for policies and measures and projections and submit and report standardised information, which is subject to quality and completeness checks. Based on the submitted data, the EEA compiles projections of GHG emissions and removals for the EU. The EU-wide information is summarised annually in the Climate Action Progress Report[12] by the European Commission and in the 'Trends and projections' report by the EEA.[13] Both the Union and the national systems are subject to continuous improvements.

The national energy and climate plans (NECPs) were introduced by the Governance Regulation. For Member States, the NECP for 2021-2030 play a key role to enabling the tracking of progress towards the 2030 climate and energy targets. The update of the NECPs provides an opportunity for Member States to assess their progress, identify gaps and revise existing measures or plan new ones where needed.
Member States were due to submit their final updated NECPs, taking account of the Commission's assessment and recommendations, by 30 June 2024.

**Slovenia**

EARS is the competent authority responsible for the preparation of GHG emission inventories in Slovenia. In this role, EARS cooperates with a range of institutions and administrative bodies that provide activity data and other relevant information required for the development of the inventories. The institutional arrangements of the national inventory system are described in detail in NID.[14]

The main authority responsible for monitoring the achievement of climate targets and for the national system for tracking the implementation of climate policy is the ministry responsible for climate matters, currently MECE The system for monitoring the achievement of climate policy targets is integrated into the broader system for monitoring and implementing climate policy, which is described in detail in the chapter on measures and in Slovenia's BR5/NC8 report.[15] Responsibility for this system lies with the Climate Policies Directorate at MECE. Monitoring of target achievement is currently carried out in accordance with the Environmental Protection Act, which governs the monitoring of environmental policies, and with Regulation (EU)

[11] European Commission, Joint Research Centre, Rózsai, M., Jaxa-Rozen, M., Salvucci, R., Sikora, P., Tattini, J. and Neuwahl, F., JRC-IDEES-2021: the Integrated Database of the European Energy System – Data update and technical documentation, Publications Office of the European Union, Luxembourg, 2024, https://publications.jrc.ec.europa.eu/repository/handle/JRC137809.
[12] Climate Action Progress Report 2024, https://climate.ec.europa.eu/document/download/d0671350-37f2-4bc4-88e8-088d0508fb03_en?filename=COM_2024_498_F1_REPORT_FROM_COMMISSION_EN_V4_P1_3729454.PDF
[13] Trends and Projections in Europe 2024, https://www.eea.europa.eu/en/analysis/publications/trends-and-projections-in-europe-2024https://www.eea.europa.eu/en/newsroom/news/eea-trends-and-projections
[14] The National Inventory Document (NID), which reports on anthropogenic GHG emissions, is available on the UNFCCC website.
[15] https://unfccc.int/documents/626622

2018/1999. A Climate Law is currently in preparation, which will upgrade the existing legal framework and further formalise the current monitoring system. In addition, the Energy Directorate at MECE also monitors the achievement of climate targets within the framework of monitoring and reporting on the implementation of the National Energy and Climate Plan (NECP). The implementation of these responsibilities is coordinated between the two directorates and carried out in cooperation with other competent ministries.

The system for monitoring the implementation of climate policy also includes the Report on the Assessment of Target Achievement[16], which summarises all key findings related to progress in reducing GHG emissions, improving energy efficiency, and increasing the share of renewable energy sources (RES) in gross final energy consumption. The report also provides an overview of the financing of mitigation measures, a presentation of indicators and qualitative assessments regarding the achievement of their targets and the long-term management of emissions, as well as the energy and climate targets for 2030 and 2050. Each year, the report is supported by the Target Achievement Indicators[17] published as part of the Climate Mirror[18] indicator set, available on the EARS website.

## II.A.14 Arrangements for implementation, monitoring, reporting, archiving of information and stakeholder engagement

62. Each Party shall provide information on legal, institutional, administrative and procedural arrangements for domestic implementation, monitoring, reporting, archiving of information and stakeholder engagement related to the implementation and achievement of its NDC under Article 4.

The EU and its Member States have set up a comprehensive system for the implementation of the EU climate change mitigation targets. The European Climate Law[46] sets the goal of climate neutrality by 2050 and the intermediate target of reducing net GHG emissions by at least 55% by 2030 compared to 1990 levels. These targets cover emissions and removals that are regulated in the Union law.

To ensure that the EU and its Member States achieve their target, the 2030 Climate and Energy Framework was put in place. The main policies of this framework are EU ETS[19], which caps GHG emissions in energy, industry, aviation and maritime transport; the LULUCF Regulation which includes national net removal targets for the LULUCF sector; and the Effort Sharing Regulation (ESR) which establishes national reduction targets for GHG emissions not covered by the EU ETS or the LULUCF Regulation i.e. domestic transport (excluding aviation), buildings, agriculture, small industry and waste. The implementation of the ESR is supported by additional sectoral policies and measures (details can be found in this BTR in the chapter on mitigation policies and measures). The legislative acts under the 2030 Climate and Energy Framework require the European Commission and the EU Member States to set up the institutional arrangements for implementing the specific policies and measures.

The revised EU ETS Directive increases the level of ambition in the existing system from 43% to 62% emissions reductions by 2030, compared to 2005 levels and extend the system to also apply to international maritime transport. A separate carbon pricing system will apply to fuel combustion in road transport and buildings and small-emitting sectors (ETS2) with a 42% emission reduction target compared to 2005 across the sectors covered. The amended ESR increased, for the sectors that it covers, the EU-level GHG emission reduction target from 29% to 40% by 2030, compared to 2005, which translates in updated 2030 targets for

[16] https://podnebnapot2050.si/wp-content/uploads/2022/06/PO2022_Zvezek1_Cilji_KON_2022-06-15F.pdf
[17] https://kazalci.arso.gov.si/sl/teme/po-doseganje-ciljev
[18] https://kazalci.arso.gov.si/index.php/sl/teme/podnebno-ogledalo
[19] 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).

each Member State. The new LULUCF Regulation sets an overall EU-level objective of 310 Mt $CO_2$ equivalent of net removals in the LULUCF sector in 2030.

The ESR sets national targets for the reduction of GHG emissions in the Member States by 2030. Member States are also subject to gradually decreasing annual emission limits for each year from 2021 to 2030. The annual progress towards the national targets under the Effort Sharing Legislation is assessed by comparing GHG emission levels from the sectors covered by the ESR with the relevant annual emission allocations under the legislation (AEAs). To achieve compliance under the ESR, Member States are permitted to use flexibility options to a certain extent.

Progress in the implementation of these policies and measures is monitored under the Governance Regulation. Relevant information which is reported regularly and archived at the EEA include GHG inventories, approximated GHG inventories for the previous year, information on policies and measures, projections, and progress towards the implementation of integrated National Energy and Climate Plans (NECP). This information helps the EU and its Member States to correct their course if progress towards the targets of the 2030 Climate and Energy Framework is behind schedule. As an example, the European Commission assesses the drafts of new or updated NECPs and provides recommendations for improved planning and implementation. In addition, the reported information is subject to quality checks, and the GHG inventories reported by EU Member States are subject to comprehensive reviews in 2025, 2027 and 2032.[20]

All EU legislation, including the legislation under the 2030 Climate and Energy Framework, is subject to a stakeholder engagement process. So-called 'better regulation tools' ensure that policy is based on evidence and the best available practice[21]. During the preparation of legislative proposals, the European Commission invites citizens, businesses and stakeholder organisations to provide their views on the subject of the new legislation. These comments are documented in a dedicated portal[22], and the European Commission reports on how it takes these comments into account in the development of the legislative proposals. Furthermore, the Governance Regulation sets requirements for Member States to ensure that the public is given early and effective opportunities to participate in the preparation of the NECPs.

**Slovenia**

The primary authority responsible for the implementation and monitoring of climate policy in Slovenia is the ministry responsible for climate affairs, currently MECE. MECE is tasked with developing and overseeing key strategic documents and policy directions related to climate change mitigation and adaptation, the reduction of GHG emissions and other air pollutants, and the fulfilment of Slovenia's international obligations in this field. Within MECE, these responsibilities are carried out by the Climate Policies Directorate, except for the preparation, monitoring, and reporting on the NECP, which falls under the remit of the Energy Directorate. The implementation of these responsibilities is coordinated between the two directorates.

MECE also collaborates with other ministries and institutions responsible for implementing specific measures or policies when monitoring the execution of climate policies and actions. The institutional framework is outlined in Slovenia's BR5/NC8 report[23]. Since the last reporting cycle, a government reorganisation in early 2023 resulted in structural changes. The

[20] Consolidated text (2023) of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, https://eur-lex.europa.eu/eli/reg/2018/1999/2023-11-20.
[21] Decision-making process, https://ec.europa.eu/info/strategy/decision-making-process/how-decisions-are-made_en.
[22] Have your say – Public consultation and feedback, https://ec.europa.eu/info/law/better-regulation/have-your-say_en.
[23] https://unfccc.int/documents/626622

restructured MECE now integrates competencies in climate policy (Climate Policies Directorate), environmental protection (Environment Directorate), energy (Energy Directorate), and, to some extent, transport (Transport Policy Directorate), which is responsible for sustainable mobility, transport policy, and public transport. Other competencies remain unchanged. All relevant ministries continue to cooperate with MECE's Climate Policies Directorate in monitoring the implementation of climate policies.

Slovenia has established a system for monitoring the implementation of climate policies and measures, through which the Ministry and the government assess progress towards emission reduction targets, sectoral developments based on key indicators, the implementation of measures, and financial data. The monitoring system also includes recommendations for improving measures, allowing for adjustments where necessary. A detailed description of the monitoring system is provided in Slovenia's BR5/NC8 report.[24] The results of this monitoring have also served as an important reference point for updating the NECP. In preparation for the NECP update, a report on the implementation of NECP in Slovenia[25] was drafted in 2022, in accordance with a decision by the National Assembly's Committee on Infrastructure, the Environment, and Spatial Planning.

Monitoring progress in policy implementation relies on key reporting tools and indicators. These reports contain analytical assessments of target achievements, catalogued records on the implementation of specific instruments, and comprehensive financial and other overviews. They also provide recommendations for enhancing policy measures. In addition to a report, a range of indicators is available to track progress towards targets and the implementation of climate change mitigation measures across sectors such as transport, buildings, agriculture, LULUCF, and other sectors, including cross-sectoral measures. Slovenia regularly monitors fossil fuel subsidies as part of its cross-sectoral indicators, as these run counter to the objectives of reducing GHG emissions. The results of this monitoring were taken into account in setting targets and measures during the revision of the NECP.

In accordance with the provisions of Article 145 of the Environmental Protection Act (ZVO-2)[26], the Government of the Republic of Slovenia established the Climate Council, an independent national scientific advisory body for climate policy. The Climate Council began its regular work in autumn 2023 and has held twelve sessions to date, reviewing all key government proposals related to climate change. These include the draft NECP, proposals for the Climate Act, the Energy Act, the emergency act on TEŠ 6, as well as issuing its position on environmentally harmful subsidies and other current topics. The tasks and composition of the Climate Council are described in greater detail in Slovenia's BR5/NC8 report.[27]

Monitoring of policy implementation is currently carried out in accordance with the Environmental Protection Act, which regulates the monitoring of environmental policies. A Climate Act is currently being developed to strengthen the existing legal framework and further formalise the monitoring system.

| 63. In reporting the information referred to in paragraphs 59–62 above, a Party may reference previously reported information. |
|---|

[24] https://unfccc.int/documents/626622
[25] Poročilo o izvajanju Celovitega nacionalnega energetskega in podnebnega načrta,
[26] Zakon o varstvu okolja (ZVO 2)/Environmental Protection Act (ZVO-2) - http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO8286
[27] https://unfccc.int/documents/626622

## II.B Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates

64. Each Party shall provide a description of its NDC under Article 4, against which progress will be tracked. The information provided shall include the following, as applicable, including any updates to information previously provided:
(a) Target(s) and description, including target type(s) (e.g. economy-wide absolute emission reduction, emission intensity reduction, emission reduction below a projected baseline, mitigation co-benefits of adaptation actions or economic diversification plans, policies and measures, and other);
(b) Target year(s) or period(s), and whether they are single-year or multi-year target(s);
(c) Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s);
(d) Time frame(s) and/or periods for implementation;
(e) Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases;
(f) Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs under Article 4 of the Paris Agreement;
(g) Any updates or clarifications of previously reported information (e.g. recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches).

Under their updated NDC[28] the EU and its Member States, acting jointly, are committed to a legally binding target of a domestic reduction of net GHG emissions by at least 55% compared to 1990 by 2030. The term 'domestic' means without the use of international credits.

The NDC consists of a single-year target, and the target type is 'economy-wide absolute emission reduction'. The scope of the NDC covers the 27 Member States of the EU.

The 17 October 2023 updated NDC scope is supplemented by additional information to clarify the precise amount of international aviation and maritime emissions which are covered under the EU NDC. Details on the EU NDC can be found in table below**Error! Reference source not found.**(Table 2) and in the annex.

| Information | Description |
|---|---|
| Target and description | Economy-wide net domestic reduction of at least 55% in GHG emissions by 2030 compared to 1990. The term 'domestic' means without the use of international credits. |
| Target type | Economy-wide absolute emission reduction. |
| Target year | 2030 (single-year target) |
| Base year | 1990 |
| Base year value | Net GHG emissions level in 1990: 4 699 405 kt $CO_2$eq. |
| Implementation period | 2021-2030 |
| Geographical scope | EU Member States (Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden) including EU outermost regions (Guadeloupe, French Guiana, Martinique, Mayotte, Reunion, Saint Martin (France), Canary Islands (Spain), Azores and Madeira (Portugal)). |
| Sectors | Sectors as contained in Annex I to decision 5/CMA.3: Energy, Industrial processes and product use, Agriculture,LULUCF, Waste.<br>***International Aviation:*** Emissions from civil aviation activities as set out for 2030 in Annex I to the EU ETS Directive are included only in respect of $CO_2$ emissions from flights subject to effective carbon pricing through the EU ETS. With respect to the geographical scope of the NDC these comprise emissions in 2024-26 from flights between the EU Member States and departing flights to Norway, Iceland, Switzerland and the United Kingdom. |

[28] The update of the nationally determined contribution of the European Union and its Member States, https://unfccc.int/sites/default/files/NDC/2023-10/ES-2023-10-17%20EU%20submission%20NDC%20update.pdf.

| Information | Description |
|---|---|
| | ***International maritime Navigation:*** waterborne maritime navigation is included in respect of $CO_2$, methane ($CH_4$) and nitrous oxide ($N_2O$) emissions from maritime transport voyages between the EU Member States. |
| Gases | $CO_2$, $CH_4$, $N_2O$, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride ($SF_6$), nitrogen trifluoride ($NF_3$) |
| LULUCF categories and pools | The included LULUCF categories and pools are as defined in decision 5/CMA.3. |
| Intention to use cooperative approaches | The EU's at least 55% net reduction target by 2030 is to be achieved through domestic measures only, without contribution from international credits.<br>The EU will account and report for cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA. |
| Any updates or clarifications of previously reported information, as applicable | The information on the NDC scope contains clarifications/further details compared to the information provided in the updated NDC of the EU. |

***Table 2: Description of the NDC of the EU***

Note: This table is identical to table 'Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates,' which has been submitted electronically together with this BTR. This table is also annexed to this BTR.

Source: Updated NDC of the EU[29]

## II.C Information necessary to track progress made in implementing and achieving nationally determined contributions under Article 4 of the Paris Agreement

65. Each Party shall identify the indicator(s) that it has selected to track progress towards the implementation and achievement of its NDC under Article 4. Indicators shall be relevant to a Party's NDC under Article 4 and may be either qualitative or quantitative.
66. These indicators could include, as appropriate, for example: net GHG emissions and removals, percentage reduction of GHG intensity, relevant qualitative indicators for a specific policy or measure, mitigation co-benefits of adaptation actions and/or economic diversification plans or other (e.g. hectares of reforestation, percentage of renewable energy use or production, carbon neutrality, share of non-fossil fuel in primary energy consumption and non-GHG related indicators).
67. Each Party shall provide the information for each selected indicator for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), and shall update the information in accordance with any recalculation of the GHG inventory, as appropriate.
68. Each Party shall provide the most recent information for each selected indicator identified in paragraph 65 above for each reporting year during the implementation period of its NDC under Article 4.
69. Each Party shall compare the most recent information for each selected indicator with the information provided pursuant to paragraph 67 above to track progress made in implementing its NDC under Article 4.
70. For the first biennial transparency report that contains information on the end year or end of the period of its NDC under Article 4, each Party shall provide an assessment of whether it has achieved the target(s) for its NDC under Article 4 based on the relevant information described in paragraphs 59–69 above and paragraph 78 below, as applicable, and the most recent information for each

[29] The update of the nationally determined contribution of the European Union and its Member States, https://unfccc.int/sites/default/files/NDC/2023-10/ES-2023-10-17%20EU%20submission%20NDC%20update.pdf.

selected indicator relevant to tracking progress towards the implementation and achievement of its NDC under Article 4.
71. For the first NDC under Article 4, each Party shall clearly indicate and report its accounting approach, including how it is consistent with Article 4, paragraphs 13 and 14 of the Paris Agreement. Each Party may choose to provide information on accounting of its first NDC consistent with decision 4/CMA.1.
72. For the second and subsequent NDC under Article 4, each Party shall provide information referred to in chapter III.B and C above consistent with decision 4/CMA.1. Each Party shall clearly indicate how its reporting is consistent with decision 4/CMA.1.
73. Each Party shall provide any definitions needed to understand its NDC under Article 4, including those related to each indicator identified in paragraph 65 above, those related to any sectors or categories defined differently than in the national inventory report, or the mitigation co-benefits of adaptation actions and/or economic diversification plans.
74. Each Party shall provide a description of each methodology and/or accounting approach used, as applicable for: (a) Target(s), as described in paragraph 64 above; (b) The construction of baselines, as described in paragraph 64 above, to the extent possible; (c) Each indicator identified in paragraph 65 above.
75. The information referred to in paragraph 74 above shall include, as applicable and available to the Party's NDC under Article 4: (a) Key parameters, assumptions, definitions, data sources and models used; (b) IPCC guidelines used; (c) Metrics used; (d) Where applicable to its NDC, any sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, including as applicable: (i) The approach used to address emissions and subsequent removals from natural disturbances on managed lands; (ii) The approach used to account for emissions and removals from harvested wood products; (iii) The approach used to address the effects of age-class structure in forests; (e) Methodologies used to estimate mitigation co-benefits of adaptation actions and/or economic diversification plans; (f) Methodologies associated with any cooperative approaches that involve the use of internationally transferred mitigation outcomes towards its NDC under Article 4, consistent with CMA guidance on cooperative approaches under Article 6; (g) Methodologies used to track progress arising from the implementation of policies and measures; (h) Any other methodologies related to its NDC under Article 4; (i) Any conditions and assumptions relevant to the achievement of its NDC under Article 4.
76. Each Party shall also: (a) Describe, for each indicator identified in paragraph 65 above, how it is related to its NDC under Article 4; (b) Explain how the methodology in each reporting year is consistent with the methodology or methodologies used when communicating the NDC; (c) Explain methodological inconsistencies with its most recent national inventory report, if applicable; (d) Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed in relation to Article 6, if relevant.
77. Each Party shall provide the information referred to in paragraphs 65–76 above in a structured summary to track progress made in implementing and achieving its NDC under Article 4, including:
(a) For each selected indicator: (i) Information for the reference point(s), level(s), baseline(s), base year(s), or starting point(s) referred to in paragraph 67 above; (ii) Information for previous reporting years during the implementation period of its NDC under Article 4, identified in paragraph 68 above, as applicable; (iii) The most recent information identified in paragraph 68 above;
(b) Where applicable, information on GHG emissions and removals consistent with the coverage of its NDC under Article 4

## II.C.1 Indicator

For the tracking of progress towards implementing and achieving the NDC of the EU, an indicator is used which has the same unit and metric as the NDC base year and target values. The chosen indicator is 'annual total net GHG emissions consistent with the scope of the NDC in $CO_2$eq'. Table 3 provides more information on this indicator.

| Information | Description |
|---|---|
| Selected indicator | Annual total net GHG emissions consistent with the scope of the NDC in $CO_2$eq. |

| Information | Description |
|---|---|
| Reference level and base year | The reference level is total net GHG emissions of the EU in the base year (1990). The reference level value for the EU is 4 699 405 kt $CO_2$eq. |
| Updates | This is the first time the reference level is reported, hence there are no updates.<br>The value of the reference level may be updated in the future due to methodological improvements to the EU GHG inventory and to the determination of international aviation and navigation emissions in the NDC scope. |
| Relation to the NDC | The indicator is defined in the same unit and metric as the target of the NDC. Hence it can be used directly for tracking progress in implementing and achieving the NDC target. |
| Definitions | Definition of the indicator 'annual total net GHG emissions in $CO_2$eq':<br>Total net GHG emissions correspond to the annual total of emissions and removals reported in CO2 equivalents in the latest GHG inventory of the EU. The totals comprise all sectors and gases listed in the table entitled 'Reporting format for the description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates.' Indirect CO2 emissions are included from those Member States that report these emissions. |

***Table 3: Indicator for tracking progress***

Note: The information in this table is identical to the information in Common tabular format (CTF) tables 1 ('Description of selected indicators') and 2 ('Definitions needed to understand the NDC'), which were submitted electronically together with this BTR.

Source: The reference level is based on the Annual European Union GHG inventory 1990-2022.

## II.C.2 Methodologies and accounting approach

The EU use the following accounting approach for tracking progress towards the joint EU NDC: annual GHG data from the national GHG inventory of the EU, complemented for international aviation and navigation with estimations from the Joint Research Centre's Integrated Database of the European Energy System[30]. The total net GHG emissions are provided in the scope of the EU NDC and are compared to the economy-wide absolute emission reduction target as defined in the NDC. The EU will account for its cooperation with other Parties in a manner consistent with guidance adopted by the CMA.

As far as emissions and removals from the LULUCF sector are concerned, net emissions are used for tracking progress towards the 2030 target of the NDC based on all reported emissions and removals.

Details on methodologies and accounting approaches consistent with the accounting guidance[31] under the Paris Agreement can be found in CTF table 3 ('Methodologies and accounting approaches'), which was submitted electronically together with this BTR.

## II.C.3 Structured summary – status of progress

An important purpose of the BTR is to demonstrate where the EU and its Member States stand in implementing their NDC, and which progress they have made towards achieving it. The most recent information on GHG emissions and removals in the scope of the NDC constitutes the key information for tracking this progress. Table 4 summarises the current status of progress.

[30] European Commission, Joint Research Centre, Rózsai, M., Jaxa-Rozen, M., Salvucci, R., Sikora, P., Tattini, J. and Neuwahl, F., JRC-IDEES-2021: the Integrated Database of the European Energy System – Data update and technical documentation, Publications Office of the European Union, Luxembourg, 2024, https://publications.jrc.ec.europa.eu/repository/handle/JRC137809.

[31] Decision 4/CMA.1, Further guidance in relation to the mitigation section of decision 1/CP21, https://unfccc.int/documents/193407.

| | Unit | Base year value | Values in the implementation period | | | Target level | Target year | Progress made towards the NDC |
|---|---|---|---|---|---|---|---|---|
| | | | 2021 | 2022 | 2030 | | | |
| Indicator: Total net GHG emissions consistent with the scope of the EU NDC | kt $CO_2$eq | 4 699 405 | 3 272 650 | 3 205 223 | NA | (at least 55% below base year level) | 2030 | The most recent level of the indicator is 31.8 % below the base year level. |

***Table 4: Summary of progress towards implementing and achieving the NDC***

NA: Not Applicable.

Note that an annual emissions balance consistent with chapter III.B (Application of corresponding adjustment) will be provided in a subsequent BTR upon finalisation of relevant further guidance by the CMA, based on the annual information reported under Article 6.2.

Note: More detailed information can be found in CTF Table 4 ('Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreement'), which has been submitted electronically together with this BTR.

Source: The indicator values are based on the Annual European Union GHG inventory 1990-2022.

Based on the GHG inventory data and data on international aviation and navigation for 2022, the EU and its Member States reduced net GHG emissions by 31.8 % compared to 1990. The EU and its Member States made progress towards implementing and achieving their NDC. The legal and institutional framework is in place to make further progress in the years ahead and to achieve the NDC target by 2030.

78. Each Party with an NDC under Article 4 that consists of adaptation actions and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement shall provide the information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures, including: (a) Sectors and activities associated with the response measures; (b) Social and economic consequences of the response measures; (c) Challenges in and barriers to addressing the consequences; (d) Actions to address the consequences.

Not applicable.

79. Each Party shall report the information referred to in paragraphs 65–78 above in a narrative and common tabular format, as applicable. Such common tabular formats should accommodate all types of NDC under Article 4, as appropriate.

See above.

## II.D. Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement

80. Each Party shall provide information on actions, policies and measures that support the implementation and achievement of its NDC under Article 4 of the Paris Agreement, focusing on those that have the most significant impact on GHG emissions or removals and those impacting key categories in the national GHG inventory. This information shall be presented in narrative and tabular format.

81. To the extent possible, Parties shall organize the reporting of actions by sector (energy, transport, industrial processes and product use, agriculture, LULUCF, waste management and other).
82. Each Party shall provide the following information on its actions, policies and measures, to the extent possible, in a tabular format: (a) Name; (b) Description; (c) Objectives; (d) Type of instrument (regulatory, economic instrument or other); (e) Status (planned, adopted or implemented); (f) Sector(s) affected (energy, transport, industrial processes and product use, agriculture, LULUCF, waste management or other); (g) Gases affected; (h) Start year of implementation; (i) Implementing entity or entities.
83. Each Party may also provide the following information for each action, policy and measure reported: (a) Costs; (b) Non-GHG mitigation benefits; (c) How the mitigation actions as identified in paragraph 80 above interact with each other, as appropriate.
84. For each Party with an NDC under Article 4 of the Paris Agreement that consists of mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans consistent with Article 4, paragraph 7, information to be reported under paragraphs 80, 82 and 83 above includes relevant information on policies and measures contributing to mitigation co-benefits resulting from adaptation actions or economic diversification plans.
85. Each Party shall provide, to the extent possible, estimates of expected and achieved GHG emission reductions for its actions, policies and measures in the tabular format referred to in paragraph 82 above; those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to report this information.
86. Each Party shall describe the methodologies and assumptions used to estimate the GHG emission reductions or removals due to each action, policy and measure, to the extent available. This information may be presented in an annex to its biennial transparency report.
87. Each Party should identify those actions, policies and measures that are no longer in place compared with the most recent biennial transparency report and explain why they are no longer in place.
88. Each Party should identify its actions, policies and measures that influence GHG emissions from international transport.
89. Each Party should, to the extent possible, provide information about how its actions, policies and measures are modifying longer-term trends in GHG emissions and removals.
90. Each Party is encouraged to provide detailed information, to the extent possible, on the assessment of economic and social impacts of response measures.

## II.D.1 Cross-sectoral measures

### M-1 EU EMISSIONS TRADING SCHEME (EU ETS1)

**Sectors affected by the implementation of the measure:** electricity and heat production; energy use in industry and construction; industrial processes

The EU ETS aims to enable companies to reduce GHG emissions at the lowest possible cost by allowing reductions where they are most cost-effective. It also seeks to harmonise the cost of emission reductions across the EU through cross-border trading, thereby minimising competitive distortions and preventing discrimination against companies (i.e., operators of GHG-emitting installations) within the EU single market. The system further contributes to future emission reductions by incentivising innovation in emission abatement technologies.

The overarching goal is to support Member States in meeting their GHG emission reduction commitments in a cost-effective manner, minimising the financial burden on industrial operators considered major emitters or whose production processes require GHG emission permits. The system constitutes implementation of the EU acquis, including Directive 2003/87/EC, Directive 2008/101/EC, Directive 2009/29/EC, and implementing acts 2010/2/EU, 2011/278/EU, 2011/638/EU, 176/2014/EU, and Decision (EU) 2015/1814. In Slovenia, the system is transposed through the Environmental Protection Act and related implementing regulations.

Responsibility for implementation lies with the ministry responsible for climate policy[32], which

[32]At the time of reporting, this responsibility was held by MECE.

ensures enforcement of the relevant provisions of the Environmental Protection Act concerning emissions trading. The EU is responsible for designing the system.

During the 2013–2020 period, a total of 49 operators in Slovenia participated in the EU ETS, including operators of all thermal power plants and district heating facilities (Termoelektrarna Šoštanj (Šoštanj Thermal Power Plant), Termoelektrarna Brestanica (Brestanica Thermal Power Plant), Energetika Ljubljana), as well as operators in the production of steel, glass, ceramics, cement, lime, paper, and similar industries. Between 2021 and 2025, 34 operators have been included in the system.

In the fourth phase (2021–2030), the number of free allowances is being reduced at an annual rate of 2.2% until 2025. The revised EU ETS Directive (2023) raised the ambition level of the existing system, increasing the 2030 emissions reduction target from 43% to 62% compared to 2005 levels. Consequently, the linear reduction factor rises to 4.3% for the 2024–2027 period and to 4.4% for 2028–2030. At the same time, the number of sectors classified as being at risk of so-called "carbon leakage" was further reduced, as companies may relocate production and emit GHGs elsewhere in response to stricter emission limits. Companies in sectors deemed at risk of carbon leakage are entitled to receive approximately 70% of their required allowances free of charge annually, decreasing to around 50% by the end of 2030. For companies in sectors not considered at risk of carbon leakage, the share of freely allocated allowances is approximately 20% in the 2021–2025 period. This amount will decline linearly, with no free allowances granted beyond 2030.

Between 2005 and 2022, GHG emissions in the EU ETS sector in Slovenia decreased by 44%[33] — by 49% in the transformation sector and by 33% in fuel use and process-related industrial emissions. The EU ETS sector accounts for 31% of total national emissions.

| | Annual GHG Emissions and Removals | | | Change | |
|---|---|---|---|---|---|
| | 2005 | 2021 | 2022 | 2005-2022 | 2021-2022 |
| | kt $CO_2$ eq | | | % | |
| Emissions under the EU ETS | 8.738[33] | 5,682 | 4,861 | -44% | -14% |
| Electricity and heat production | 6,301 | 3,987 | 3,230 | -49% | -19% |
| Industry | 2,437 | 1,695 | 1,631 | -33% | -4% |
| *Share of EU ETS in total emissions* | 42% | 35% | 31% | | |
| Total emissions | 20,596 | 16,074 | 15,615 | -24% | -3% |

***Table 5: Overview of GHG emissions under the EU ETS in 2005, 2020, and 2022***

## M-2 EXPANSION OF THE EU ETS (ETS2 OR BRT)

**Sectors affected by the implementation of the measure:** energy use in buildings (households, service sector), transport, and industrial units not covered under ETS1

As part of the 2023 revision of EU ETS Directive, a new emissions trading system – ETS2 (EU ETS2) – was established across EU Member States. This new system is separate from the existing EU ETS. ETS2 will cover $CO_2$ emissions from fuel combustion in buildings, road transport, and additional sectors – primarily small and medium-sized enterprises (SMEs) in

[33] For the year 2005, a simulation was carried out to estimate emissions under the same activity scope as applied in 2022.

economic activities not covered by the current EU ETS. The current EU ETS applies to the energy sector and energy-intensive industrial processes. ETS2 will complement other policies under the European Green Deal in selected sectors, supporting Member States in meeting their emission reduction targets under ESR. Emission reductions in these sectors have so far been insufficient to put the EU firmly on track towards its 2050 climate neutrality goal. The carbon price introduced through ETS2 will thus provide a market-based incentive for investments in building renovation and low-emission mobility.

The ETS2 system will become fully operational in 2027. It will not apply at the level of end-users (i.e. households or vehicle users) but rather at a higher level of fuel suppliers who will be responsible for monitoring and reporting on emissions. These so-called regulated entities will be subject to ETS2, meaning they will be required to surrender a sufficient number of allowances to cover their emissions. Regulated entities will obtain allowances through auctions. The ETS2 cap will be set to ensure a 42% reduction in emissions by 2030 compared to 2005 levels.

All allowances under ETS2 will be auctioned, with part of the revenue allocated to supporting vulnerable households and micro-enterprises through a dedicated Social Climate Fund (SCF).

### M-3 ENVIRONMENTAL TAX ON AIR POLLUTION FROM CO2 EMISSIONS

**Sectors affected by the implementation of the measure:** energy use in industry and construction; energy use in other sectors (households, the service sector, and agriculture); and transport

The environmental tax instrument has been introduced with the aim of internalising the external costs of air pollution caused by $CO_2$ emissions and, as an economic instrument, is intended to influence the reduction of $CO_2$-related air pollution through a fuel price surcharge, and consequently contributes to reducing the overall environmental burden. The $CO_2$ tax improves the competitiveness of renewable energy sources and of other energy products with lower specific emissions, as well as the competitiveness of measures for efficient energy consumption.

The legal framework for the environmental tax on $CO_2$ emissions includes the Environmental Protection Act[34] and the Decree on the environmental tax on air pollution caused by carbon dioxide emissions[35]. The 2018 update of the Decree[36] introduced several changes; however, these focused primarily on improving implementation efficiency, ensuring consistency with the Excise Duty Act, and establishing a minimum fuel taxation rate. It was only in 2024 that the Decision on the rate of the environmental tax on $CO_2$ emissions[37] was adopted, increasing the tax from EUR 17.30 per tonne of $CO_2$ to EUR 30.85 per tonne.

As part of the 2024 update of NECP, the objective of this measure is to reform the environmental tax into a dedicated levy, which will gradually increase over time and become a key instrument for steering energy use in a more sustainable direction, based on the carbon intensity of energy sources. The measure also includes integration into the EU ETS2. In addition, the social dimension of the measure will be examined, with particular attention to its

[34] Environment Protection Act (Official Gazette of the Republic of Slovenia, Nos. 39/06 – official consolidated text , 49/06 – ZMetD, 66/06 – CC Decision, 33/07 – ZPNačrt, 57/08 – ZFO-1A, 70/08, 108/09, 108/09 – ZPNačrt-A, 48/12, 57/12, 92/13 , 56/15, 102/ 15, 30/16, 61/17 – GZ, 21/18 – ZNOrg and 84/18– ZIURKOE)

[35] Decree on environmental tax on air pollution caused by carbon dioxide emissions (Official Gazette of the Republic of Slovenia, No. 48/18).

[36] Decree on environmental tax on air pollution caused by carbon dioxide emissions (Official Gazette of the Republic of Slovenia, Nos. 48/18, 168/20, 44/22 - ZVO-2, 84/22, 104/22 and 118/22).

[37] Official Gazette of the Republic of Slovenia, No. 75/2024 2328. Decision on the rate of the environmental tax on $CO_2$ emissions: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2024-01-2328/sklep-o-visini-okoljske-dajatve-za-onesnazevanje-zraka-z-emisijo-ogljikovega-dioksida

impact on the most vulnerable households. The aim is to adjust supporting policies to address energy and mobility poverty and mitigate any adverse effects of the levy on these groups. $CO_2$ emission levies will be made purpose-bound in line with the EU ETS Directive, with revenues allocated to measures that reduce emissions and support the transition to a climate-neutral society.

Target groups include the most vulnerable households, which will receive support measures to address energy and mobility poverty, and fossil fuel users, who will be encouraged to shift towards sustainable energy sources. There is also a strong focus on strengthening the capacities of competent institutions, such as MECE, to ensure the effective implementation of transition-related measures.

The measure will operate in parallel with other initiatives promoting improvements in energy efficiency and fuel switching in the transport and building sectors. Exempt from the environmental tax are companies included in EU ETS1 and operators of small installations that have been excluded from EU ETS1 through an opt-out approved by the European Commission (i.e., holders of GHG emission permits), provided they meet the conditions set out in the Decree on environmental tax on air pollution caused by carbon dioxide emissions.

### M-4 TAXES AND LEVIES ON ENERGY CONTRIBUTING TO EMISSION REDUCTIONS

**Sectors affected by the implementation of the measure:** energy use in industry and construction; energy use in households, the service sector, and agriculture; and transport

In Slovenia, the taxation of energy products and electricity is governed by various taxes and levies, including excise duties, environmental taxes, and contributions for renewable energy sources and energy efficiency. The aim of the measure is to improve the competitiveness of renewable energy sources and fuels with lower environmental impacts, while internalising negative external costs into the prices of energy products and electricity. This supports sustainable development and the achievement of environmental objectives, while also ensuring a stable source of revenue for the national budget. All taxes and levies are described in more detail in Slovenia's Eighth National Communication and Fifth Biennial Report to the UNFCCC.

During the period of high energy and electricity prices, the Government of the Republic of Slovenia introduced several measures to mitigate the energy price crisis, including price regulation, non-repayable financial incentives, and temporary reductions in taxes and levies. From 1 September 2022 to 31 May 2023, a temporary reduction in value added tax (VAT) from 22% to 9.5% applied to the supply of electricity, natural gas, district heating, and firewood. In addition, the environmental tax on $CO_2$ emissions was temporarily suspended for gas oil, motor gasoline, light fuel oil (LFO), and natural gas between 21 June 2022 and 1 August 2022, and again between 13 September 2022 and 8 May 2023. In 2022 and 2023, there was also a temporary exemption from the RES+CHP contribution for motor gasoline and diesel fuel. In 2022, the government additionally suspended the collection of the energy efficiency contribution (EE) on these fuels[38]. These exemptions were gradually phased out, with the last ending in 2024.

### M-5 CHANGES TO THE ENVIRONMENTAL TAX, AND TO TAXES AND LEVIES

**Sectors affected by the implementation of the measure:** energy use in industry and construction; energy use in households, the service sector, and agriculture; and transport

In 2021, the European Commission prepared a proposal to restructure the Union framework for the taxation of energy products and electricity, which has not yet been adopted. For further

[38] https://www.energetika-portal.si/podrocja/energetika/ukrepi-za-omilitev-draginje-na-podrocju-energetike/naftni-derivati/

details, see EU BTR1.

In the field of excise duties, Slovenia has adopted the following measures aimed at limiting the use of fossil fuels: in 2024, an additional condition for claiming excise duty refunds for energy-intensive companies was introduced — compliance with the ISO standard — which will apply from 1 January 2026.

The 2024 NECP foresees a gradual increase in the energy efficiency contribution (URE) to EUR 0.27 c/kWh by 2030, with the aim of ensuring sufficient resources for the implementation of energy efficiency measures. A reform of fiscal incentives for businesses is also planned, including investment-related tax relief. The difference between general and green/digital transition-related reliefs is intended to be sufficiently attractive to encourage investment. In addition, the exemption system for contributions supporting electricity production from renewable energy sources (RES) and high-efficiency cogeneration (CHP) will also be upgraded. In addition, alternative approaches will be explored for gradually increasing excise duties on fossil fuels used for heating, and for introducing incentive-based excise duties for RES and low-carbon energy sources, with the aim of encouraging the shift towards sustainable energy. By 2027, when Slovenia is expected to join EU ETS2, the objective is to improve cost-efficiency, reduce $CO_2$ emissions, and support the achievement of the 2030 climate targets. Several measures under the NECP also address the management of incentives related to fossil fuel use (see corresponding measure M-11).

### M-6 USE OF BEST AVAILABLE TECHNIQUES – ENVIRONMENTAL PERMITS

**Sectors affected by the implementation of the measure:** industrial processes, energy use in industry and construction, transformations, waste, agriculture

Directive 2010/75/EU on industrial emissions is the key instrument regulating emissions of harmful substances, while the principal instrument for emissions from fuel use, as well as for promoting energy efficiency and fuel switching in industry, is EU ETS (MeasureM-1). Directive 2010/75/EU serves only as a complementary measure in this respect. The objective of the directive is to ensure the implementation of best available techniques (BAT) through environmental permits for installations and their supervision. It guides the selection of new installations and promotes the replacement of existing ones, as installations must comply with the conditions and provisions of the directive or with the standards set out in the reference documents. The directive also sets emission limit values for large combustion plants. It is complemented by other EU measures, such as the Directive on the reduction of national emissions of certain atmospheric pollutants (Directive (EU) 2016/2284).

In August 2024, a revised version of the directive entered into force, extending its scope to additional large pig and poultry farms, mining activities, and large-scale battery production.

### M-7 EDUCATION, TRAINING, AWARENESS RAISING, COMMUNICATION AND PROMOTION

**Sectors affected by the implementation of the measure:** all sectors

In Slovenia, a range of stakeholders (governmental and non-governmental sectors, the media, businesses, professional institutions, etc.) implement education, training, communication, and awareness-raising activities in the field of climate change mitigation. These activities are financed from multiple sources, including the state budget, EU funds, and various international funding mechanisms. They are implemented across all relevant sectors. In the updated NECP, the measures in this area have been revised and expanded. Key measures include:

- Communication and awareness raising for target groups (e.g., the transition to a climate-neutral society, sustainable mobility, energy efficiency in buildings, sustainable and nature-based food production and supply, food waste prevention, land use, land-use

change, and forestry). Under this measure, the activities within the LIFE IP Care4Climate project will be continued and enhanced, covering a wide range of topics. Following the conclusion of the project, targeted public communication and awareness-raising activities will continue — including awareness raising on lifestyle habits and green urban logistics — the central national online platform for sustainable mobility will be renovated, and the capacity of civil servants will be strengthened to support the transition to a low-carbon society. Additional content will be developed for the target group of industry and small and medium-sized enterprises. Awareness raising and education will be carried out for users of wood biomass appliances, installers of renewable energy systems and energy efficiency technologies, building managers, and energy managers. Targeted awareness raising and training will be carried out for specific professional groups on issues related to energy efficiency and renewable energy (e.g., fire fighters, paramedics, chimney sweeps). In 2024, the Ministry of the Environment, Climate and Energy conducted a major awareness campaign on renewable energy sources.

- Promotion of sustainable dietary practices (M36.5); this is a new, additional measure under the NECP, focusing on updated dietary guidelines, the promotion of food waste prevention, and the importance of local food.
- Planning and development of education and training to support the transition to a climate-neutral society and circular economy, with an emphasis on the necessary knowledge, skills, and quality employment opportunities (M33.6). This represents an upgrade of an existing measure, with numerous activities being implemented under the LIFE IP Care4Climate project.
- Promotion of training and human resource development in companies and institutions (M33.5): this represents an upgrade of an existing measure, under which a unified evaluation system and a methodology for assessing the impact of such training will also be developed. The measure also includes additional training for staff at competent ministries, public funds, and similar institutions on topics related to the green transition.

As already mentioned above, numerous training, education, awareness-raising, and promotional activities are being implemented within the framework of the LIFE IP Care4Climate project, which also led to the establishment of the website www.samo1planet.si. In the transport sector, a wide range of information is provide on a dedicated website – the Slovenian Mobility Platform for Sustainable Mobility, www.sptm.si. Within the low-carbon society framework, the pillar Smart, sustainable and inclusive growth also includes the measure Strengthening competences, with a particular focus on digital skills and those needed for emerging professions and the green transition. The Reform of the Education System for the Green and Digital Transition is listed as a reform, with the objective of equipping pupils and teachers with new competences, including those related to sustainable development. An allocation of EUR 4.42 million is foreseen for the implementation of this reform. As the second reform, the Reform of Higher Education for a Green and Resilient Transition is listed, with the objective of modernising professional higher education in line with the requirements of the green and digital transition. A total of EUR 2.02 million is available for the implementation of this reform.

### M-8 GREEN PUBLIC PROCUREMENT

**Sectors affected by the implementation of the measure:** energy use in the public sector, energy use in transport

The objective of the green public procurement (ZeJN) measure is to reduce the negative environmental impacts of the public sector – and thereby GHG emissions – by procuring goods, services and works that are less environmentally burdensome while offering equal or improved functional performance. This contributes to improving the environmental characteristics of the available supply, encourages the development of environmental innovation and the circular economy, and sets an example for the private sector and

consumers. Target groups include public authorities and contracting entities, suppliers and providers of public procurement services, ZeJN experts, and the broader public, including businesses and consumers. Key activities under the NECP 2024 include the establishment of a legal basis and funding mechanisms to support the expansion of ZeJN, the development of model documentation, guidelines and digital tools, regular training, mentoring, and expert support for contracting authorities. Emphasis is also placed on promoting ZeJN and the procurement of innovation, integrating sustainable and circular principles – such as product durability, recycling, and the use of sustainable materials – promoting sustainable mobility and the use of renewable energy sources, and implementing pilot projects for green innovation. The LIFE IP Care4Climate project also contributes to these efforts by providing training and capacity building for public procurers and other stakeholders, thereby increasing their awareness and knowledge of ZeJN implementation. The environmental, economic, and social impacts of ZeJN will be monitored on a regular basis. These measures will support emission reductions, more efficient use of resources, and the acceleration of the green transition in Slovenia.

This area is regulated by the Decree on green public procurement[39], which defines the categories of public procurement for which environmental aspects and the objectives of ZeJN are specified. Annex 1 of the Decree sets out 78 procurement categories for which public procurement is mandatory. For 22 of these, the inclusion of environmental aspects in the procurement process is compulsory. Annex 2 defines the objectives and conditions in the area of public procurement of clean and zero-emission vehicles for road transport. The Decree is currently undergoing revision.

In 2023, a total of 16,824 procurement contracts were awarded, with an estimated total value of EUR 6.23 billion. Of these, 4,804 contracts (worth EUR 2.14 billion) included at least one environmental aspect. In terms of GHG emission reductions, the most significant green public procurement contracts under ZeJN were for road vehicles, electricity, the design and/or construction of buildings, electric lamps and luminaires, indoor lighting, street lighting, and traffic signalling systems[40].

### M-9 ENERGY LABELLING AND MINIMUM STANDARDS

**Sectors affected by the implementation of the measure:** energy use in the public and service sectors, energy use in households, energy use in transport

The purpose of energy labelling is to enable consumers to purchase energy-efficient appliances, thereby contributing to reduced energy consumption and lower energy costs. The ecodesign of products, in addition to supporting environmental objectives, also aims to foster the development of a circular economy. Both measures are legislative in nature and have been implemented — with multiple upgrades — since 2002.

Since the 8th National Communication, a new directive on the ecodesign of products (the so-called Ecodesign Directive) has been adopted. It further expands the scope of ecodesign legislation, both by broadening the range of products covered and by increasing the number of requirements that products must meet. In parallel with the new legislation, the European Commission has adopted a new working plan on product ecodesign and labelling for the 2022–2024 period The plan foresees an expansion of the product categories covered and a higher level of ambition regarding the requirements applied to products.

[39]Decree on green public procurement (Official Gazette of the Republic of Slovenia, Nos. 51/17, 64/19 and 121/21)
[40] https://ejn.gov.si/novice/novica-85.html

### M-10 OBLIGATIONS OF ENERGY SUPPLIERS TO ACHIEVE ENERGY SAVINGS AMONG FINAL CONSUMERS

**Sectors affected by the implementation of the measure:** energy use in the public and private service sectors, households, industry and construction, and transport

This is a legislative measure requiring energy suppliers to achieve reductions in energy consumption and GHG emissions among final consumers by implementing various energy efficiency measures. In doing so, they contribute to the achievement of national targets in this area. The first mandatory energy savings scheme for companies selling energy was established in Slovenia in 2011. In 2015, it was replaced by a new scheme under which all suppliers of electricity, gas, and liquid and solid fuels to final consumers became obligated parties. As of the end of 2020, suppliers of solid fuels to final consumers are exempt from the scheme if they supply less than 100 MWh of energy annually. The operation of the scheme is governed by the Act on Energy Efficiency (ZURE)[41] and the Decree on energy savings requirements[42].

In accordance with NECP 2020[43] and subsequently updated in 2024 (NECP 2024)[44], the operation of the scheme is planned to continue at least until 2030. To achieve the required energy savings in line with Article 8 of the 2023 Energy Efficiency Directive (EED)[45] (Energy Savings Obligation), the scheme is complemented by an alternative measure, namely, the implementation of programmes by the Eco Fund, Borzen, and other publicly funded programmes promoting energy efficiency. The energy savings targets set out in NECP 2024 are aligned with the 2023 EED and amount to 0.8% for the period 2021–2023, 1.3% for 2024–2025, 1.5% for 2026–2027, and 1.9% for 2028–2030, calculated as a percentage of annual final energy consumption based on the average of the three years preceding 1 January 2019. The combined target for the scheme and the alternative measure for the 2021–2030 period is set at 7,849 GWh. The annual energy savings targets were exceeded in 2021, 2022, and 2023.

### M-11 MANAGEMENT OF FOSSIL FUEL SUBSIDIES

**Sectors affected by the implementation of the measure:** energy use in transport, industry, and agriculture

The measure is aimed at reducing fossil fuel consumption and supporting the transition to green technologies, with the objective of phasing out both direct and indirect subsidies for fossil fuel use. The measure foresees the following actions: the optimal phase-out of excise duty refunds for industrial and commercial purposes by no later than 2030; the introduction of legal restrictions on the provision of financial incentives for the installation of stand-alone fossil fuel boilers by 2025; and the gradual reduction of excise duty refunds on energy products used in industry by 2030. From 2025 onwards, eligibility for such refunds will be conditional on obtaining certification in accordance with ISO 50001 or ISO 14001 standards, or, alternatively, on the implementation of measures identified through mandatory energy audits with a payback period of up to four years. The measure also includes the preparation of an impact analysis concerning the phase-out of other direct and indirect subsidies for fossil fuel use, followed by the adoption of legal restrictions on granting additional subsidies for the use, distribution, and storage of fossil fuels. The target groups of the measure include industrial and commercial enterprises currently benefiting from excise duty refunds, as well as industrial operators who will be required to obtain ISO 50001 or ISO 14001 certification. The measure also applies to

[41] Official Gazette of the Republic of Slovenia, No. 158/20
[42] Official Gazette of the Republic of Slovenia, Nos. 96/14, 158/20 – ZURE, 84/22, 86/22 and 107/22
[43] https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/NECP/dokumenti/NECP_5.0_final_feb-2020.pdf
[44] https://www.energetikaportal.si/fileadmin/dokumenti/publikacije/NECP/dokumenti/NECP2024_final_dec2024.pdf
[45] Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast)

companies receiving other forms of support for fossil fuel use, as resources will be redirected towards green technologies and sustainable projects.

### M-12 NEW FINANCIAL INSTRUMENTS FOR THE TRANSITION TO A LOW-CARBON SOCIETY

**Sectors affected by the implementation of the measure:** energy use in broad consumption sectors (households, services), transport, energy supply

The NECP foresees the introduction of new and/or enhanced financial measures to support the transition to a low-carbon society.

It provides for the establishment of a financing model and implementing structure (NECP Measure 2024 M11.1) to address existing gaps in the institutional framework for the implementation of climate policies. The primary objective is to accelerate investments in energy efficiency (EE), renewable energy sources (RES), and GHG emissions reduction through the enhancement and/or integration of existing implementing structures. This will support the unified preparation, evaluation, and financing of projects; the concentration of expertise; the promotion of demonstration projects; and the capacity-building of key stakeholders. In this context, the provision of adequate human resources in institutions responsible for implementing climate policies is also envisaged, ensuring the effective delivery of an increased volume of measures and the sound management of associated public funds.
The measure includes the establishment of technical assistance programmes and/or technical offices within investment incentive schemes (grants and other financial instruments). These will provide support to investors across all relevant target groups – including local authorities and their utility and environmental public services, public sector actors, households (particularly multi-dwelling buildings), SMEs, and others. Support will be available for the high-quality preparation of projects – including the aggregation of small-scale or dispersed initiatives – as well as for achieving a high degree of blending of different financing sources, risk management, and related advisory services. These services will be organised at both national and regional levels. A specific measure includes grants for project preparation related to the low-carbon transition (M11.1a), aimed in particular at projects involving the energy renovation of public sector and multi-dwelling buildings, the improvement of district heating and cooling (DHC) system efficiency, the establishment of energy or RES communities, sustainable mobility, and other public EE and RES projects.

The NECP also foresees a measure to increase the capital of the Eco Fund (M11.3), with the goal of expanding the volume of repayable incentives over the long term, targeting building renovation and other environmental investments. The measure is already being implemented.

### M-13 MEASURES IN THE FIELD OF RESEARCH, INNOVATION AND COMPETITIVENESS FOR THE GREEN GROWTH OF THE ECONOMY

**Sectors affected by the implementation of the measure:** energy use in industry and construction; energy use in households, the services sector, agriculture, and transport

The measures in the field of research, innovation and competitiveness for the green growth of the economy were enhanced during the revision of the NECP. Key measures include:

- Promoting the development of high-quality green products, services and business models for decarbonisation and circularity through a combination of repayable and non-repayable funding (M11.2);
- Increasing funding for research and development to support the competitiveness of the Slovenian economy and the transition to a climate-neutral society, involving both a higher overall funding volume and more targeted allocation to areas contributing to the objectives of the green transition (M33.1);

- Supporting research, innovation, demonstration and pilot projects for the transition to a climate-neutral society (covering RES and EE technologies, other low-carbon technologies, energy storage, smart grids, recycling, material efficiency, enhancement of carbon removals and reduction of GHG emissions in the LULUCF and agriculture sectors, use of natural renewable materials, and others), implemented by state institutions, and including adaptation to climate change (M33.2);
- Incentivising companies and institutions to support the transition to a climate-neutral society (M33.3);
- Introducing new financial instruments and additional financial incentives for innovation and demonstration projects in the area of the green transition (M33.4);
- Promoting training and strengthening human resources capacity within companies and institutions (M33.5);
- Planning and developing education and training for the transition to a climate-neutral society and circular economy, with a focus on the required knowledge, competences and quality employment (M33.6);
- Upgrading key research infrastructures (M34.1);
- Two measures focused on systematic monitoring of RDI in the field of the green transition (M34.2 and M34.3).

The main strategic document for research and innovation is the Resolution on the Research and Innovation Strategy of Slovenia 2030, which is complementary to other sectoral strategic documents at national level (such as the Slovenian Smart Specialisation Strategy – S5, the NECP, and others). At the implementation level, it is supplemented by action plans and sector-specific strategic documents (e.g. the Research Infrastructure Roadmap 2030, and others).

Incentives for companies to support the transition to a climate-neutral society are also available under the Recovery and Resilience Plan (RRP), funded through the Recovery and Resilience Facility (RRF), as well as under the implementation of EU Cohesion Policy in Slovenia through the European Structural and Investment *Funds* (ERDF, CF and ESF), and within regional plans such as the territorial just transition plan for coal regions, supported by the EU Just Transition Fund (JTF).

### M-14 IMPROVEMENT OF SPATIAL PLANNING TO SUPPORT THE IMPLEMENTATION OF EE AND RES MEASURES

**Sectors affected by the implementation of the measure*:*** electricity generation from renewable and low-carbon sources; energy use

The measures set out in the updated NECP primarily address the siting of renewable and low-carbon energy facilities. It has become evident that, in order to ensure the effective deployment of RES and to meet the targets for both RES and EE—as well as for other low-carbon sources—spatial planning must be better integrated and certain adjustments made to the spatial planning framework. The key measures include: Preparation and update of legislation for the spatial planning of EE, RES, and other low-carbon energy sources (Measure M16.1). This includes the revision of the General Guidelines in the energy sector under the Spatial Management Act. Furthermore, it encompasses the improvement of procedures for Comprehensive Environmental Impact Assessment (CEIA) and Environmental Impact Assessment (EIA) (Measure M16.2), including the upgrading of guidelines and instructions, amendments to legal acts where necessary, and the development of a methodology for assessing the environmental impacts of wind and solar power plants. Guidance and instructions for the above-mentioned procedures will also be updated to address the assessment of impacts on climate change mitigation and adaptation. Improvement of procedures for the implementation of exemptions related to other overriding public interest objectives in RES programmes and projects (M16.3); this includes the review and upgrade of legislation governing the granting of such exemptions, as well as the preparation of necessary

supplements to technical bases and other supporting documents concerning the justification of overriding public interest and the procedures for asserting such exemptions (for HPPs, WPPs, and PSHs). One of the more extensive measures is the Preparation of technical bases for spatial planning of EE, RES and other low-carbon energy sources (M16.4), which involves the development of various expert foundations (e.g., for HPPs with a capacity above 10 MW, PSHs, geothermal installations, and the upgrading of wind and solar energy bases), with the aim of identifying potential priority areas for the supply of heat, electricity and fuels from RES and other low-carbon sources, including associated networks and energy storage. Thematic spatial programmes for RES and other low-carbon energy sources will also be developed (M16.4a). To ensure the effective implementation and spatial siting of EE, RES and other low-carbon facilities, these will also be appropriately integrated into regional and municipal spatial plans. In addition, decrees on the most suitable alternatives (UNV) and national spatial plans (DPN) for RES and low-carbon sources will be prepared (M16.7). Support will be provided to the population, investors and municipalities in the areas of spatial and energy planning and project implementation. At the same time, human resource capacities at the competent ministries will be strengthened, and the planning process and related procedures optimised. Efforts will also be directed towards the development and transfer of knowledge and experience in the field of spatial planning. A key measure also includes the Enhancement of public participation in spatial planning for the transition to a climate-neutral society (M16.12).
In addition to the updated NECP, which addresses this area, part of the measures will also be implemented or included in the Action Plan for the Implementation of the Spatial Development Strategy of Slovenia 2050 (in preparation), which will incorporate complementary measures in support of the implementation of the NECP.

## II.D.2 Energy supply

### M-15 ENDING THE USE OF COAL FOR ELECTRICITY PRODUCTION

**Sectors affected by the implementation of the measure:** electricity and heat production

Slovenia will gradually phase out the use of coal for electricity production by 2033, in accordance with the National Strategy for Coal Phase-out and Restructuring of Coal Regions[46] and the updated NECP. In addition to cross-sectoral instruments—namely the implementation of EU ETS and the Industrial Emissions Directive—the principal measure for limiting GHG emissions from thermal power plants is the Agreement on the Regulation of Mutual Relations between the Government of the Republic of Slovenia and the Šoštanj Thermal Power Plant (TEŠ). This agreement sets a schedule for the gradual reduction of the annual $CO_2$ emissions cap for TEŠ. Lignite extraction at the Velenje Coal Mine will cease by 2033 at the latest, to be followed by the decommissioning of the coal-fired electricity production units TEŠ 5 and TEŠ 6. Due to economic non-viability, TEŠ 5 may be decommissioned ahead of schedule; the same may apply to TEŠ 6. In either case, both units would be forced to shut down in the event of a disruption to domestic coal production, as the import of coal—even when co-fired with biomass—would not offer a viable solution. A dedicated legislative framework is under preparation, including the Act on the Gradual Closure of the Velenje Coal Mine and the act on the restructuring of the coal region, in line with the objective of a complete coal phase-out by 2033. Electricity production from coal-fired units will be replaced by the accelerated deployment of renewable energy sources and decentralised electricity production.

At thermoelectric and heating plant Ljubljana (TE-TOL), the combined-cycle gas unit (CCGT) began operating in 2023, replacing Units 1 and 2, which had operated on imported brown coal. Unit 3 will continue to operate on imported coal with co-combustion of biomass until no later

[46] Nacionalna strategija za izstop iz premoga in prestrukturiranje premogovnih regij v skladu z načeli pravičnega prehoda (National Strategy for Coal Phase-out and Restructuring of Coal Regions in accordance with the Just Transition Principles)

than 2033. The NECP anticipates a reduction in lignite extraction by 2030, in line with the limitations defined in the just transition strategy.

Technical and financial measures will be directed towards the implementation of the Territorial Just Transition Plan for the Savinja–Šaleška Coal Region and the Territorial Just Transition Plan for the Zasavje Region[47], with the objective of mitigating the social and economic impacts of coal sector closure. Targeted incentives are planned to support the creation of new employment opportunities and the development of skills within the regions, thereby facilitating the transition of workers from the coal industry to other economic sectors. Investment support will also be provided for renewable energy sources and high-efficiency cogeneration (CHP) as a replacement for coal-based electricity production. At the national level, the development and modernisation of electricity infrastructure will also be essential for greater integration of renewable energy sources and enhanced energy security.

As part of the coal phase-out by 2033, the establishment of strategic reserves and new electricity production units within the power system is foreseen, based on gas technologies with the potential to transition in the future to renewable fuels—such as clean hydrogen, ethanol, or similar. Analyses indicate a need for approximately 500 MW of new capacity. These new sources are expected to:

- Enter into operation prior to the coal phase-out date and be technologically diversified;
- Be located on existing energy and industrial sites (e.g. TEŠ, TET and other sites) making use of available infrastructure and ensuring geographical dispersion;
- Provide high operational availability and reliability; and
- Offer flexibility, including low technical minimums, fast ramping capabilities, and rapid start-up and shut-down functionality.

Expected impacts of the measure:

- Reduction of GHG emissions and improvement of ambient air quality.
- Energy security and power system stability based on low-carbon energy sources.
- Economic restructuring of coal regions and increased competitiveness of Slovenia in the low-carbon energy sector.

### M-16 PROMOTION OF ELECTRICITY PRODUCTION FROM RES AND HIGH-EFFICIENCY COGENERATION OF ELECTRICITY AND HEAT

**Sectors affected by the implementation of the measure:** electricity and heat production

**SUPPORT SCHEME**

Operating support under the scheme—provided either as a premium or a fixed tariff—is designed to promote electricity production from renewable energy sources (RES) and/or high-efficiency combined heat and power (CHP) generation across all sectors. The scheme applies to CHP installations with a capacity below 20 MW and RES power plants with a capacity below 10 MW, except in the case of wind farms, which must have a capacity below 50 MW. The majority of the scheme's impact is realised within the EU ETS sector.

Slovenia introduced the support scheme for promoting electricity production from high-efficiency CHP and from RES as early as 2002. The scheme has been progressively developed over time, as outlined in previous reports. The legal framework for the current support scheme is defined by the Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE)[48] and the Decree on support for electricity generated from renewable

[47] Območni načrt za pravični prehod Savinjsko-šaleške regije in Območni načrt za pravični prehod Zasavske regije (erritorial Just Transition Plan for the Savinja–Šaleška Coal Region and the Territorial Just Transition Plan for the Zasavje Region)

[48] Zakon o spodbujanju rabe obnovljivih virov energije (Uradni list RS, št. 121/21, 189/21 in 121/22 – ZUOKPOE); (Act on the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, Nos. 121/21, 189/21 and 121/22 – ZUOKPOE))

energy sources and from high-efficiency cogeneration[49], and other related secondary legislation. Since 2014, participation in the support scheme has been based on public calls issued by the Energy Agency. Projects are selected based on the availability of financial support, the project's alignment with the operational plan and objectives of the scheme, and the offered electricity price, as submitted by applicants during the public call process.

Electricity production from renewable energy sources (RES) under the support scheme has steadily increased in recent years, amounting to 938 GWh in 2018, 962 GWh in 2020, 973 GWh in 2021, 1,020 GWh in 2022, and 1,045 GWh in 2023.

Similarly, electricity produced from high-efficiency combined heat and power (CHP) installations supported under the scheme reached 320 GWh in 2018, 348 GWh in 2020, 355 GWh in 2021, 370 GWh in 2022, and 385 GWh in 2023.

In recent years, the support scheme for RES and CHP has undergone a number of adjustments. Although the number of supported units and the total installed capacity have declined, support levels have remained stable, even during periods of lower electricity production. Household consumers were exempt from paying the scheme contribution until the end of 2024. CHP installations using fossil fuels, primarily natural gas, have continued to receive support. In 2023, fossil fuel-based CHP plants accounted for the majority of subsidised electricity production within the scheme. However, no new fossil fuel-based CHP units may enter the scheme after 2023. Existing units will remain eligible for support only until the expiry of their current contracts. The forthcoming amendment to the Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE-1) will establish the legal basis for a new support framework, under which incentives for fossil fuel technologies will no longer be provided[50] [51].

**INCENTIVES FOR SELF-SUPPLY OF ELECTRICITY FROM RENEWABLE ENERGY SOURCES**

The self-supply system, established by the national Decree on the self-supply of electricity from renewable energy sources[52], enables consumers to generate electricity from renewable sources to fully or partially cover their own electricity demand through a self-supply installation. Until the end of 2024, consumers were able to enter a highly favourable annual net metering scheme. Under this arrangement, electricity costs were calculated based on the net difference between electricity taken from and fed into the grid, measured at the same metering point at the end of the billing period. The scheme applied throughout the lifetime of the installed systems. Following 2024, self-supply remains available; however, consumers are now required to pay network charges for electricity taken from the grid, while surplus electricity can be sold on the electricity market. The Eco Fund provides low-interest loans, and Borzen offers grants for the installation of systems that meet the defined self-supply criteria. The installed capacity of self-supply power plants—almost entirely solar—has grown rapidly in recent years. It stood at 21 MW in 2018, increased to 52 MW in 2019, 103 MW in 2020, 195 MW in 2021, 349 MW in 2022, and reached 556 MW in 2023[53].

**INVESTMENT INCENTIVES FOR INSTALLATIONS PRODUCING ELECTRICITY FROM RES AND FROM HIGH-EFFICIENCY CHP**

In line with each public call, investment incentives are available in the form of grants and low-interest loans for the development of small-scale renewable energy installations—such as

[49] Uredba o podporah električni energiji, proizvedeni iz obnovljivih virov energije in v soproizvodnji toplote in električne energije z visokim izkoristkom (Uradni list RS, št. 26/22); (Decree on support for electricity generated from renewable energy sources and from high-efficiency cogeneration, (Official Gazette of the Republic of Slovenia, No. 26/22))

[50] Borzen:

[51] Poročila o stanju na področju energetike v Sloveniji - Gradiva - Agencija za energijo (the Energy Agency's annual reports on the state of the energy sector in Slovenia)

[52] *Uredba o samooskrbi z električno energijo iz obnovljivih virov energije* (Uradni list RS, št. 43/22) (*Decree on the self-supply of electricity from renewable energy sources(Uradni list RS, št. 43/22)*)

[53] Poročila o stanju na področju energetike v Sloveniji - Gradiva - Agencija za energijo (the Energy Agency's annual reports on the state of the energy sector in Slovenia)

wind, solar, biomass, and small hydropower plants with a capacity of up to 10 MW—as well as for combined heat and power (CHP) systems. This investment support has been available since 2007. The measure will continue through the promotion of investments in promising and commercially viable renewable energy projects (e.g. wind, solar, geothermal), accompanied by support for essential research and innovation activities.

**OTHER INCENTIVES FOR ELECTRICITY PRODUCTION FROM RES AND CHP**

An important mechanism for promoting CHP is the mandatory share of heat from renewable sources, CHP, or waste heat, which all district heating systems are required to meet, as defined in Article 50 of the Act on Energy Efficiency (ZURE)[54].

The installation of high-efficiency CHP systems and solar photovoltaic (PV) systems for electricity generation is further encouraged through the Rules on efficient use of energy in buildings[55], which stipulate that a building is considered energy efficient if at least 50% of its final energy demand for heating, cooling, and domestic hot water is met through such systems. Electricity production from renewable energy sources is also supported through the system of guarantees of origin (GOs)[56], which aim to facilitate the trading of electricity generated from renewable sources or in high-efficiency CHP, while enhancing transparency in the electricity market. Guarantees of origin are issued and managed within the Register of guarantees of origin[57], administered by the Energy Agency.

## M-17 ADDITIONAL MEASURES TO PROMOTE ELECTRICITY PRODUCTION FROM RES AND HIGH-EFFICIENCY COGENERATION OF ELECTRICITY AND HEAT

**Sectors affected by the implementation of the measure:** electricity and heat production

The financing of renewable energy programmes will be secured through various European and national funding sources, including the Recovery and Resilience Facility (RRF), REPowerEU, the Modernisation Fund, the Common Agricultural Policy Strategic Plan 2023–2027, and the EU Cohesion Policy Operational Programme. The system of guarantees of origin will be upgraded to include renewable and low-carbon gases, as well as heating and cooling produced from renewable energy sources. A designated investor will be appointed for the construction of transmission and distribution connection infrastructure for large-scale, centralised RES production facilities. Financing sources for these investments, such as the Modernisation Fund, will also be defined.

**REVISION AND DEVELOPMENT OF A NEW SUPPORT SCHEME FOR ELECTRICITY PRODUCTION FROM RES AND HIGH-EFFICIENCY COGENERATION (CHP)**

The support scheme for electricity production from renewable energy sources and high-efficiency cogeneration will be revised in line with the objectives of the NECP. The new scheme will extend support to the production of renewable gases, as well as heating and cooling from RES. New forms of incentives will be introduced, covering not only electricity from RES and RES-based CHP but also the production of hydrogen and other synthetic gases. The scheme will offer additional support for energy communities and will introduce simplified procedures for small-scale generation installations, including guaranteed premiums and administrative simplifications. A shift towards investment-based, non-repayable financial incentives is planned for technologies that are close to market competitiveness. Incentives are also envisaged to support the development of power purchase agreements (PPAs) and the appropriate integration of RES into buildings and the energy system, including electricity and

[54] Act on Energy Efficiency (ZURE), Official Gazette of the Republic of Slovenia, No. 158/20

[55] Rules on efficient use of energy in buildings (Official Gazette of the Republic of Slovenia, No.70/22)

[56] This instrument was introduced in accordance with EU directives on the promotion of renewable energy. The legal basis for guarantees of origin in Slovenia is established by the Energy Act (EZ-1) (Official Gazette of the Republic of Slovenia, Nos. 60/19 – official consolidated text, 65/20, and 158/20 – ZURE), and the Decree on issuing declarations for generation units and guarantees of electricity origin (Official Gazette of the Republic of Slovenia, No. 182/2020).

[57] https://poi.borzen.si/

heat storage solutions.

A dedicated mechanism will be established within the scheme to promote investment in technologies for surplus electricity conversion, and spatial planning processes will be improved to enhance the feasibility of RES projects—particularly for wind farms, small hydropower plants, and large-scale solar PV installations above 1 MW. The planned measures include enhanced support for project developers during the application process, as well as improved outreach and promotion of the scheme. The system will enable cascading prioritisation of support in line with national RES targets and will foster the development of financial instruments to facilitate the integration of renewable energy in cultural heritage sites. To ensure the stability and predictability of the scheme's functioning, a monitoring and adjustment system will be established based on the achieved outcomes. The planned incentives will take into account the need for clarity, consistency, and predictability, in order to ensure a stable support system in the long term.

**SELF-SUPPLY OF ELECTRICITY FROM RES**

To increase electricity production from renewable energy sources, administrative barriers will be removed and permitting procedures simplified, in accordance with the legislative framework. Fiscal incentives for investments in self-supply are provided (Borzen). The connection of self-supply power plants to the annual net metering scheme was possible until the end of 2024. The updated NECP will ensure that self-supply remains financially attractive, taking into account network charges and energy balancing. Further measures will focus on monitoring and updating the scheme, enabling the shared use of surplus electricity, and encouraging the deployment of micro and small wind power plants. Reports from 2022 and 2023 indicate a growing uptake of self-supply systems, the development of storage solutions, and the strengthening of the legislative framework.

The self-supply instrument is designed to remain financially attractive for end users, taking into consideration the costs and benefits of grid use, as well as potential adjustments in electricity generation and consumption. Legal frameworks, such as the Local Self-Government Act, will be amended to support the active involvement of municipalities in the planning and implementation of self-supply projects. An analysis will be carried out to assess the potential for integrating micro and small wind power plants into self-supply systems, along with the introduction of appropriate financial incentives.

**IMPROVED GRID INTEGRATION OF RES INSTALLATIONS AND DEMAND-SIDE FLEXIBILITY**

A regulatory framework and appropriate economic signals will be established to enable the grid integration of renewable energy sources at locations with higher electricity consumption and connection to the medium-voltage grid. Incentives will also be provided to support production-side and demand-side flexibility, as well as participation in system services. A decentralised local flexibility market will be established and integrated with other organised markets, enhancing overall market liquidity. Investment in energy storage will be encouraged, and a dynamic network tariff structure will be introduced. To support improved planning for new grid connections, the existing location mapping system will be upgraded into a web-based tool with regularly updated data.

**PROMOTING THE DEVELOPMENT OF ELECTRICITY STORAGE SYSTEMS (ESS)**

In line with the increasing deployment of solar and wind power plants, the construction of electricity storage systems—particularly pumped-storage hydropower plants and battery storage systems—will be accelerated. All new large-scale solar power plants will be required to include integrated storage systems with a capacity of at least 25% of their rated output and sufficient storage for 2 to 4 hours of operation. The potential for installing additional reversible units at existing hydropower plants will also be assessed. The development of storage technologies will be linked to the conversion of electricity into hydrogen and synthetic fuels, as well as to their integration into the electricity and gas networks. Favourable conditions for grid

use will be established, including preferential tariffs and a moratorium on network charge payments.

**DEVELOPMENT OF THE ELECTRICITY NETWORK**

Investments will be encouraged in renewable energy generation combined with local energy storage in critical areas of the electricity system. Financial resources will be secured for grid expansion, and the regulatory framework for network charge calculation will be revised to support grid development and the achievement of climate targets. The tariff system will be adapted to promote demand-side flexibility. Focus will be placed on transitioning from pilot projects to the investment phase, and on strengthening coordination between transmission and distribution system operators.

**PROMOTING THE RENOVATION AND CONSTRUCTION OF SMALL HYDROPOWER PLANTS**

An analysis will be conducted on the potential for renovation and optimisation of existing small hydropower plants. The strategic construction of new small hydropower plants will be based on integration with existing infrastructure and the selection of environmentally acceptable sites.

**CONSTRUCTION OF LARGE HYDROPOWER PLANTS**

Between 2006 and 2017, four hydropower plants (HPPs) with a total installed capacity of 156 MW were constructed on the lower Sava River in Slovenia. Preparatory activities are currently underway for the construction of the final plant in this series—HPP Mokrice, with a planned capacity of 27.5 MW. Although funding has been secured, the environmental impact assessment must be re-evaluated before the project can proceed.

Slovenia still has potential for the development of new hydropower plants, but the associated environmental impacts must be appropriately addressed. The NECP foresees a number of activities aimed at assessing the feasibility of future hydropower development. A National Spatial Plan is currently being prepared for three hydropower plants on the middle Sava River —Suhadol, Trbovlje, and Renke—with a combined installed capacity of 96 MW and an expected average annual electricity generation of 383 Gwh. These installations are not included in the existing NECP covering the period up to 2030. Additional hydropower potential has been identified along the middle Sava River in the areas of Litija and Ljubljana. Future development of hydropower will be prioritised in areas not designated under the Natura 2000 network. However, most projects will require a procedure to establish the overriding public interest of climate protection or renewable energy use, in relation to the public interest of nature conservation. The outcome of such procedures remains uncertain, raising questions as to the extent to which these projects will ultimately be realised.

### M-18 SUPPORT FOR THE DEVELOPMENT OF LOCAL ENERGY COMMUNITIES AND RENEWABLE ENERGY COMMUNITIES

**Sectors affected by the implementation of the measure:** electricity and heat generation

In the NECP, energy communities are recognised as an instrument for achieving the objectives of a just transition towards a climate-neutral society. Promoting local electricity generation and community-based renewable energy (RES) projects is essential for the decentralisation of the energy system and for increasing self-sufficiency and energy independence. The NECP foresees the establishment of a supportive legislative framework to accelerate the development of communities based on the use of renewable energy sources (e.g., shared power plants). This was implemented in 2021 and 2022 through the adoption of the Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE)[58], the Electricity Supply Act (ZOEE)[59], and the new Decree on the self-supply of electricity from renewable energy sources[60]. A support scheme is planned to foster the development of local energy

[58] Official Gazette of the Republic of Slovenia, Nos. 121/21, 189/21 and 121/22 – ZUOKPOE
[59] Official Gazette of the Republic of Slovenia, No. 172/21
[60] Official Gazette of the Republic of Slovenia, No. 43/22

communities. This will include technical and human resource support for the implementation of projects at the local level, as well as financial incentives for demonstration projects. The Decree on the self-supply of electricity from renewable energy sources defines the detailed provisions for promoting the use of electricity generated from RES through self-supply systems. It sets out specific conditions for different types of self-supply, the methodology for calculating electricity consumption and related charges, the detailed criteria for the allocation of investment aid, connection conditions, reporting obligations, and the monitoring of implementation.

Local energy communities can help advance the interests of their members and contribute to achieving national environmental and energy objectives, serving as a driver of sustainable development through a bottom-up approach. Energy production at the local level is crucial for promoting the use of renewable energy sources, expanding democratic participation in the energy sector, and reducing energy poverty. European environmental and energy legislation has established the foundations for formalised energy community models, which Slovenia adopted through new legislation in 2021 and 2022. A political decision was made to increase financial support for large municipal renewable energy plants, with a particular focus on solar installations.

Support for local energy communities is also provided through funding from European Cohesion Policy instruments—namely the European Regional Development Fund and the Cohesion Fund—as planned under the European Cohesion Policy Programme 2021–2027 in Slovenia[61].

The establishment and expansion of renewable energy communities (RES communities) will be supported through the identification and removal of legislative barriers, simplification of administrative procedures via a one-stop-shop model, provision of financial support instruments, and promotion of large-scale collective projects—particularly at sites where all generated electricity is consumed locally. Awareness-raising and capacity-building programmes will also be implemented to encourage public participation in RES communities.

By the end of 2024, Slovenia had recorded a sharp increase in the installed capacity of solar power plants, primarily due to the highly favourable annual net metering scheme for electricity production and consumption. As of 1 January 2024, entry into the annual net metering scheme is no longer permitted. Given the number of applications for the connection of self-supply installations—29,820 in 2022, 47,990 in 2023, and only 3,981 in 2024[62]—a decline in further growth is anticipated in the absence of new incentives. Additional growth in the installed capacity of solar power plants could be stimulated by strengthening support for local energy communities and renewable energy communities. To this end, the revised NECP outlines the following measures:

- Integration of energy communities into Local Energy Concepts (LEKs): a legal and regulatory framework will be established to enhance the involvement of local communities in decision-making and the implementation of energy projects.
- Financial incentives for community projects: non-repayable grants and favourable loan mechanisms are foreseen for the development of larger community-based renewable energy plants at suitable locations.
- Education and awareness-raising: training and information programmes will be delivered for key stakeholders—including municipalities, businesses, and households—with the aim of increasing public engagement in energy communities.

61 Javni razpis za sofinanciranje naložb v skupnostno samooskrbo z električno energijo iz obnovljivih virov energije | GOV.SI (Public Call for Co-financing Investments in Community Self-Supply from Renewable Energy Sources | GOV.SI (in Slovene))

62 Stanje vlog za samooskrbo | SODO | Sistemski operater distribucijskega omrežja z električno energijo (Status of self-supply applications | SODO – Distribution System Operator)

- Promotion of innovative energy management models: new models will be developed for shared energy use, enabling collaboration between local electricity consumers and producers to optimise the use of renewable energy.
- Integration of energy communities into broader energy markets: enabling energy communities to participate in electricity markets will enhance their economic sustainability and competitiveness.

The number of energy community installations has steadily increased: one was recorded in 2019, four in 2020, thirty in 2021, fifty-seven in 2022, and 171 in 2023. The total installed capacity of energy community production facilities rose from 14 kW in 2019 to 8,200 kW in 2023. In 2022, 230 consumers were included in energy communities, and by 2023 this number had increased to 467 consumers[63].

### M-19 PROMOTION OF DISTRICT HEATING PRODUCTION FROM RENEWABLE ENERGY SOURCES AND HIGH-EFFICIENCY CHP

**Sectors affected by the implementation of the measure:** electricity and heat production

A key mechanism for promoting high-efficiency CHP is the mandatory share of heat from renewable energy sources (RES), high-efficiency cogeneration (CHP), or waste heat, which all district heating systems (DHS) are required to achieve, as set out in Article 50 of the Act on Energy Efficiency (ZURE). Under this provision, distributors must annually supply heat from at least one of the following sources: (i) a minimum of 50% from RES; (ii) a minimum of 50% from waste heat (WH); (iii) a minimum of 75% from high-efficiency CHP; or (iv) a minimum of 50% from a combination of the above three sources. As of the end of 2023, out of 110 registered district heating and cooling systems (DHCS), 68 systems—or 61.8%—were classified as efficient. Across all DHS in Slovenia, 75.3% of heat was produced either from RES or in high-efficiency CHP installations.

A revision of the Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE) is planned to introduce a binding obligation to increase the share of heat from RES and WH by at least 2.2% annually until 2030. This measure aims to reach a minimum 25% share by 2030 and at least 40% by 2035. In support of this target, the introduction of a dedicated incentive model is planned to encourage DHCS operators to accelerate the integration of RES and WH. To ensure the effective preparation and implementation of sustainable DHCS development plans—including renovation, expansion, and new construction—capacity-building programmes and technical assistance for project development will be made available, along with digitalised procedures for monitoring implementation.

Operating support under the scheme (in the form of a premium or a fixed tariff) is intended to promote electricity production from renewable energy sources (RES) and/or high-efficiency combined heat and power (CHP) generation across all sectors. The scheme applies to CHP installations with a capacity of less than 20 MW and RES power plants with a capacity of less than 10 MW, with the exception of wind farms, which must be below 50 MW (for a more detailed description, see M-16).

The installation of high-efficiency CHP systems is also supported under the Rules on efficient use of energy in buildings (PURES, 2022), which recognise CHP using non-renewable fuels as a renewable energy technology in proportion to the heat it produces.

As part of the plan to ensure stable, predictable and sufficient financial resources and the regular implementation of calls to support district heating (DH), a public call was launched in 2023 under the Recovery and Resilience Plan (RRP) for the co-financing of the transition of DH systems to renewable energy sources for the 2023–2025 period. The call was closed early in 2024 after EUR 2.9 million of the €11 million allocated had been committed. It was

[63] Poročila o stanju na področju energetike v Sloveniji - Gradiva - Agencija za energijo (the Energy Agency's annual reports on the state of the energy sector in Slovenia)

subsequently replaced by a new call under the RRP for the 2024–2026 period, which allocates EUR 25 million to measures aimed at increasing electricity and heat production from RES. Eligible investments include heat pumps, solar thermal collectors, wood biomass boilers, and the construction of RES-based CHP installations within existing DH systems.

### M-20 ADDITIONAL MEASURES TO PROMOTE DISTRICT HEATING PRODUCTION FROM RENEWABLE ENERGY SOURCES AND HIGH-EFFICIENCY CHP

**Sectors affected by the implementation of the measure:** electricity and heat production

To support local energy planning and to guide the prioritised use of energy sources for heating and cooling—consistent with the principles of sustainable development, energy efficiency, and the use of renewable energy—training will be provided for the authors of municipal spatial plans and Local Energy Concepts (LEKs). These include municipal heating and cooling plans, which are intended to ensure equal development opportunities for district heating systems.
The NECP also foresees amendments to the Act on heat supply pricing methodology, which will introduce a regulated return on assets for district heating and cooling system (DHCS) operators, while providing a legislative framework for the introduction of advanced tariff models. These include, for example, a motivational variable tariff component (bonus/malus) linked to return temperatures—aimed at reducing the temperature levels in the distribution network—and incentives to encourage active consumer participation, including demand-side flexibility and prosumer involvement.

To support the development of DHCS and promote the use of geothermal energy—either through direct utilisation or large-scale heat pumps—expert technical studies will be prepared. These will include an analysis of geothermal potential in combination with other RES within DHCS, and the identification of priority or strategic areas of public interest where spatially concentrated geothermal potential justifies targeted deployment. Relevant sectors include agriculture (e.g. greenhouses and cold storage), buildings, and industry (for heating and cooling purposes). Environmental acceptability criteria will be defined, along with specific technical measures to ensure their compliance, including the management of impacts on groundwater. The potential for constructing large-capacity heat and cold storage facilities will also be assessed, enabling long-term energy storage.

Measures to strengthen the enabling environment for DHCS will include: (i) the development of financial and regulatory instruments to reduce investment-related risks associated with large-scale and long-term infrastructure projects; (ii) the preparation of guidelines and implementation tools (such as model agreements and contracts) to support the development of heat supply based on a “heat as a service” model; (iii) the introduction of energy performance contracting for the renovation of substations and internal heating systems as part of the mandatory energy savings target; and (iv) the establishment of criteria and conditions for the centralised supply of public buildings with heat and cold, aimed at securing stable core demand to facilitate system expansion and sustainable development.

## II.D.3 Energy Consumption – Industry

### M-21 PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN INDUSTRY

**Sectors affected by the implementation of the measure:** energy use in industry and construction

Until 2024, the promotion of energy efficiency in the business sector was implemented mainly through three framework financial mechanisms: through the Cohesion Fund; through the energy savings obligation scheme for companies that sell energy (2,296 GWh of energy

savings achieved in 2023, of which approximately 244 GWh in industry[64]); and through repayable and non-repayable financial support. Within the energy savings obligation scheme (obligated parties), measures implemented in the industrial sector included electricity self-supply projects and measures requiring an energy audit.

Repayable and non-repayable incentives for businesses are also provided by the Eco Fund. However, the Eco Fund Annual Report for 2023[65] does not contain data on energy or emission savings achieved by industrial enterprises. Energy savings linked to Cohesion Fund financing were also not estimated, as the financial monitoring system in place was not structured to support such analysis.

Investments financed through loan agreements signed in 2023 with legal entities, sole traders, and individuals are expected to contribute to an annual reduction of GHG emissions by 1,340 tonnes $CO_2$, and to a reduction in energy use of 2.9 GWh. Following their implementation, these investments are also expected to produce 1.7 GWh of green electricity (i.e., electricity from renewable sources)[66].

For the period from 2021 to 2025, the Eco Fund has allocated EUR 34.0 million[67] in non-repayable financial assistance to business entities and other legal persons to promote energy efficiency measures in buildings and the use of renewable energy sources. It also supports measures for the efficient use of electricity, such as the installation of energy-efficient lighting systems and electric motor drives, optimisation of technological processes, and recovery of waste heat. The number of investments is limited by the amount of funding available, and public calls for project proposals remain open until the funds are fully committed. At the end of 2024, the Eco Fund issued a public call for non-repayable financial incentives for new investments in energy efficiency and renewable energy use by business entities. The aim of the call is to encourage the implementation of measures to improve energy efficiency in buildings and technological processes, the efficient use of electricity, the use of waste heat in industrial processes, and the uptake of renewable energy sources. The total amount of non-repayable funding available under the call is EUR 4,000,000. The level of support may cover up to 30% of eligible investment costs.

The Eco Fund also co-finances non-repayable financial incentives for energy audits in small and medium-sized enterprises (SMEs) in the industrial and service sectors, as well as the implementation of energy management systems.

Until 2030, industry will continue to have access to financial support for investments in energy efficiency and the use of renewable energy sources through the energy savings obligation scheme for companies that sell energy, through Eco Fund programmes, and through various entrepreneurship support schemes. These will incorporate requirements related to improved energy efficiency and the integration of renewable energy sources.

SID Bank offers a range of financial instruments aimed at supporting sustainable economic growth and development, investment in innovation, and working capital financing, through both

[64] Poročilo o stanju v energetiki v Sloveniji za leto 2023, Agencija za energijo, 2024 (Report on the energy situation in Slovenia for 2023, Energy Agency, 2024), https://www.agen-rs.si/documents/10926/38704/Poro%C4%8Dilo_o_stanju_v-energetiki_v_Sloveniji_za-leto-2023_Agencija_za-energijo.pdf/d90eab12-a4c0-45d7-9a54-9e0d25ef2c4c

[65] https://www.ekosklad.si/informacije/o-skladu/letna-porocila/letno-porocilo-eko-sklada-za-leto-2023

[66] Letno poročilo Eko sklada, slovenskega okoljskega javnega sklada, za leto 2023, junij 2024, (Annual Report of Eco Fund, the Slovenian Environmental Public Fund, for 2023, June 2024) https://www.ekosklad.si/informacije/o-skladu/letna-porocila/letno-porocilo-eko-sklada-za-leto-2023

[67] Poslovni in finančni načrt Eko sklada, slovenskega okoljskega javnega sklada, za leto 2021-2025, Eko sklad, februar 2017 (Business and Financial Plan of Eco Fund, the Slovenian Environmental Public Fund, for 2021–2025, February 2017)

debt and equity instruments. These instruments target a range of areas including research, development and innovation, support for SMEs, digitalisation, energy efficiency, and sustainable urban development. In this context, SID Bank provides financing for sustainable projects and companies through the SID GREEN programme, which enables investment and working capital financing for projects in the Republic of Slovenia, including the refinancing of preparatory and implementation activities up to a maximum of 10% of the loan value. Green projects may also be financed under all SID Bank programmes, as sustainability-oriented projects are eligible for support through the issuance of green bonds. Green bonds are based on a financing model designed for environmental projects through capital markets. The funds raised through the issuance of green bonds may be used for environmentally efficient products, technologies and processes; pollution prevention and control; sustainable management of vital natural resources and water resources; renewable energy; energy efficiency; and clean transport.

The Smart Specialisation Strategy (S5)[68] continues to serve as the basis for implementing European Cohesion Policy in the industrial sector during the 2021–2027 programming period. EU regulations foresee the renewal of the strategy and define it as an enabling condition for accessing funding under Policy Objective 1 – A Smarter Europe. The implementation of S5 is based on a development cooperation model that fosters stronger, institutionalised collaboration between the government, businesses, knowledge institutions, and other relevant stakeholders in the field of research, development and innovation. Strategic Research and Innovation Partnerships (SRIPs) play a key role in promoting cooperation among innovation stakeholders, while inter-ministerial coordination is essential at the national level, given that the implementation of S5 falls within the remit of several ministries. SRIPs work with the government not only to co-develop development policy (e.g., through the joint identification of national strategic priorities), but also to establish a comprehensive development and innovation ecosystem across the S5 priority areas. These include: strengthening research and innovation capacities and the deployment of advanced technologies; enhancing SME growth, competitiveness and job creation; developing skills and competences for smart specialisation, industrial transition and entrepreneurship; and supporting digital transformation.
All measures listed in the chapter on cross-sectoral instruments are, of course, also relevant for industry.

### M-22 ADDITIONAL ACTIVITIES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN INDUSTRY

**Sectors affected by the implementation of the measure:** energy use in industry and construction

The NECP foresees a number of financial incentives, in the form of both repayable and non-repayable support, aimed at promoting energy efficiency and the deployment of renewable energy sources in industry. Under the Investment Promotion Act (ZSInv), intensive support is envisaged for investments contributing to the green technological transition. Funding is directed in accordance with criteria relating to energy efficiency, renewable energy sources, low-carbon technologies, and circularity, particularly where financed from dedicated sources such as the Climate Change Fund. Special emphasis is placed on small and medium-sized enterprises (SMEs) and complex cross-sector projects.

Within the framework of the LIFE IP Care4Climate project, activities are being implemented until 2026, including technical assistance for Eco Fund public calls and the analysis and development of new incentives for businesses in the areas of energy efficiency and renewable energy.

[68] Implementation and renewal of the Slovenian Smart Specialisation Strategy – from S4 to S5) https://www.gov.si/zbirke/projekti-in-programi/izvajanje-slovenske-strategije-pametne-specializacije/

An incentive scheme for energy efficiency and renewable energy in industry is being developed. It includes a mix of financial instruments (repayable, non-repayable, and blending mechanisms), primarily financed through EU sources, REPowerEU, and the Eco Fund. The scheme covers: expansion of the range of measures, an increase in the volume of available funding, and the development of targeted support mechanisms, including the promotion of energy performance contracting. Incentives will also be provided for the establishment of energy communities connecting industry, local energy systems, and residents, in order to harness synergies such as waste heat utilisation, hydrogen use, and community-based solar power generation.

On the basis of the Decree on indirect costs compensation (Official Gazette of the Republic of Slovenia, No. 25/23), the NECP envisages incentives for improving energy and material efficiency, for producing energy from renewable sources, and for investments aimed at reducing process-related GHG emissions and other pollutants. The Decree lays down the method and conditions for granting compensation to sectors exposed to the risk of carbon leakage. To ensure the effective use of funds, detailed criteria will be prepared to ensure that the allocated resources contribute directly to emissions reduction and the sustainable development of industry.

Support programmes and technical assistance are also being developed for SMEs, to encourage those not subject to mandatory energy audits to undertake such audits and subsequently implement the recommendations arising from them.

## II.D.4 Energy Consumption – Buildings

### M-23 PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN BUILDINGS – GENERAL

**Sectors affected by the implementation of the measure:** energy use in the public sector, the private services sector, and households

**LEGISLATION AND STRATEGIC DEVELOPMENT DOCUMENTS ON ENERGY EFFICIENCY IN BUILDINGS**

In 2022, new Rules on efficient use of energy in buildings (PURES)[69] was adopted. Together with the *Technical Guideline – Efficient use of energy TSG-1-004:2010*, it sets out the requirements for minimum energy performance of buildings in the case of new construction and major renovations of existing buildings, as well as minimum requirements for maintenance and technical improvements[70]. A further update of PURES is planned for 2026.

In 2021, the *Long-term energy renovation strategy for 2050 (DSEPS 2050)*[71] was adopted. Its overarching goal is to renovate the national stock of public and private residential and non-residential buildings into a highly energy-efficient and decarbonised building stock by 2050. The target for 2030 is to reduce GHG emissions in the buildings sector by at least 70% compared to 2005 and to move towards net-zero emissions by 2050. This is to be achieved through the continued promotion of deep energy renovation of buildings and heating based on renewable energy technologies, including district heating systems that utilise renewable energy sources. Due to the recast of the Energy Performance of Buildings Directive adopted in 2024[72], the revision of DSEPS is planned by 2026 to ensure the transposition of the updated requirements.

**ENERGY RENOVATION OF BUILDINGS**

To support the energy renovation of buildings, DSEPS 2050 introduced, and NECP 2024 further developed, an instrument aimed at establishing and upgrading a system for ensuring

[69] Official Gazette of the Republic of Slovenia, Nos.70/22, 161/22, 129/23 and 103/24

[70] Technical improvements are foreseen before the end of the service life of individual building elements, systems, and subsystems.

[71] https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/dseps/dseps_2050_final.pdf

[72] Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

the quality of energy renovation of buildings. This is implemented through a structured stakeholder cooperation process, the certification of contractors and processes, and the education and training of stakeholders. The instrument is partially implemented under the LIFE IP CARE4CLIMATE project, which has been implemented since 2019 under the leadership of MECE (https://www.care4climate.si/sl).

One of the challenges in building renovation is the renovation of cultural heritage buildings, which, due to their specific characteristics, usually require higher investment and certain deviations from the renovation parameters applicable to other buildings. In 2016, *Guidelines for the Energy Renovation of Cultural Heritage Buildings*[73] were adopted. These provide guidance on architectural and design aspects of energy renovation in line with conservation objectives, as well as guidance for the implementation of pilot projects. The preparation of updated guidelines is planned for 2025, with their adoption foreseen for the following year. At the same time, the preparation of guidelines for targeted financing of comprehensive renovations of cultural heritage buildings is also planned. This will include the revision and integration of financing criteria into public calls to facilitate easier access to funding for the energy renovation of such buildings. Under the calls for funding from the Cohesion Fund within the Operational Programme for the Implementation of the EU Cohesion Policy 2014–2020 (OP EKP 2014–2020)[74], these buildings were already evaluated based on specific criteria. Non-repayable financial incentives for their energy renovation are also available from European funds in the 2021–2027 programming period. Between 2023 and 2026, the energy renovation of cultural heritage buildings will also be co-financed from the Climate Change Fund. Three projects will be implemented under this framework, involving the renovation of a total surface area of 6,110 m².

**ENERGY PERFORMANCE CONTRACTING (EPC)**

The purpose of energy performance contracting (EPC) is to support the achievement of a greater volume of energy renovation projects through the involvement of private partners. Under the Operational Programme for the Implementation of the EU Cohesion Policy 2014–2020 (OP EKP 2014–2020), a total of 134 projects in the public sector were supported with non-repayable funding from the Cohesion Fund. Of these, 48 projects (37%) were implemented using the EPC model. These projects accounted for slightly more than two-thirds of the total floor area of buildings included in the programme and, to an even greater extent — 69% — of the total energy savings achieved. Looking ahead, the continued development and practical implementation of existing financial instruments and financing models is foreseen, including the expansion of the measure beyond the public sector to other sectors, particularly the residential sector, and the promotion of the establishment of energy service companies.

### M-24 ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN BUILDINGS – GENERAL

**Sectors affected by the implementation of the measure:** energy use in the public sector, the private services sector, and households

A transition to comprehensive building renovation is planned for the period up to 2030. This includes, among other elements, the establishment of an appropriate regulatory framework for the sustainability assessment of buildings, the preparation of a basis for the promotion and financing of sustainable renovation—taking into account not only energy-related aspects but also other key dimensions of building renovation (such as seismic and fire safety, radon-related issues, etc.)—the implementation of pilot projects, and the development of a plan for sustainable building renovation and an associated financial plan. As part of the LIFE IP CARE4CLIMATE project, sustainability indicators for construction in Slovenia (SLO kTG) are

[73] Smernice za energetsko prenovo stavb kulturne dediščine, Ministrstvo z infrastrukturo in Ministrstvo za kulturo, 2016 (Guidelines for the Energy Renovation of Cultural Heritage Buildings, Ministry of Infrastructure (MI) and Ministry of Culture (MC), 2016).

[74] https://www.eu-skladi.si/sl/dokumenti/kljucni-dokumenti/op_slo_web.pdf

being developed. Their purpose is to further reduce environmental impacts and GHG emissions in the construction sector. The project also includes practical testing of SLO kTG and the preparation of guidelines for sustainable construction.

In mid-2021, the *Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE)*[75] was adopted. Article 53 of the Act prohibits the design and installation of boilers using light fuel oil (LFO), heavy fuel oil (HFO), and coal, except where their use is part of an industrial or production process. This provision entered into force on 1 January 2023. In 2025, a programme will be developed for the phase-out of fossil fuel use by 2050 for various building typologies. Within this framework, an increase in non-repayable investment incentives is foreseen, alongside the establishment of additional financial instruments for the replacement of fossil-fuel-based heating systems with efficient and sustainable alternatives. A faster transition to renewable energy sources will also need to be supported through the appropriate calibration of the $CO_2$ emissions levy and excise duties on fossil heating fuels.

An important complementary activity involves exploring possible solutions for distributing incentives or their effects between property owners and tenants in the residential, public, and private services sectors. Special attention will also be devoted to the establishment of active buildings. In this context, solutions and measures will be developed to support effective energy monitoring in buildings and the efficient integration of renewable energy sources, in order to improve the alignment of production and consumption, enhance energy and cost efficiency, and ensure greater security of supply.

### M-25 PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN HOUSEHOLD

**Sectors affected by the implementation of the measure:** energy use in households

**SCHEMES OF REPAYABLE AND NON-REPAYABLE SUPPORT FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY IN RESIDENTIAL BUILDINGS**

The main instrument for increasing energy efficiency and the use of renewable energy sources in households consists of financial incentives granted by the Eco Fund. These have been available for investments in single- and two-dwelling buildings since 2008, and in multi-dwelling buildings since 2009. The range of measures[76] eligible for non-repayable support may vary between individual public calls, as may the level of incentives provided.

Since 2014, non-repayable financial support from the Eco Fund has been financed from two sources: the energy efficiency contribution and the Climate Change Fund. As Eco Fund programmes are also included as an alternative measure under the energy savings obligation scheme in accordance with Article 7 of the 2012 Energy Efficiency Directive (EED) and Article 8 of the 2023 recast EED (see also the instrument Obligation of energy suppliers to achieve energy savings among final consumers M-10), the annual volume of non-repayable incentives disbursed for measures in the household sector has increased significantly since 2019. During the 2021–2023 period, a total of EUR 135 million in non-repayable incentives was disbursed. For comparison, EUR 214 million was disbursed over the 2014–2020 period. The estimated impact on annual GHG emissions reduction is 179 kt $CO_2$ eq.

Households may also obtain favourable loans from the Eco Fund to implement energy efficiency and renewable energy measures. In addition, household-level measures are also

[75] Act on the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, Nos.121/21, 189/21, 121/22 – ZUOKPOE and 102/24)

[76] These measures include improvements to the building envelope (insulation of roofs, ceilings and floors, installation of energy-efficient wooden windows), heating systems (heat pumps, biomass boilers, solar thermal systems), and other technologies (ventilation systems)..

supported under the energy savings obligation scheme for obligated parties (see also the instrument Obligation of energy suppliers to achieve energy savings among final consumers M-10).

**SUPPORT FOR MORE EFFICIENT ENERGY USE IN RESIDENTIAL BUILDINGS**

An important activity supporting more efficient energy use in residential buildings is the operation of the ENSVET energy advisory network, which has been active since 1993 and, since 2014, has operated under the Eco Fund. The network provides citizens with independent energy advice and carries out information, educational and awareness-raising activities to promote energy efficiency measures and the use of renewable energy sources at the local level. It also contributes to the implementation of measures to address energy poverty. In 2023, 49 trained independent energy advisors operated across 59 ENSVET offices, delivering a total of 8,049 activities (consultations with written reports, e-advice, articles, radio and television contributions, lectures, school programmes, etc.). The target for 2027 is to deliver 15,000 activities. The continuation and further strengthening of advisory services is planned, including expansion into additional municipalities and the extension of advisory activities to businesses. Enhanced support is also foreseen for unit owners in planning energy renovation projects for multi-dwelling buildings.

The instrument governing the mandatory distribution and billing of heating costs in multi-dwelling buildings has been in place since 2011. The regulation[77] covering this area was last amended in 2016. In 2025, a review is planned to assess whether changes are necessary and, if so, to initiate the appropriate procedures.

**IMPLEMENTATION OF MEASURES TO REDUCE ENERGY POVERTY**

Measures to reduce energy poverty are implemented by the Eco Fund. Targeted activities are being carried out that contribute to lower energy consumption and costs, as well as to improved living conditions. Currently, energy-poor households are eligible for incentives covering 100% of investment costs, both for the energy renovation of multi- dwelling buildings and for the implementation of measures[78] under the ZER public calls, which have succeeded the ZERO500 programme. The Eco Fund implemented the ZERO500 programme on a pilot basis during the 2020–2023 period, with EUR 5 million in Cohesion Fund resources available for this purpose. Under the most recent public call for non-repayable incentives to reduce energy poverty, ZER 2024, funding is provided from the European Regional Development Fund (ERDF). Including national co-financing, a total of EUR 19.8 million is available.

Between 2021 and 2023, a total of 512 old solid fuel heating systems were replaced with new biomass systems[79] in energy-poor households under various public calls, and 32 unit owners received support for investments in energy renovation of multi- dwelling buildings. Under the ZERO500 programme, 559 measures were implemented in 425 energy-poor households during the same period. In 2022, the Decree on criteria for the definition and assessment of the number of energy-poor households[80] was adopted, which defines energy poverty. In 2023, the Action Plan to Alleviate Energy Poverty for a three-year period[81] was adopted. Its implementation is planned for the 2024–2026 period. In addition to the continued implementation of existing instruments, the establishment of a comprehensive scheme for reducing energy poverty is also foreseen—initially on a pilot basis, and after 2027, at full scale.

[77] Pravilnik o načinu delitve in obračunu stroškov za toploto v stanovanjskih in drugih stavbah z več posameznimi deli (Rules on dividing and billing heating costs in multiple-dwelling and other buildings with several units) (Official Gazette of the Republic of Slovenia, Nos. 82/15, 61/16 and 158/20 – ZURE)

[78] Eligible measures include thermal insulation of the roof, ceiling, external walls and floors, installation of energy-efficient building envelope elements, systems for domestic hot water preparation, local mechanical ventilation with heat recovery, and replacement of old heating systems with new systems using wood biomass.

[79] Until 2023, non-repayable incentives for the replacement of old heating systems with new biomass systems were available through separate public calls. Since the end of 2023, this measure has been included in the ZER calls..

[80] Official Gazette of the Republic of Slovenia, No. 132/22

[81] https://www.energetika-portal.si/fileadmin/dokumenti/podrocja/energetika/energetska_revscina/an_enrev_nov2023.pdf

An update of the action plan is foreseen in 2026 and 2029. A Social Climate Plan, which is a prerequisite for drawing on resources from the EU Social Climate Fund, is currently being prepared and is expected to be completed by mid-2025. The Social Climate Plan will also include measures to reduce energy poverty.

To achieve GHG reduction targets and ensure a just transition, it will also be necessary to prepare and implement complementary policies and measures to reduce and prevent energy poverty within development, wage, employment, tax, housing, social and other policy frameworks.

### M-26 ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN HOUSEHOLDS

**Sectors affected by the implementation of the measure:** energy use in households

**ADDITIONAL MEASURES FOR HOUSEHOLDS IN THE CONTEXT OF RESIDENTIAL BUILDING RENOVATION**

Most of the additional measures to promote energy efficiency and the use of renewable energy sources in households are focused on the renovation of residential buildings. One of the measures targets amendments to the regulations governing consent procedures for decisions on building renovations in jointly owned properties and on borrowing. Under the current rules, a 75% majority of unit owners is required to approve a comprehensive energy renovation, while unanimous consent is required for decisions to take and repay a loan using the building's reserve fund. It is planned that these consent procedures will be revised, making the implementation of energy renovation projects in multi- dwelling buildings more feasible. Additional activities will be developed to encourage comprehensive renovation of multi-dwelling buildings, alongside the provision of additional non-repayable financial support combined with various financial instruments to enable such renovations.

Activities to promote investment in the comprehensive energy renovation of multi- dwelling buildings are already under way within the LIFE IP CARE4CLIMATE project. Two financial instruments have been developed. The first enables the financing of comprehensive renovations through a favourable loan repaid from the reserve fund of the multi- dwelling building. The second includes co-financing by an energy services company as part of the renovation financing. Both financial instruments, which will be piloted in 2025 in five demonstration projects, also include non-repayable financial support for the investment. A third financial instrument is also under development.

In cooperation with financial institutions in Slovenia and the EU, the potential for establishing a guarantee scheme is being explored. The scheme would provide individual guarantees for borrowers or for the reserve fund in the event of borrowing for the purpose of building renovation. In this context, the provision of financial resources for establishing the scheme is planned, and implementation is expected to begin in 2027.

To increase the number of comprehensive renovations in multi- dwelling buildings, an additional measure will be the establishment of a project office for the comprehensive renovation of residential buildings. The objective of this measure is to increase the volume and enhance the quality of preparation for comprehensive and sustainable renovation projects, based on a "one-stop-shop" approach, and to support the implementation of financial instruments for the comprehensive renovation of all residential buildings. The office is expected to commence operations in 2026.

A dedicated measure is also planned for the comprehensive renovation of publicly owned housing. Activities will start in 2026 with a comprehensive inventory of publicly owned housing, assessing housing quality, seismic safety, energy performance, and the potential and suitability for renovation and energy upgrades (including the integration of renewable energy

sources). This will be followed by the preparation of a strategy for the comprehensive renovation of the public housing stock. Its implementation is planned for the 2027–2035 period.

**FURTHER DEVELOPMENT OF FINANCIAL INCENTIVES FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY INVESTMENTS IN HOUSEHOLDS**

To achieve the targets in the areas of energy savings and the renovation of residential buildings aimed at reducing energy consumption and GHG emissions, the financial incentives for investments in energy efficiency and the use of renewable energy sources in households are planned to be further enhanced. This includes a wide range of activities: the preparation of a financial plan to support household-level measures, including the identification of funding sources, incentive mechanisms, and measures to remove key barriers; the provision of support for project preparation in the residential sector; the implementation of pilot projects; the development of new financial instruments for investments in energy efficiency and renewable energy; the strengthening of the Eco Fund's operations, particularly in the field of awareness-raising and information dissemination in cooperation with Borzen; the simplification of administrative procedures for granting incentives; and other related actions. The Long-term energy renovation strategy for 2050 (DSEPS 2050) also envisaged a measure to ensure sufficient funding for financial incentives for energy efficiency and the use of renewable energy sources in residential buildings, through the gradual increase of the energy efficiency contribution on energy use. However, this measure has not been implemented.

### M-27 PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN THE PUBLIC SECTOR

**Sectors affected by the implementation of the measure:** energy use in the public sector

**ENERGY MANAGEMENT IN THE PUBLIC SECTOR**

Mandatory energy management in the public sector was introduced in 2016. It comprises energy accounting, the implementation of energy efficiency and renewable energy measures, and the reporting of energy costs, energy product types, and the implementation of related measures. This obligation applies to all buildings with a usable floor area exceeding 250 m² that are owned or managed by public administration entities in the broadest sense. The legal basis was initially established under the Energy Act (EZ-1), and since 2020 has been governed by the Act on Energy Efficiency (ZURE). At the implementation level, the relevant provisions are set out in the Decree on energy management in the public sector[82].

**SCHEMES OF REPAYABLE AND NON-REPAYABLE SUPPORT FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY IN THE PUBLIC SECTOR**

Non-repayable financial support for the energy renovation of public buildings has been available since 2010. Initially, this support was provided through cohesion funds under the Operational Programme for Environmental and Transport Infrastructure Development 2007–2013 (OP ROPI)[83], and later under the Operational Programme for the Implementation of the EU Cohesion Policy 2014–2020 (OP EKP 2014–2020). The latter programme supported energy renovation of buildings in the core public sector, municipalities, and the wider public sector, specifically for buildings owned by the state. To achieve a higher volume of energy renovations, the OP EKP 2014–2020 also included incentives for the co-financing of projects implemented under the energy performance contracting (EPC) model.

In the second programming period, a total of 134 projects were supported with nearly EUR 110 million in non-repayable funds. These projects covered the renovation of 1 million m² of building floor area and resulted in annual emission reductions of 21 kt $CO_2$ equivalent. Municipalities were the most successful in implementing energy renovation projects, accounting for 69% of all projects and 71% of the total renovated floor area. The core public

[82] Official Gazette of the Republic of Slovenia, Nos.52/22, 116/22and 158/20 – ZURE

[83]http://www.eu-skladi.si/kohezija-do-2013/predpisi/operativni-programi/2007-2013/operativni-program-razvoja-okoljske-in-prometne-infrastrukture/OPROPIcistopis_9_9_2015.pdf

sector was the least active, with only six completed projects. This had a negative impact on the achievement of the mandatory target for the share of renovated buildings in the core public sector under Article 5 of the 2012 Energy Efficiency Directive (EED). The required annual renovation of 3% of the total floor area of buildings owned and occupied by central government, which are heated and/or cooled, was not met in any year during the 2014–2023 period. This obligation is now being extended to the entire public sector under the revised Energy Efficiency Directive adopted in 2023.
The energy renovation of public buildings under the cohesion policy framework is continuing in the 2021–2027 programming period. In 2024, a call for proposals was issued for municipalities, with EUR 30 million available for the comprehensive energy renovation of buildings and EUR 4.5 million for the construction of new solar electricity generation facilities, in line with the electricity self-supply model. A similar call was issued in early 2025 for the core and wider public sector, specifically for buildings owned by the state. EUR 16 million was made available for the first objective and EUR 2.4 million for the second. Under the Recovery and Resilience Plan (RRP), energy renovation is also being implemented for public buildings of exceptional administrative or societal importance. By mid-2024, 24 projects had been selected for implementation under this programme. Under the Recovery and Resilience Plan (RRP), funding is also available for the upgrade of technical building systems, specifically targeting public educational institutions and residential and care facilities for the elderly and persons with disabilities. The energy renovation of healthcare infrastructure buildings of particular relevance due to COVID-19 is also continuing within the framework of the React-EU initiative. To encourage investment in the energy renovation of public buildings, it is necessary to ensure the continued availability of non-repayable funds and to support the preparation of projects through both secured and additional resources from the European Local Energy Assistance (ELENA) facility for international technical assistance.

For the implementation of energy efficiency and renewable energy measures, non-repayable financial support is also provided to the public sector by the Eco Fund. In addition to non-repayable funds, loans are available to support the reduction of energy consumption and GHG emissions and the increase of renewable energy production (provided by the Eco Fund and other financing institutions).

#### PROJECT OFFICE FOR THE ENERGY RENOVATION OF BUILDINGS

Since 2016, the Project Office for the Energy Renovation of Buildings (PP-EPS) has operated under the ministry responsible for energy to support and promote the renovation of public buildings. The Office allocates non-repayable financial support to the public sector, monitors the implementation of energy renovation projects for public buildings, and has also managed a project to co-finance the preparation of technical and economic documentation for energy renovation projects in buildings owned by the core and wider public sector. It also prepares and issues guidance and manuals and maintains and regularly updates the registry of buildings owned and used by the core public sector.

### M-28 ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN THE PUBLIC SECTOR

**Sectors affected by the implementation of the measure:** energy use in the public sector

#### ADDITIONAL MEASURES IN THE AREA OF PUBLIC BUILDING RENOVATION

With the aim of accelerating the preparation of comprehensive energy renovation projects for public buildings, the Project Office for the Energy Renovation of Buildings (PP-EPS) is expected to enhance its operations. This will include the provision of technical support in identifying priority projects, preparing project documentation, defining implementation models, monitoring and verifying energy savings, actively developing and promoting new financial models to encourage the renovation of public buildings and energy performance contracting, and establishing a quality assurance system for public building energy renovation projects. To ensure the effective implementation of these tasks, appropriate human and financial resources

will need to be secured.
An Action Plan for the Renovation of Public Buildings is currently being prepared under the Recovery and Resilience Plan (RRP). The plan will include an analysis of the building stock and needs in the public sector, along with specific steps for the renovation of buildings, including the identification of potential financing sources. One of the options being considered is the establishment of a systemic public funding instrument for energy renovation projects in the core — and possibly also the wider — public sector. Preparatory expert groundwork for the broader financial plan for energy renovation of public buildings is already underway within the framework of the LIFE IP CARE4CLIMATE project. The Action Plan is expected to be completed in 2025. The Long-term energy renovation strategy for 2050 (DSEPS 2050) also outlines additional activities to develop financial instruments to support the energy renovation of buildings in the core public sector. Furthermore, education and training activities for all stakeholders involved in the preparation and implementation of public building renovation projects will need to be strengthened.

**OTHER ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN THE PUBLIC SECTOR**

As part of energy management in the public sector, expert groundwork will be developed for a Long-term energy and climate strategy for the public sector, including an energy management programme. Based on this groundwork, an update to the regulation currently governing this area is planned for 2027. For state-owned buildings, energy management is to be improved. In this context, public buildings managed by the Ministry of Public Administration are to be equipped with energy monitoring systems. To reduce energy use and operating costs and to improve indoor comfort, measures will also be taken to review and optimise the functioning of existing technical building systems (Re-Co), including their operational and maintenance procedures, as well as their interaction with building users. In the area of reporting, additional technical and expert support will be provided. In the core public sector, appropriate human and financial resources will also need to be secured to ensure the effective implementation of energy management.

By 2026, an upgrade of the energy accounting system is planned. This system is expected to become a subsystem of a comprehensive information system for collecting data on the energy performance of buildings. In addition to the energy accounting subsystem, the information system will include a subsystem for the issuance and management of the energy performance certificate register, a subsystem for the preparation and maintenance of the air-conditioning inspection report register, and a subsystem for system administration and register management. The information system will also include various registers of independent experts and issuers of energy performance certificates and air-conditioning inspection reports, as well as administrators responsible for reporting energy accounting data.

## II.D.5 Energy Consumption – Transport

### M-29 PROMOTION OF SUSTAINABLE TRANSPORT – GENERAL

**Sectors affected by the implementation of the measure:** transport

This measure is intended to support the continued implementation of horizontal and soft measures covering all transport subsystems and all levels of transport planning and management. These include integrated transport planning, coordination of development in the field, the promotion of sustainable mobility, and digitalisation in transport. Integrated transport planning at the municipal level has already been well established and widely adopted through municipal Comprehensive Transport Strategies (CPS), and the preparation of regional Comprehensive Transport Strategies is also foreseen. Non-repayable financial support for the preparation of these strategies is envisaged through the European Cohesion Fund. Strategic management of the transport sector brings, in addition to reducing GHG emissions, several co-benefits: better use of transport infrastructure, reduced mobility costs for households and

public institutions, less congestion, more efficient investments, higher resident satisfaction, and lower air pollution. A comprehensive approach to transport also results in measurable improvements in quality of life of residents and strengthens the capacity of municipalities and regions to pursue successful development. The preparation and implementation of Comprehensive Transport Strategies can serve as an example for other countries. The approach is legally underpinned by the Comprehensive Transport Planning Act[84], adopted in 2022, and is well documented on the online platform for sustainable mobility[85].

The measure also includes actions to promote sustainable mobility, such as promotional and awareness-raising campaigns. Until the end of 2026, the LIFE IP CARE4CLIMATE project will continue, focusing on awareness-raising, education, and training of stakeholders, including in the field of sustainable mobility. Support is ongoing for mobility plans targeting major traffic generators. These plans promote the use of public transport and active mobility, while reducing the use of private vehicles at specific locations. Financial incentives are foreseen for the development of such mobility plans, along with mandatory expert groundwork to inform the guidelines for major traffic generators within municipal spatial planning documents.

Digitalisation in transport, such as through the development of a travel data system to support information services, is an important horizontal measure that improves the attractiveness of various mobility options. By enhancing the user experience in journey planning and execution, users are offered more appealing alternatives to private car use, thereby contributing to reductions in GHG emissions. The SiMO portal, currently focused on public transport, is a first step towards such a service that will ultimately encompass all modes of transport.

### M-30 ADDITIONAL MEASURES TO PROMOTE SUSTAINABLE TRANSPORT – GENERAL

**Sectors affected by the implementation of the measure:** transport

Additional horizontal measures are envisaged, including the development of a new approach to financing transport infrastructure, with the aim of accelerating the planning, siting, and construction of modern rail, road, cycling, and other transport infrastructure. Establishing the conditions for the uptake of sustainable forms of mobility is essential for promoting low-emission transport. This also involves assessing the basis for economic evaluation of investment projects, in order to ensure implementation of projects that demonstrably contribute to emission reductions. The aim of preparing and implementing the Social Climate Plan is to foresee measures to reduce transport poverty, primarily by improving access to public transport, thus supporting GHG emission reductions. An additional digitalisation measure is the application of technologies that enable more efficient planning and management of traffic, including public transport. By shortening travel times, users are offered more attractive alternatives to private vehicles.

### M-31 MEASURES TO REDUCE THE NUMBER OR SHORTEN THE LENGTH OF TRIPS

**Sectors affected by the implementation of the measure:** transport

This group of measures plays a key role in reducing travel demand or, at the very least, shortening travel distances. Relevant aspects include remote working, the framework for reimbursing commuting costs, and spatial planning. In some areas of the public administration, hybrid working models continue to be enabled or encouraged following the COVID-19 pandemic; however, the overall share of remote working has decreased post-pandemic. The development of clear criteria for remote working in the public administration, and the extension of existing guidelines for civil servants in central government to all public employees, could contribute to reducing commuting needs and, in turn, GHG emissions and road congestion.

[84] https://pisrs.si/pregledPredpisa?id=ZAKO8607
[85] https://www.sptm.si/gradiva/smernice

There remains a strong need for sustainable reforms to the current system for reimbursing commuting costs. These should be agreed in dialogue with social partners and aim to promote greater uptake of public transport and other forms of sustainable mobility.

The spatial distribution of activities in relation to transport infrastructure is a key determinant of proximity between destinations and of multimodal accessibility. It also plays a critical role in shaping user travel behaviour. Stronger integration between the transport and spatial planning sectors yields positive impacts at the local level (e.g. through application of the "15-minute neighbourhood" concept to promote active mobility and guide new developments along public transport corridors), as well as at the national level through implementation of polycentric development strategies and mitigation of the negative effects of daily commuting, which remains predominantly car-based. The Comprehensive Transport Planning Ac requires this cross-sectoral integration through mandatory expert inputs during the preparation of municipal spatial plans. The development of the first regional spatial plans is already underway.

### M-32 ADDITIONAL MEASURES TO REDUCE THE NUMBER OR SHORTEN THE LENGTH OF TRIPS

**Sectors affected by the implementation of the measure:** transport

Additional measures are envisaged to include the deployment of digital infrastructure to support remote working, alongside the development of regional co-working hubs aimed at enabling work closer to home. In the area of spatial planning, enhancing the national transport model through the integration of geospatial data would enable a more coherent and comprehensive approach to the siting of land-use functions and transport infrastructure.

### M-33 PROMOTION OF PUBLIC PASSENGER TRANSPORT

**Sectors affected by the implementation of the measure:** transport

The continued implementation of the railway network upgrade remains essential to promote low-carbon mobility by rail. Ensuring compliance with TEN-T standards on the core network and improving capacity on regional railway lines—with the aim of establishing 15-minute interval services in the Ljubljana Urban Region (LUR+)—is one of the key priorities in the most traffic-congested region. This effort also includes the electrification of the railway network, construction of a second track along priority corridors outside the LUR+ area, and the upgrade of railway stations and stops at priority locations across Slovenia. Further efforts are directed towards planning and constructing multimodal passenger hubs to enable seamless transfers between different modes of transport.

In the bus transport sector, system upgrades continue with the objective of delivering an attractive and integrated urban and interurban public transport system, including both bus and rail services. A significant milestone was achieved in 2024 with the revision of concession agreements, accessibility standards, and timetables. These efforts continue with the planned integration of railway timetables. In the call for new concession contracts, the accessibility standard was increased by 20%, targeting improvements during morning and afternoon peak hours, in more remote areas, and for tourism purposes. Ongoing support is provided for the development of bus infrastructure, such as dedicated bus lanes (on both municipal and national roads), which play a vital role in reducing travel times. Enhancing the user experience in public transport is critical for increasing passenger uptake. The Integrated Public Passenger Transport (IJPP) project continues to be implemented, with the objective of connecting different modes of public transport. In 2023, the unified IJPP ticketing system was updated, and new “Slovenia” tickets were introduced, along with revised fare structures. Passengers can now choose from daily, three-day, weekly, monthly, and annual ticket options. Public passenger transport (JPP) fare subsidies remain in place. A new discount of 50% on standard ticket prices is now available for children. Weekend and family tickets have been formalised as permanent

measures. Integration with municipal transport services is still in progress. To support public transport journey planning, the SiMO portal was developed under the auspices of the Ministry of Infrastructure and the National Traffic Management Centre (NCUP). The portal is based on data available through the National Access Point (NAP) for transport data. SiMO addresses the fragmentation of information by consolidating all timetables, real-time route updates, and accessibility information into a single, user-friendly platform.

### M-34 ADDITIONAL ACTIVITIES TO PROMOTE PUBLIC PASSENGER TRANSPORT

**Sectors affected by the implementation of the measure:** transport

Strategic planning of public transport is essential to ensure an integrated and effective approach to the planning and management of public transport services. To this end, the operation of the Public Transport Management Company (DUJPP), established in 2022, is expected to be intensified. Among the planned measures is the development of a Public Passenger Transport Development Strategy. In the rail infrastructure sector, planned projects include not only upgrades to the existing rail network but also the construction of new lines, such as the Ljubljana rail hub (for freight traffic), new track sections within existing corridors, and initial preparations for a new high-speed rail connection between Ljubljana and Maribor. To support multimodal journeys, financial and technical assistance is envisaged for the development of local mobility hubs in municipalities. These hubs will facilitate the combination of various transport modes in urban areas and serve as regional interchange points, particularly near railway stations and stops. Criteria for the equipment and design of such hubs will thus be defined, and the feasibility of a unified bicycle-sharing system will be explored. Additional measures will also be taken to improve conditions for bicycle transport on trains. Improving access to public transport for currently underserved areas is essential to increasing the competitiveness of the public passenger transport system. Regular departures are a key factor in enhancing the attractiveness of public transport. The overarching goal of the rail upgrades is to introduce a fixed-interval timetable—meaning that trains, buses and other public transport services will depart at regular intervals of 30, 60 or 120 minutes, depending on the route's demand. Since the implementation of a fixed-interval timetable is partially feasible even with the current infrastructure, the measure foresees its introduction at 30-minute intervals in the LUR+ region prior to the construction of additional tracks. Following infrastructure upgrades, the target is to achieve 15-minute intervals. A fixed-interval timetable is also planned for the Maribor region. Bus service capacity is to be managed either through a reservation system or by dynamically scaling up capacity during periods of increased demand. One option for increasing capacity includes enabling the use of longer vehicles in public passenger transport. Improving the competitiveness of not only interurban but also urban public transport is also foreseen, through route optimisation, increased service frequency, and improved integration of transfer hubs. In addition to infrastructure improvements aimed at reducing travel times—such as intersection signal priority and dedicated bus lanes in urban areas—it is crucial that these are extended to suburban and peri-urban areas. For instance, with the planned expansion of two motorway branches in the wider Ljubljana area, the feasibility of using new lanes to prioritise public transport should be assessed. Enhancing the user experience in public transport will be supported through the further development of Mobility as a Service (MaaS), the definition of quality standards for public transport services, digitalisation of ticketing systems, and improved access to information for persons with functional impairments. A further measure includes promoting the provision of demand-responsive transport—transport services that adapt to user demand or operate on request—through regulatory frameworks, financial incentives, data collection, and integration into information systems. The state is already implementing a pilot project for on-demand transport for persons with reduced mobility. Additionally, public passenger transport will undergo digitalisation to enable more efficient planning of routes and schedules and to allow for real-time service monitoring.

### M-35 MEASURES TO INCREASE THE SHARE OF JOURNEYS MADE BY ACTIVE MOBILITY

**Sectors affected by the implementation of the measure:** transport

To encourage greater uptake of active mobility, a set of measures is planned to develop and improve dedicated infrastructure for pedestrians and cyclists.

The adoption and implementation of the Strategic Plan for the Development of Cycling up to 2030 is foreseen, with a draft already prepared. The objective is to establish a continuous network of high-quality cycling routes, maintain the condition of existing infrastructure, and ensure the necessary conditions for multimodal connectivity. By 2024, around 1,000 kilometres of national cycling routes had been completed, out of the planned 3,000 kilometres forming the national cycling network. Financial support is allocated for the development of pedestrian infrastructure, the inclusion of walking and cycling infrastructure concepts in spatial planning documents, the preparation of local walkability plans, and other measures aimed at promoting walking.

### M-36 ADDITIONAL MEASURES TO INCREASE THE SHARE OF JOURNEYS MADE BY ACTIVE MOBILITY

**Sectors affected by the implementation of the measure:** transport

In the area of infrastructure, additional incentives are foreseen for the development of high-quality bicycle parking facilities at major trip generators and for the construction of a network of charging stations for electric bicycles. Legislation will be prepared to introduce minimum parking standards for bicycles in new buildings, including charging infrastructure for e-bikes, in accordance with the Energy Performance of Buildings Directive. Integration of the national cycling network with the siting of new railway infrastructure is envisaged wherever feasible, taking into account the safety and maintenance requirements of the rail system. In addition, technical studies for regional spatial plans will assess the potential and impact of developing higher-capacity cycling routes in the commuting hinterlands of urban municipalities, and design concepts for such networks will be elaborated. Relevant regulations and design standards for cycling infrastructure will be revised accordingly. The objective is to encourage cycling as a mode of daily inter-municipal transport. By offering a higher level of service—including more direct routes, fewer intersections, and wider paths—the aim is to reduce travel time for daily trips and to enhance both the attractiveness and comfort of cycling. An additional set of measures to promote active mobility includes financial incentives to support commuting by active modes, a good practice already well established in many European countries. The support scheme for bicycle purchases continues, with subsidies for electric bicycles available as of 2024, alongside awareness-raising campaigns to promote walking and cycling (e.g., the national *Polni zagona* campaign). Traffic calming measures continue with the introduction of low motor traffic zones in settlements. The Comprehensive Transport Planning Act requires municipalities to develop expert baselines for the planning of traffic-calmed areas. Traffic calming measures are also underway in Alpine areas, with activities already taking place in specific Alpine valleys such as Vrata, and on mountain roads like the Vršič Pass. Following the example of many European countries, steps will be taken to assess and implement a 30 km/h speed limit in towns and settlements. This measure significantly improves safety for all road users, especially pedestrians and cyclists. Funding is already available to municipalities for implementing traffic calming measures on state roads that pass through settlements.

### M-37 MEASURES TO PROMOTE MORE SUSTAINABLE USE OF PRIVATE MOTOR VEHICLES

**Sectors affected by the implementation of the measure:** transport

Activities aimed at managing parking in urban, tourist, and protected areas continue to be

implemented and further enhanced. In 2022 and 2023, the Ministry of the Environment, Climate and Energy carried out the Sustainable Parking Policy project. As part of this initiative, national guidelines were developed for the preparation of parking policy implementation plans, along with a national strategic framework for parking policy and the groundwork for the digitalisation of parking policy implementation. The introduction of maximum parking standards remains a key measure with the potential to significantly influence the regulation of parking space availability.

### M-38 ADDITIONAL MEASURES TO PROMOTE MORE SUSTAINABLE USE OF PRIVATE MOTOR VEHICLES

**Sectors affected by the implementation of the measure:** transport

The feasibility and potential impacts of introducing a congestion charge for motor vehicle entry into Ljubljana and Maribor will be examined. The assessment will include a feasibility study, statutory solutions, and the determination of beneficiaries and intended uses of the collected revenues.

Parking management remains one of the most effective tools for influencing travel behaviour and improving the quality of urban life. As such, several supplementary measures are foreseen in the area of parking policy, including a reduction in the number of on-street public parking spaces and incentives for municipalities to develop parking policy implementation plans. For urban municipalities, the preparation of these plans will be mandatory under the Comprehensive Transport Planning Act.

A broader package of measures is also envisaged to promote more efficient use of private vehicles. These include incentives to encourage households to forgo private vehicle ownership. Planned measures to promote carpooling and increase vehicle occupancy rates include: revision of legislation to formally regulate carpooling (including provisions for legal operation and passenger safety); support for the expansion of car-sharing systems and carpooling platforms; establishment of carpool parking facilities (including statutory frameworks and financial support); integration with other types of mobility hubs; support for the development and use of digital solutions such as ride-matching applications; and the preparation of feasibility studies and statutory frameworks for introducing high-occupancy vehicle (HOV) lanes on selected motorway corridors. The expansion of car-sharing systems will also continue to be supported. As with the proposed reduction of speed limits in towns and settlements, an assessment will be conducted to explore the feasibility and impacts of lowering speed limits on motorways and expressways. The analysis will cover potential effects on GHG emissions, road safety, congestion, travel times, and related factors. The measure will be implemented in accordance with the findings of the study. In parallel, the application of the "polluter pays" principle will be examined in the context of different road pricing scenarios. Based on this analysis, a decision will be made regarding the structure and approach to road pricing in Slovenia beyond 2030. A national register of road closures will be established to enable coordinated planning of roadworks across all road infrastructure managers—DRSI, DARS, and municipalities. This will help reduce congestion and, consequently, GHG emissions.

### M-39 PROMOTION OF SUSTAINABLE FREIGHT TRANSPORT

**Sectors affected by the implementation of the measure:** transport

To enhance the efficiency of freight transport, the construction of dedicated freight infrastructure is foreseen. Owing to its location at the crossroads of the Pan-European Corridors V and X—which largely overlap with the TEN-T Core Network and Core Network Corridors—Slovenia is heavily exposed to transit freight traffic. The long-term strategic aim is to shift freight transport from road to rail. Achieving this requires the development of a modern,

reliable rail network, the construction of which is already underway. The focus is on promoting co-modality, with priority given to the construction and upgrading of existing transport infrastructure, particularly rail. Planned measures include identifying the need for the development of intermodal hubs and small-scale logistics centres, improving railway infrastructure, and completing the construction of the new double-track railway line between Divača and Koper. By 2030, the following key activities will be implemented: all sections of the TEN-T network will be modernised, upgraded, or newly constructed; the entire Slovenian railway network will be electrified; ERTMS (ETCS Level 2) will be deployed across the entire TEN-T network; and upgrades and extensions of the regional rail network will be implemented. This measure is also supported by the National Transport Development Strategy and Programme, and by non-repayable funding from EU sources. Additional actions include internalising external costs into road freight charges (e.g., road user charges) and promoting higher load factors in freight vehicles. The use of digital documentation in road freight transport will also be introduced, specifically through the implementation of the eFTI and e-CMR directives.

### M-40 ADDITIONAL MEASURES TO PROMOTE SUSTAINABLE FREIGHT TRANSPORT

**Sectors affected by the implementation of the measure:** transport

In the area of strategic planning, the integration of strategic guidance for freight transport is foreseen within the development process of the National Comprehensive Transport Strategy. At municipal level, financial support will be provided to local authorities for the preparation of urban logistics management plans. These are intended to optimise and electrify logistics operations, thereby reducing the environmental impacts of freight movements within cities and functional urban areas.

With respect to infrastructure, further upgrades are planned for the Koper freight terminal to accommodate increased freight volumes resulting from the new Divača–Koper rail connection. Additional measures will promote container handling services for combined transport operations, supported by appropriate legislative frameworks and funding in line with relevant EU directives. An assessment of needs will be conducted to encourage businesses to construct, renovate, or reactivate industrial rail sidings, with co-financing and support for accessing EU funding.

Support for the development of the rail freight market will also include a programme of financial, regulatory, and other support measures for rail freight transport.

### M-41 IMPROVEMENT OF VEHICLE EFFICIENCY AND PROMOTION OF THE USE OF LOW-$CO_2$ FUELS

**Sectors affected by the implementation of the measure:** transport

**IMPROVING VEHICLE EFFICIENCY**

This measure rests on three key pillars:

- binding targets for vehicle manufacturers to reduce $CO_2$ emissions per kilometre for new vehicles,
- raising consumer awareness about fuel consumption and vehicle emissions, and
- promoting the purchase and use of more efficient vehicles through taxation.

The European Commission first introduced binding $CO_2$ emission targets for new passenger cars in 2009. The most recent targets were adopted in 2023. By 2030, the average $CO_2$ emissions of new cars must be at least 55% lower than in 2021, while emissions from new vans must be reduced by 50%. From 2035 onwards, the registration of new vehicles emitting $CO_2$ will no longer be permitted.

In 2024, the EU adopted strengthened targets for heavy-duty vehicles, significantly tightening

previous requirements and expanding their scope to cover a broader range of vehicle types, including tractor units, city and long-distance buses, and trucks. The target for 2030 is a 45% reduction in emissions compared to the reference period from 1 July 2019 to 1 June 2020, with a further reduction to 90% by 2040.

Public information and awareness-raising activities are mainly carried out through vehicle fuel consumption labelling. Under the Decree on information relating to fuel economy, $CO_2$ emissions and pollutant emissions—which transposes Directive 1999/94/EC[86]—vehicle suppliers are required to provide consumers with data on fuel consumption and emissions at the point of sale and in promotional materials. They must also provide a guide to fuel-efficient driving and $CO_2$ emissions.

The efficient use of vehicles is further promoted through the Green Public Procurement (GPP) scheme, as both vehicles and transport services fall within its scope (see related measure M-8).

The third pillar consists of fiscal measures. The motor vehicle tax (MVT) is levied on vehicles that are placed on the market or registered for the first time in the territory of the Republic of Slovenia. In 2020, the adoption of the new Motor Vehicles Tax Act (ZDMV-1) introduced a shift in the tax base. While previously determined by engine capacity, power, and fuel type, the tax is now based solely on the $CO_2$ emissions of the vehicle, as measured using the WLTP (Worldwide Harmonised Light Vehicles Test Procedure) standard. The tax is progressive, increasing with higher $CO_2$ emission levels. As a result, vehicles with higher emissions are subject to higher taxation. However, the thresholds for higher tax rates are relatively high, meaning the tax is less effective in promoting the purchase of low-emission vehicles compared to similar measures in some other EU Member States. An annual road user charge is also applicable, calculated based on engine power, or in the case of electric vehicles, vehicle weight. The NECP 2024 includes measures to strengthen both instruments, so they more effectively encourage the uptake of more efficient and lighter vehicles (M28.3).
Additionally, a reduction in the taxable benefit for the private use of electric company vehicles is in force. The benefit has been reduced to 0% of the vehicle's purchase value per month (previously 0.3%).

**PROMOTION OF FUEL-EFFICIENT DRIVING**

In line with Directive 2003/59/EC (training of drivers) and Regulation (EC) No 1071/2009 (training of transport operators), training for drivers and operators of freight vehicle fleets is provided by authorised entities. The training includes modules on fuel-efficient driving and logistics. According to the Drivers Act (Official Gazette of the Republic of Slovenia, No. 85/2016), instruction in the basic techniques of fuel-efficient and environmentally friendly driving forms part of the practical training for learner drivers. Guidance on fuel-efficient driving is already integrated into driving courses.

**PROMOTION OF THE USE OF LOW-$CO_2$ FUELS**

The purchase of electric and alternatively fuelled vehicles, as well as the installation of charging infrastructure, was previously supported by the Eco Fund through non-repayable incentives and loans. Currently, subsidies are provided by Borzen, while the Eco Fund continues to offer loans. Subsidies are available only for electric vehicles and are determined based on the vehicle's purchase price. The full subsidy is available for vehicles priced below EUR 35,000, while vehicles above EUR 65,000 are not eligible. Support is available for both new and used electric vehicles imported into Slovenia, with lower subsidy amounts applicable to used vehicles. Subsidies are available to both private individuals and legal entities. Support is also available for light commercial vehicles and buses and will be extended to freight vehicles from

[86] Directive 1999/94/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 December 1999 on the availability of consumer information regarding fuel economy and $CO_2$ emissions in the marketing of new passenger cars.

2025.

The NECP foresees the continued promotion of the purchase of light battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs), as well as low-emission tourist coaches, through subsidies (BEVs, PHEVs and FCEVs). It also envisages an assessment of the feasibility of linking subsidies to the replacement of old fossil-fuel passenger vehicles, alongside ongoing market analysis to adjust subsidy levels in line with evolving market conditions. The NECP also includes incentives for the renewal and upgrade of railway rolling stock (both passenger and freight), as well as the introduction of new technologies, in line with EU regulation, aimed at ensuring high-quality rail services and improved energy efficiency. It further promotes the uptake of zero-emission vehicles in urban areas (e.g. battery electric and hydrogen-powered buses and taxis) alongside the necessary supporting charging and refuelling infrastructure.

In Slovenia, the blending of biofuels with fossil fuels is encouraged through an obligation on fuel distributors to meet a defined annual share of renewable energy in the transport sector. This requirement is set out in the Decree on renewable energy sources in transport[87] and applies up to and including 2030, by which time the share of renewable energy must reach 20.8%. The share of renewable energy may be achieved by distributors through the supply of biofuels meeting sustainability criteria, electricity and hydrogen from renewable sources, or a combination thereof. In line with Directive (EU) 2015/1513, the decree also limits the maximum contribution of certain conventional biofuels—those produced from cereals and other starch-rich crops, sugar crops, oil crops, and other crops cultivated on agricultural land primarily for energy use—to no more than 7% of final energy consumption in transport as of 2020.

To compensate suppliers for the additional cost of purchasing biofuels, the Decree on setting prices for certain petroleum products allows the inclusion of a bio-component surcharge in the regulated fuel price calculation. This enables suppliers to partially pass biofuel-related costs on to end-users through the final fuel price.

### M-42 ADDITIONAL ACTIVITIES TO IMPROVE VEHICLE EFFICIENCY AND PROMOTE THE USE OF LOW-$CO_2$ FUELS

**Sectors affected by the implementation of the measure:** transport

Additional activities outlined in NECP 2024 include:

- Promoting the transition to low- and zero-emission vehicles: planned measures include the implementation of public calls and tenders to co-finance studies, demonstration projects, and promotion activities in support of the transition to alternative fuels in transport. Incentives are foreseen to support the replacement of fossil fuel-powered freight vehicles with vehicles powered by alternative fuels by 2030. Slovenia will also raise its targets for the share of clean and zero-emission vehicles in green public procurement beyond 2025. In addition, it is planned to align the maximum permissible weight of electric vehicles that may be driven with a category B driving licence, in accordance with EU legislation.
- Promoting the deployment of charging and refuelling infrastructure for alternative fuels in transport: an updated strategy will be prepared for the development of the alternative fuels market and infrastructure in the transport sector, including an action plan to accelerate the transition. This will encompass the identification of suitable locations for high-power charging hubs, the establishment of an information system for real-time data exchange on charging infrastructure, and the provision of refuelling infrastructure for various alternative fuels (e.g. hydrogen, LNG) across road, maritime and aviation transport. Support is also foreseen for fast-charging stations for electric vehicles along key transport corridors, hydrogen refuelling infrastructure, a platform to support

[87] Official Gazette RS, Nos. 208/21, 93/12 and 70/12.

emission-free mobility, and the integration of renewable energy sources. In parallel, legislation on charging infrastructure will be updated, accompanied by support measures such as energy storage systems to reduce grid impacts.

- Increasing the share of renewable energy in transport: tightening of requirements for achieving the renewable energy share or reducing the emission intensity of fuel distributors, in accordance with applicable EU legislation. Preparation of an analysis of existing and potential new incentives (including excise duties) to promote greater use of biofuels in transport (see also measure M-4).
- Other measures to reduce emissions in the transport sector: preparation of the groundwork and subsequent implementation of low-emission or zero-emission zones, which restrict access for the most polluting vehicles. Introduction of particle number measurement as part of periodic technical inspections, in line with the European Commission recommendation of 20 March 2023. Awareness-raising activities targeting the public on the adverse impacts of illegal modifications to vehicle exhaust systems.

## II.D.6 Industrial Processes

### M-43 REDUCTION OF F-GAS EMISSIONS FROM STATIONARY EQUIPMENT

**Sectors affected by the implementation of the measure:** industrial processes

The reduction of F-gas emissions from stationary equipment is influenced by the implementation of the provisions of Regulation (EU) No 517/2014 on fluorinated GHG and related implementing regulations. The main impact of the Regulation lies in the restriction of F-gas placing on the EU market through a quota system and the limitation of the use of F-gases with high global warming potential in equipment. The Regulation and implementing acts also govern the handling of equipment containing F-gases, with the aim of reducing leakage and ensuring appropriate treatment of F-gases. In 2024, a new F-gas Regulation (Regulation (EU) 2024/573) was adopted, introducing a more rapid phase-down of quotas, expanding the quota system to new applications using F-gases, extending the scope of the Regulation to additional equipment types and gases, improving monitoring, and restricting the production of F-gases within the EU.

Implementation in Slovenia is defined by the Decree on the use of fluorinated GHG and ozone-depleting substances (Official Gazette of the Republic of Slovenia, No. 60/2016).

The implementation of this measure will contribute to a significant reduction in HFC emissions.

### M-44 REDUCTION OF F-GAS EMISSIONS FROM MOBILE AIR-CONDITIONING SYSTEMS

**Sectors affected by the implementation of the measure:** industrial processes

Directive 2006/40/EC of the European Parliament and of the Council relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EEC (OJ L 161 of 14 June 2006), was transposed into national legislation through Technical Specification TSV – 161/01 on emissions from air-conditioning systems in motor vehicles. The specification applies to emissions from air-conditioning systems in M1 and N1 vehicle categories (passenger cars and light-duty vehicles up to 3.5 tonnes gross vehicle weight). The directive was implemented in three phases. The final phase entered into effect on 1 January 2017, prohibiting the registration of any vehicle equipped with an air-conditioning system containing fluorinated GHGs with a global warming potential (GWP) above 150.

## II.D.7 Agriculture

### M-45 IMPROVEMENT OF LIVESTOCK PRODUCTION EFFICIENCY

**Sectors affected by the implementation of the measure:** agriculture

Improving livestock production efficiency contributes to reducing the emission intensity of methane and nitrous oxide. This measure includes several instruments, which can be grouped into three categories: 1) the provision of public livestock services, which support the genetic selection of cattle and small ruminants aimed at more efficient production and reduced GHG emission intensity; 2) agricultural advisory services; and 3) incentives for the implementation of above-standard agricultural practices under the Strategic Plan of the Common Agricultural Policy. The measure includes financial incentives for the implementation of planned feeding strategies for cattle, small ruminants, and pigs, based on forage analysis, as well as the use of feed additives to reduce enteric methane emissions. Within the scope of public livestock services, the *Govedo* information system is maintained, which supports dairy farmers in decision-making processes aimed at lowering GHG emissions and provides information on emission levels at the farm level. This is an existing measure that is continuously updated based on implementation plans.

### M-46 PROMOTION OF LOW-EMISSION LIVESTOCK SYSTEMS

**Sectors affected by the implementation of the measure:** agriculture

GHG emissions from manure management can be reduced by changing livestock rearing practices. This primarily includes pasture-based systems for herbivorous animals and the production of biogas from livestock manure. Pasture-based systems help avoid methane emissions that would otherwise occur during manure storage. They also contribute to reducing indirect nitrous oxide emissions and emissions associated with the use of fossil fuels for forage harvesting and transport in housed systems. The expansion of pasture-based systems is supported through the public agricultural advisory service and interventions under the Strategic Plan of the Common Agricultural Policy, including support for improving animal welfare, incentives for organic farming, and alpine grazing schemes. The Strategic Plan also foresees investments in micro-biogas facilities, which reduce methane emissions from manure and support the use of renewable energy sources. Support is also provided for investments in modern livestock housing and manure storage facilities that reduce ammonia emissions and, as a result, indirect nitrous oxide emissions (e.g., low-emission barns and covered slurry storage). This is an existing measure that is continuously updated based on implementation plans.

### M-47 EFFICIENT NITROGEN FERTILISATION OF AGRICULTURAL CROPS

**Sectors affected by the implementation of the measure:** agriculture

Efforts in this area focus on the more efficient use of both mineral and livestock-based fertilisers. This enables the maintenance—or even increase—of agricultural output with reduced nitrogen input, while lowering both direct nitrous oxide emissions from agricultural soils and indirect emissions associated with nitrogen losses. Agricultural policy supports emission reductions through interventions under the Strategic Plan of the Common Agricultural Policy — including incentives for low-emission fertilisation practices, stubble greening, legume cultivation, organic farming, integrated production methods, precision fertilisation, and co-financing of investments in equipment for more efficient use of nitrogen fertilisers — as well as through the financing of the public agricultural advisory service, which also provides support in the areas of crop fertilisation and fertilisation planning. In addition to general interventions aimed at improving the efficiency of nitrogen fertiliser use, the Strategic Plan under the Common Agricultural Policy also promotes the use of urease, nitrification, and denitrification inhibitors. These are practices aimed at directly reducing nitrous oxide emissions. The measure Efficient nitrogen fertilisation of agricultural crops is already in place and is continuously updated based on implementation plans.

### M-48 TRANSITION TO A RESILIENT AND SUSTAINABLE FOOD SYSTEM

**Sectors affected by the implementation of the measure:** agriculture

This measure encompasses activities aimed at transitioning towards a more sustainable food system. It focuses on increasing the share of locally produced food, promoting the production and consumption of plant-based food, introducing additional measures to boost organic food production, and implementing actions to reduce food waste.

## II.D.8 Land Use, Land-Use Change and Forestry (LULUCF)

### M-49 SUSTAINABLE FOREST MANAGEMENT

**Sectors affected by the implementation of the measure:** LULUCF

Slovenia implements a policy of sustainable forest management that is grounded in close-to-nature principles, environmental protection, and multifunctional forest use. This approach is aligned with the Act on Forests and the National Forest Programme and supports the enhancement of carbon sinks in the LULUCF sector. Forest management is based on forest management plans developed by the Slovenia Forest Service. These plans determine the maximum allowable harvest, taking into account the sustainable capacity of forests.

In November 2023, the Government of the Republic of Slovenia adopted regional forest management and hunting management plans for the 2021–2030 period. These plans set the maximum annual allowable harvest at 7.6 million cubic metres, equivalent to 86% of the annual forest growth. The main objectives of the plans include adjusting tree species composition, maintaining and increasing carbon sequestration in forests, and improving the productive potential of forest sites. A particular focus is placed on promoting active forest management in privately owned forests, which constitute the majority of Slovenia’s forested areas.

Slovenia offers forest owners a range of financial incentives, including support for forest tending and protection, reforestation and restoration following natural disasters, maintenance and construction of forest infrastructure, and the purchase of modern harvesting and timber extraction machinery. Additional emphasis is placed on enhancing fire prevention measures in forests. Education and training for forest owners on sustainable forest management practices are also a key component, delivered by the Slovenia Forest Service. In recent years, particular emphasis has also been placed on collecting data on forest conditions using modern digital tools, supporting more effective planning and implementation of measures.

The financing of these measures is secured through various sources, including the general budget of the Republic of Slovenia, the Forest Fund, the Strategic Plan of the Common Agricultural Policy 2023–2027, among others. The total value of these measures—including investments in primary wood processing and the development of forest nurseries—is estimated at over EUR 55 million for the 2025–2030 period. Sustainable forest management remains a key measure for maintaining or increasing carbon sinks in the LULUCF sector. Going forward, greater emphasis will be placed on climate change adaptation, strengthening forest resilience, and optimising the use of wood in final products that enable long-term carbon storage.

### M-50 OTHER ACTIVITIES TO REDUCE EMISSIONS AND ENHANCE CARBON SINKS IN THE LULUCF SECTOR

**Sectors affected by the implementation of the measure:** LULUCF

Other activities aimed at reducing emissions and increasing removals in the LULUCF sector, introduced as new instruments in the updated Integrated National Energy and Climate Plan, include: promoting investments in primary wood processing, encouraging the use of wood in

building construction and renovation, limiting the net annual increase in artificial land cover, and curbing the conversion of designated forest land. As part of its industrial strategy, Slovenia has set the objective of processing at least 3 million m³ of roundwood for non-energy uses by 2030. The majority of these investments will be funded through the Recovery and Resilience Plan. Including private contributions, total expenditures for the 2025–2030 period are estimated at around EUR 70 million. Slovenia is also fostering increased use of wood in the construction sector. In line with NECP targets, the aim is to raise the share of wood used in public buildings to 40% by 2030. Emissions resulting from land development and the reduction of designated forest areas can be reduced through targeted spatial planning policies. Key roles are played by the assessment and planning procedures concerning land-use changes within municipal spatial plans.

Future trends in emissions and removals in the sector will also be shaped by the restoration or enhancement of carbon-rich natural ecosystems. This includes the restoration of ecosystems such as peatlands, wetlands, shrublands, grasslands, and forest habitat types. The measure is aligned with the Natura 2000 Management Programme for the 2023–2028 period. The estimated value of this measure for the 2025–2030 period is approximately EUR 10 million, to be financed through the national budget, EU funds (e.g. LIFE and the European Agricultural Fund for Rural Development), and private sector sources.

Slovenia is also pursuing efforts to improve regulations for the protection and conservation of agricultural land, as well as for the preservation and enhancement of soil quality. However, the overall impact of these measures is expected to be significantly smaller compared to other interventions. In this context, the development of a monitoring framework to assess the effects of nature conservation measures on agricultural land and soils is noteworthy. These measures generate synergies in both climate change mitigation and biodiversity preservation, as evidenced by numerous studies and the findings of international projects.

## II.D.9 Waste

**M-51 REDUCTION OF WASTE GENERATION AND PROMOTION OF REUSE AND RECYCLING**
**Sectors affected by the implementation of the measure**: waste management

The Waste Prevention Programme of the Republic of Slovenia, adopted in 2022, includes the following measures:

- Reducing municipal waste generation in households, primarily through public information and awareness campaigns;
- Reducing household waste from plastic bags, by introducing a monitoring system for the consumption of lightweight plastic bags;
- Reducing food waste, through targeted communication and awareness-raising along the food supply and preparation chain, promoting changes in eating habits, and identifying ways to reduce food waste in the hospitality sector;
- Reducing waste electrical and electronic equipment, through targeted communication and awareness measures and the establishment of infrastructure for collection and preparation for reuse;
- Reducing plastic waste and single-use plastic products, by restricting market access, introducing product design requirements (e.g., for bottles), and setting targets to reduce consumption;
- Reducing bulky waste, through incentives for reuse, enabling preparation for reuse, and public awareness initiatives;
- Reducing textile waste and discarded clothing, by promoting the reuse of clothing and encouraging collaboration among stakeholders along the textile value chain;

- Reducing waste generation in the public sector, through product inventory management, extending product use, awareness-raising, and the implementation of green public procurement.

### M-52 LANDFILL GAS RECOVERY

**Sectors affected by the implementation of the measure**: waste management

All landfill operators were required to implement landfill gas recovery systems by the end of 2005. In 2021, 2.7 kt of methane were recovered, representing 25% of the methane generated at landfills. The majority of the recovered landfill gas is used for electricity generation.

### M-53 REDUCTION IN THE LANDFILLING OF BIODEGRADABLE WASTE

**Sectors affected by the implementation of the measure:** waste management

By 2016, all landfills were required to introduce technologies for the improved treatment of municipal waste, including the stabilisation of biodegradable waste, in accordance with the Decree on waste landfill. Implementation of this measure has resulted in a significant decrease in the quantity of biodegradable waste disposed of in landfills, thereby reducing methane emissions.

### M-54 URBAN WASTEWATER MANAGEMENT

**Sectors affected by the implementation of the measure**: waste management

Slovenia is obliged to implement measures for the management of urban wastewater in accordance with Council Directive 91/271/EEC concerning urban wastewater treatment. To this end, the Republic of Slovenia adopted the Operational Programme for the Collection and Treatment of Urban Wastewater in 2020 (hereinafter: the Operational Programme). The Operational Programme is one of the key implementation instruments for achieving water protection objectives related to pollution caused by discharges of urban wastewater. It sets out measures to ensure compliance with infrastructure requirements and to improve the level of service for the collection and treatment of urban wastewater. The implementation of the programme is expected to support a gradual increase in the share of the population connected to well-managed public sewerage systems, reduce the number of septic tanks, and contribute to the upgrading of urban wastewater treatment plants. The overarching objective of the measures is to ensure that the majority of urban wastewater is collected and adequately treated in wastewater treatment plants, where all methane generated during the treatment process is captured and subsequently utilised in combined heat and power (CHP) units for electricity and heat production, flared, or repurposed for other uses.

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CROSS-SECTORAL MEASURES** | | | | | | | | | | | | |
| M-1 | EU EMISSIONS TRADING SCHEME (EU ETS) | GHG emissions trading system The EU-wide emissions cap is reduced in line with the EU trajectory. | Reduction of GHG emissions in high-emitting sectors | $CO_2$, | Economic, Regulatory | Implemented | 2005 | 1.A.1, 1.A.2, 2 | MECE | WM | NE | M-1 |
| M-2 | EXPANSION OF THE EU ETS (ETS2 OR BRT) | Extension of the GHG emissions trading scheme to cover fuel combustion in buildings (households and services), road transport, and energy use in industry not included in ETS1. | Reduction of GHG emissions in high-emitting sectors | $CO_2$, | Economic, Regulatory | Planned | 2027 | 1.A.2, 1.A.3, 1.A.4 (a, b) | MECE | WAM | NE | / |
| M-3 | ENVIRONMENTAL TAX ON AIR POLLUTION FROM $CO_2$ EMISSIONS | Restructuring of the environmental tax into a dedicated levy | Reduction of emissions and internalisation of external costs resulting from $CO_2$ emissions | $CO_2$ | Fiscal | Implemented | 1997 | 1.A | MECE | WM | NE | M-2 |
| M-4 | TAXES AND LEVIES ON ENERGY CONTRIBUTING TO EMISSION REDUCTIONS | Taxation of energy products and electricity through excise duties, environmental levies and contributions | Promotion of the competitiveness of environmentally friendly fuels | $CO_2$ | Fiscal | Implemented | 1998 | 1.A | MECE, MF, METS | WM | NE | M-3 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-5 | CHANGES TO THE ENVIRONMENTAL TAX, AND TO TAXES AND LEVIES | Promotion of the transition to sustainable energy sources and greater energy efficiency through changes in environmental taxes and levies | Internalisation of external costs of $CO_2$ emissions and promotion of the competitiveness of environmentally friendly fuels | $CO_2$ | Fiscal | Planned | 2025 | 1.A | MECE, MF, METS | WAM | NE | M-4 |
| M-6 | USE OF BEST AVAILABLE TECHNIQUES – ENVIRONMENTAL PERMITS | Regulation of emissions through emission limit values in environmental permits and the promotion of best available techniques (BAT) | Reduction of energy use and emissions through the application of BAT | $CO_2$, PFC | Legislative | Implemented | 2010 | 1.A.2, 2., 3. | MECE | WM | NE | M-5 |
| M-7 | EDUCATION, TRAINING, AWARENESS RAISING, COMMUNICATION AND PROMOTION | Various actors (government and non-governmental sectors, the media, businesses, professional institutions, etc.) implement activities related to climate change mitigation education and awareness. | Support for climate change mitigation measures | $CO_2$, $CH_4$, $N_2O$ | Education, Awareness, Information | Implemented | 2002 | 1., 2., 3., 4.,5. | MECE | WM | NE | M-6 |
| M-8 | GREEN PUBLIC PROCUREMENT | Green public procurement promotes the purchase of environmentally friendly goods, services and | Increase in the share of green public procurement and energy-efficient concessions | $CO_2$ | Legislative, Other | Implemented | 2018 | 1.A.4.a | MPA, MECE | WM | NE | M-8 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | construction, thereby reducing the environmental footprint of the public sector. | | | | | | | | | | |
| M-9 | ENERGY LABELLING AND MINIMUM STANDARDS | Setting requirements for the environmental design of products and informing consumers through energy labelling | Improvement of the energy efficiency of appliances | $CO_2$ | Legislative, Informational | Implemented | 2002 | 1.A.4 1.A.3 | MECE | WM | NE | M-9 |
| M-10 | OBLIGATIONS OF ENERGY SUPPLIERS TO ACHIEVE ENERGY SAVINGS AMONG FINAL CONSUMERS | Obligation for energy suppliers to implement energy efficiency and renewable energy measures for final consumers in accordance with the EED | Increase in final energy consumption efficiency | $CO_2$ | Legislative, Economic | Implemented | 2011 | 1.A.2, 1.A.3, 1.A.4 (a, b) | MECE, Energy Agency, Energy suppliers | WM | NE | M-10 |
| M-11 | MANAGEMENT OF FOSSIL FUEL SUBSIDIES | Gradual reduction of direct and indirect incentives for fossil fuel use | Reduction of financial incentives for fossil fuels | $CO_2$ | Economic, Legislative | Planned | 2027 | 1.A.3, 1.A.2, 1.A.4.c | MECE, MF, MI, MAFF, METS | WAM | 300 | / |
| M-12 | NEW FINANCIAL INSTRUMENTS FOR THE TRANSITION TO A LOW-CARBON SOCIETY | New or upgraded financial instruments and support measures for implementers/investors to promote the transition to a low-carbon society | Accelerate the development of energy efficiency and renewable energy investments; improve the capacity of measure | $CO_2$ | Economic, Informational, Educational | Adopted | 2024 | 1.A.4.a, 1.A.4.b, 1.A.3, 1.A.1 | MECE | WM | NE | / |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | developers and implementers | | | | | | | | | |
| M-13 | MEASURES IN THE FIELD OF RESEARCH, INNOVATION AND COMPETITIVENESS FOR THE GREEN GROWTH OF THE ECONOMY | Measures in the field of research, innovation and competitiveness for the green growth of the economy | Enable the transition to a low-carbon society | $CO_2$ | Economic, Educational | Planned | 2025 | 1.A.2, 1.A.4, 1.A.3 | MHESI, METS, MF, MECE, ME | WAM | NE | / |
| M-14 | IMPROVEMENT OF SPATIAL PLANNING TO SUPPORT THE IMPLEMENTATION OF EE AND RES MEASURES | Activities to improve the integration of energy efficiency (EE) measures, the deployment of renewable energy sources (RES), and low-carbon sources into spatial planning at all levels | Improvement of the implementation of EE measures and the use of RES and low-carbon sources through enhanced spatial integration | $CO_2$ | Planning, Legislative | Planned | 2025 | 1.A.1, 1.A.3, 1.A.2, 1.A.4 | MECE, MNRSP, municipalities | WAM | NE | / |
| **ENERGY SUPPLY** | | | | | | | | | | | | |
| M-15 | COAL PHASE-OUT | Coal phase-out in electricity generation | Reduction of $CO_2$ and other GHG emissions | $CO_2$ | Economic, Legislative | Implemented | 2020 | 1.A.1 | MECE | WM | NE | M-11 M12 |
| M-16 | PROMOTION OF ELECTRICITY PRODUCTION FROM RES AND | Promotion through support schemes, incentives for self-supply, investment | Increase in the production of electricity and heat | $CO_2$ | Economic, Legislative | Implemented | 2020 | 1.A.1 | MECE, Borzen, AGEN- | WM | NE | M-13 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HIGH-EFFICIENCY COGENERATION OF ELECTRICITY AND HEAT | incentives, as well as other incentives for the production of RES and CHP (e.g. mandatory share of heat from RES) | from RES and in CHP units | | | | | | RS, ELES | | | |
| M-17 | ADDITIONAL MEASURES TO PROMOTE ELECTRICITY PRODUCTION FROM RES AND HIGH-EFFICIENCY COGENERATION OF ELECTRICITY AND HEAT | Increase in the production of electricity and heat from RES and in CHP units | Increase in the production of electricity and heat from RES and in CHP units | $CO_2$ | Economic, Legislative | Planned | 2021 | 1.A.1 | MECE, Borzen, AGEN-RS, ELES | WAM | 454 | M-14 |
| M-18 | SUPPORT FOR THE DEVELOPMENT OF LOCAL ENERGY COMMUNITIES AND RENEWABLE ENERGY COMMUNITIES | Increase in the supply of electricity and heat from renewable energy sources (RES) | Increase in the supply of electricity and heat from renewable energy sources (RES) | $CO_2$ | Economic, Legislative | Implemented | 2023 | 1.A.1 | MECE | WM | NE | M-15 |
| M-19 | PROMOTION OF DISTRICT HEATING PRODUCTION FROM | Obligation for district heating (DH) systems to achieve a required share of heat supplied from RES, CHP, or | Increase in the use of RES, CHP and waste heat in district | $CO_2$ | Economic, Legislative | Implemented | 2014 | 1.A.1 | MECE | WM | NE | M-16 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RENEWABLE ENERGY SOURCES AND HIGH-EFFICIENCY CHP | waste heat, together with incentives to support heat production from these systems | heating and cooling systems | | | | | | | | | |
| M-20 | ADDITIONAL MEASURES TO PROMOTE DISTRICT HEATING PRODUCTION FROM RENEWABLE ENERGY SOURCES AND HIGH-EFFICIENCY CHP | Integration of DHC system planning into municipal spatial plans; revision of heat pricing models; improved utilisation of geothermal energy in DHC systems; and additional activities to strengthen the enabling environment for DHC | Further increase in the use of RES, high-efficiency CHP, and waste heat in district heating and cooling systems | $CO_2$ | Economic, Regulatory, Planning, Educational | Planned | 2025 | 1.A.1 | MECE | WAM | IE (M-18) | M-17 |
| **ENERGY CONSUMPTION – INDUSTRY** | | | | | | | | | | | | |
| M-21 | PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN INDUSTRY | Promotion of the green technological transition by directing funding towards energy efficiency, renewable energy sources, low-carbon technologies, and circularity | Increase in energy efficiency and use of renewable energy sources in industry | $CO_2$ | Economic, Legislative | Implemented | 2007 | 1.A.2 | METS, MECE, Eco Fund, SID Bank | WM | NE | M-18 |
| M-22 | ADDITIONAL ACTIVITIES TO PROMOTE | Additional financial incentives for energy efficiency, renewable | Further increase in energy efficiency and use of | $CO_2$ | Economic, Legislative | Planned | 2025 | 1.A.2 | METS, MECE, | WAM | 488 | M-19 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN INDUSTRY | energy sources, low-carbon technologies, circularity, and technical assistance; incentive scheme combining various financial instruments | renewable energy sources in industry | | | | | | Eco Fund | | | |
| **ENERGY CONSUMPTION – BUILDINGS** | | | | | | | | | | | | |
| M-23 | PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN BUILDINGS – GENERAL | Promotion of the renovation of cultural heritage buildings and energy performance contracting; ensuring the quality of energy renovation projects | Increase in building energy efficiency and use of renewable energy sources for heating | $CO_2$ | Economic, Regulatory, Educational, Informational | Implemented, Adopted | 2002 | 1.A.4 | MECE, MNRSP, MC, MCRD | WM | NE | M-20 |
| M-24 | ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN BUILDINGS – GENERAL | Promotion of comprehensive building renovation, phase-out of fossil fuel use for heating in buildings, and development of active buildings | Increase in building energy efficiency and use of renewable energy sources for heating | $CO_2$ | Economic, Regulatory, Educational, Informational | Planned | 2026 | 1.A.4 | MECE, MF, MNRSP, MSF | WAM | 95 | M-21 |
| M-25 | PROMOTION OF ENERGY EFFICIENCY | Continued promotion of energy efficiency and renewable energy | Increase in energy efficiency and use of renewable energy | $CO_2$ | Economic, Regulatory, | Implemented | 1993 | 1.A.4 | MECE, Eco | WM | NE | M-22 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AND THE USE OF RENEWABLE ENERGY SOURCES IN HOUSEHOLD | measures in households through repayable and non-repayable incentives, operation of the ENSVET energy advisory network, and implementation of measures to reduce energy poverty | sources in households | | Informational | | | | Fund, MSF | | | |
| M-26 | ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN HOUSEHOLDS | Establishment of a project office for comprehensive renovation of residential buildings; implementation of measures to reduce barriers to the renovation of multi-apartment buildings and pilot projects; renovation of publicly owned housing | Increase in energy efficiency and use of renewable energy sources in households | $CO_2$ | Economic, Regulatory, organisational, Informational | Planned | 2026 | 1.A.4 | MECE, Eco Fund, MNRSP, MSF | WAM | IE (M-24) | M-23 |
| M-27 | PROMOTION OF ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN THE PUBLIC SECTOR | Continuation of energy management, operation of the project office, and promotion of energy efficiency and renewable energy measures in the public sector through | Increase in energy efficiency and use of renewable energy sources in the public sector | $CO_2$ | Economic, Organisational, Informational | Implemented | 2007 | 1.A.4 | MECE, MPA | WM | NE | M-24 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | repayable and non-repayable incentives | | | | | | | | | | |
| M-28 | ADDITIONAL MEASURES TO PROMOTE ENERGY EFFICIENCY AND THE USE OF RENEWABLE ENERGY SOURCES IN THE PUBLIC SECTOR | Expansion of the project office's responsibilities, upgrade of the energy management system, and preparation and implementation of an action plan for the renovation of public buildings | Increase in energy efficiency and use of renewable energy sources in the public sector | $CO_2$ | Economic, Organisational, Educational, Research | Planned | 2026 | 1.A.4 | MECE, MPA, MF | WAM | IE (M-24) | M-25 |
| **ENERGY CONSUMPTION – TRANSPORT** | | | | | | | | | | | | |
| M-29 | PROMOTION OF SUSTAINABLE TRANSPORT – GENERAL | The measure is aimed at continuing the implementation of horizontal, soft measures covering all transport sub-systems and levels of transport planning and management. | Sustainable transport planning at the municipal level, coordination of sustainable mobility development, and awareness-raising to encourage changes in travel behaviour | $CO_2$ | Economic, Planning, Legislative | Implemented | 2015 | 1.A.3 | MECE, MI, MNRSP, municipalities | WM | NE | M-26 |
| M-30 | ADDITIONAL MEASURES TO PROMOTE SUSTAINABLE TRANSPORT – GENERAL | The measure is aimed at intensifying the implementation of horizontal, soft measures covering all transport sub-systems and levels of transport | Sustainable transport planning at regional and national levels; reduction; revised assessment of investment projects | $CO_2$ | Awareness-raising, Educational, Legislative, Other | Planned | 2025 | 1.A.3 | MECE, MI, MNRSP, MF, municipalities | WAM | 407 | M-27 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | planning and management. | | | | | | | | | | |
| M-31 | MEASURES TO REDUCE THE NUMBER OR SHORTEN THE LENGTH OF TRIPS | This group of measures plays a key role in reducing travel demand or, at the very least, shortening travel distances. This is why remote working arrangements, methods of commuting cost reimbursement, and spatial planning all play an important role. | Promotion of remote working, reimbursement of commuting costs, and spatial planning | $CO_2$ | Legislative, Economic, Other | Implemented, Adopted | 2020 | 1.A.3 | MLFSA, MPA, MF, MECE, MNRSP, municipalities | WM | NE | / |
| M-32 | ADDITIONAL MEASURES TO REDUCE THE NUMBER OR SHORTEN THE LENGTH OF TRIPS | This group of measures plays a key role in reducing travel demand or, at the very least, shortening travel distances. Additional measures are planned to promote remote working. | Infrastructure to support remote working (digital infrastructure, co-working spaces) | $CO_2$ | Economic | Planned | 2025 | 1.A.3 | MLFSA, MECE, MI, MPA, METS | WAM | IE (M-31) | / |
| M-33 | PROMOTION OF PUBLIC PASSENGER TRANSPORT | The measures aim to improve the services and attractiveness of public passenger transport, with a focus on adequate (particularly rail) infrastructure, better conditions for | Increase in the use of public passenger transport | $CO_2$ | Economic, Legislative, Informational | Implemented, Planned | 1991 | 1.A.3 | MI, MECE, MNRSP, municipalities | WM | NE | M-28 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | combining different transport modes, improved user experience, and competitiveness compared to private cars. | | | | | | | | | | |
| M-34 | ADDITIONAL ACTIVITIES TO PROMOTE PUBLIC PASSENGER TRANSPORT | Additional measures aim to improve the services and attractiveness of public passenger transport, with a stronger focus on strategic planning, multimodality, enhanced user experience, and competitiveness compared to private cars. | Further increase in the use of public passenger transport | $CO_2$ | Economic, Legislative, Other | Adopted, Planned | 2025 | 1.A.3 | MI, MECE, MNRSP, SŽ, DARS, municipalities | WAM | 37 | M-28 |
| M-35 | MEASURES TO INCREASE THE SHARE OF JOURNEYS MADE BY ACTIVE MOBILITY | The measure aims to improve conditions for active mobility (walking, cycling), through both infrastructure improvements and promotional and awareness-raising measures. | Increase in the use of active modes of mobility (cycling and walking) | $CO_2$ | Economic, Planning, Awareness-raising, Other | Implemented, Planned | 2025 | 1.A.3 | MI, MECE, municipalities | WM | NE | M-33 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-36 | ADDITIONAL MEASURES TO INCREASE THE SHARE OF JOURNEYS MADE BY ACTIVE MOBILITY | The measure aims to improve conditions for active mobility. In addition to infrastructure and awareness-raising, it focuses on calming motorised traffic to enhance safety and comfort for non-motorised road users. | Further increase in the use of active modes of mobility (cycling and walking) | $CO_2$ | Economic, Legislative, Other | Adopted, Planned | 2025 | 1.A.3 | MECE, MI, MF, MNRSP, municipalities | WAM | IE (M-31) | M-33 |
| M-37 | MEASURES TO PROMOTE MORE SUSTAINABLE USE OF PRIVATE MOTOR VEHICLES | The measure aims to increase the efficiency of car use in terms of occupancy and ownership, while reducing car use for trips where alternatives are available (e.g. short distances or routes along public transport corridors), acknowledging that cars will remain an important part of mobility and accessibility for much of the population. | Parking policy and implementation of the user-pays principle | $CO_2$ | Economic, Planning, Other | Adopted, Planned | 2025 | 1.A.3 | MECE, municipalities | WM | NE | / |
| M-38 | ADDITIONAL MEASURES TO PROMOTE MORE SUSTAINABLE | The aim of the additional measures is to intensify the implementation of transport demand | Reduction in car use and increase in vehicle occupancy | $CO_2$ | Economic, Legislative, Other | Adopted, Planned | 2025 | 1.A.3 | MECE, MI, DARS, | WAM | 348 | M-27 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USE OF PRIVATE MOTOR VEHICLES | management and to reduce the attractiveness of private motorised transport compared to alternative modes of mobility, while also improving the safety of all road users. The measures also aim to ensure a more balanced and fair distribution of the burdens (external costs) generated by car users. | | | | | | | municipalities | | | |
| M-39 | PROMOTION OF SUSTAINABLE FREIGHT TRANSPORT | The aim of the measure is to reduce emissions from freight transport through two approaches – promoting rail freight transport (via investments in rail infrastructure) to increase the share of freight transported by rail, and improving the efficiency of road freight transport to increase vehicle load factors. Strong | Improvement of freight transport infrastructure with the objective of increasing rail freight volumes | $CO_2$ | Economic, Legislative, Other | Adopted, Planned | 2025 | 1.A.3 | MI, MECE | WM | NE | M-30 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | emphasis is placed on co-modality. | | | | | | | | | | |
| M-40 | ADDITIONAL MEASURES TO PROMOTE SUSTAINABLE FREIGHT TRANSPORT | The aim of the additional measures is to adopt a strategic approach to promoting sustainable freight transport and to implement further infrastructure and fiscal measures to support the development of rail freight. | Significant improvement of freight transport infrastructure with the objective of increasing rail freight volumes | $CO_2$ | Economic, Legislative, Other | Planned | 2025 | 1.A.3 | MI, MECE, SŽ, municipalities | WAM | 98 | M-30 |
| M-41 | IMPROVEMENT OF VEHICLE EFFICIENCY AND PROMOTION OF THE USE OF LOW-$CO_2$ FUELS | $CO_2$ emission requirements for new vehicles, incentives for electric vehicles, training in fuel-efficient driving, and support for biofuels and charging infrastructure deployment | More efficient use of existing vehicles and the purchase of more efficient and lower-emission vehicles | $CO_2$ | Economic, Legislative, Other | Implemented | 2004 | 1.A.3 | MECE, MI, MF | WM | NE | M-31 |
| M-42 | ADDITIONAL ACTIVITIES TO IMPROVE VEHICLE EFFICIENCY AND PROMOTE THE USE OF LOW-$CO_2$ FUELS | NECP 2024 includes additional measures such as incentives for the transition to low- or zero-emission vehicles, development of charging infrastructure for alternative fuels, | Additional activities to improve the efficiency of existing vehicles and support the purchase of more efficient and lower-emission vehicles | $CO_2$ | Economic, Legislative, Planning, Other | Planned | 2025 | 1.A.3 | MECE, MI, MF | WAM | 653 | M-32 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | increase in the share of renewable energy sources in transport, and emission reduction measures such as low-emission zones and particulate matter checks during vehicle inspections. | | | | | | | | | | |
| **INDUSTRIAL PROCESSES** | | | | | | | | | | | | |
| M-43 | REDUCTION OF F-GAS EMISSIONS FROM STATIONARY EQUIPMENT | Implementation of EU legislation on F-gases in stationary equipment will, through a quota system, lead to the replacement of F-gases with gases with lower GWP, while also reducing leakage and banning the use of certain gases in specific applications. | Reduction in the use of high-GWP F-gases in stationary equipment | HFC, $SF_6$ | Legislative, Educational | Implemented | 2003 | 2. | MECE | WM | NE | M-34 |
| M-44 | REDUCTION OF F-GAS EMISSIONS FROM MOBILE AIR-CONDITIONING SYSTEMS | The directive prescribes which gases may be used in mobile air-conditioning systems. | Reduction in the use of high-GWP F-gases in mobile air-conditioning systems | HFC | Legislative | Implemented | 2006 | 2. | MI | WM | NE | M-35 |
| **AGRICULTURE** | | | | | | | | | | | | |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-45 | IMPROVEMENT OF LIVESTOCK PRODUCTION EFFICIENCY | Improving livestock productivity and reducing emissions through selective breeding and improved herd management, including planned feeding strategies | Increase in cattle farming efficiency to reduce GHG emissions per unit of milk and meat produced | $CH_4$, $N_2O$ | Economic, Educational, Informational | Implemented | 1950 | 3. | MAFF | WM | 73 | M-36 |
| M-46 | PROMOTION OF LOW-EMISSION LIVESTOCK SYSTEMS | Promotion of livestock production systems characterised by low emissions (e.g. pasture-based systems, treatment of manure in biogas plants) | Reduction of methane and nitrous oxide emissions from manure management | $CH_4$, $N_2O$ | Economic, Educational, Informational | Implemented | 2004 | 3. | MAFF | WM | 18 | M-37 |
| M-47 | EFFICIENT NITROGEN FERTILISATION OF AGRICULTURAL CROPS | Systemic and targeted measures to improve nitrogen uptake from livestock manure and reduce the use of nitrogen from mineral fertilisers | Improvement of nitrogen cycling efficiency at farm level, thereby reducing nitrous oxide emissions | $N_2O$ | Economic, Educational, Informational, Research | Implemented | 2004 | 3. | MAFF | WM | 8 | M-38 |
| M-48 | TRANSITION TO A RESILIENT AND SUSTAINABLE FOOD SYSTEM | Systemic and targeted measures to support the transition to a more sustainable food system | Consumption of food with a lower carbon footprint and reduction of food waste | $CH_4$, $N_2O$ | Planning, Economic, Informational | Implemented | 2004 | 3. | MAFF, MECE, MH, MHESI, MPA | WAM | NE | / |
| **LULUCF** | | | | | | | | | | | | |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-49 | SUSTAINABLE FOREST MANAGEMENT | Sustainable forest management in accordance with the Act on Forests and the National Forest Programme | Carbon storage in forests and maintenance/increase of the carbon sink | $CO_2$ | Legislative, Planning, Educational, Economic | Implemented | 1971 | 4. | MAFF, ZGS (Slovenia Forest Service) | WM | NE | M-44 |
| M-50 | OTHER ACTIVITIES TO REDUCE EMISSIONS AND ENCHANDE CARBON SINKS IN THE LULUCF SECTOR | Promotion of primary wood processing and the use of wood in construction and renovation, sustainable land use, ecosystem restoration, and revision of regulations on the protection of agricultural land and soil quality | Carbon storage in harvested wood products, prevention of deforestation, spatial development, sustainable land use, and ecosystem restoration | $CO_2$ | Informational, Economic, Planning | Planned | 2025 | 4. | METS, MECE, MNRSP, MAFF | WAM | NE | M-45 |
| **WASTE** | | | | | | | | | | | | |
| M-51 | REDUCTION OF WASTE GENERATION AND PROMOTION OF REUSE AND RECYCLING | The measure includes the implementation of the Waste Prevention Programme, which comprises awareness-raising actions, information campaigns, promotion of reuse, and extension of product lifespans. | Reduction of the amount of waste generated | $CH_4$ | Informational, Legislative | Implemented | 2016 | 5. | MECE | WM | NE | M-41 |

| ID | Name of measure | Short description | Objective(s) | GHG affected | Type of measure | Implementation status | Start year of implementation | Sector (Common reporting format (CRF) code) | Implementing entity | Projection scenario | Estimated impact [kt $CO_2$ eq] | ID in 8th NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-52 | LANDFILL GAS RECOVERY | Landfills were required to implement landfill gas recovery systems by the end of 2005. | Reduction of methane emissions released into the atmosphere from landfills | $CH_4$ | Legislative | Implemented | 2005 | 5. | MECE | WM | NE | M-42 |
| M-53 | REDUCTION IN THE LANDFILLING OF BIODEGRADABLE WASTE | In accordance with the Decree on waste landfill, all landfills were required to implement technologies for improved treatment of municipal waste by 2016. | Reduction in the landfilling of biodegradable waste | $CH_4$ | Legislative | Implemented | 2016 | 5. | MECE | WM | NE | M-40 |
| M-54 | URBAN WASTEWATER MANAGEMENT | The 2020 Operational Programme for the Collection and Treatment of Urban Wastewater includes measures to increase the share of connections to sewer networks, where water is treated in wastewater treatment plants. | Reduction of emissions from urban wastewater management | $CH_4$ | Legislative | Implemented | 2020 | 5. | MECE | WM | NE | M-43 |

***Table 6: List of measures***

## II.D.10 Other information on policies and measures

The available estimates of expected GHG emission reductions presented in the table above are based on sectoral models used for the calculation of scenarios. The impact assessment was carried out by comparing the results of projections under different scenarios, in which various measures were progressively added. In some cases, the effects of measures were estimated by comparing scenarios including measures and those including additional measures. This approach ensured that double counting of the effects of individual measures was avoided. The impact of existing measures was not assessed, as a projection without measures was not prepared due to the complexity of defining such a scenario. The models used are described in Chapter II.F.
The achieved effects of measures are analysed in the context of climate policy implementation, as described in Chapter II.A.13. However, the impacts of individual measures are not assessed; instead, groups of measures are analysed based on trends in selected indicators and through additional analyses.

**Policies and measures no longer in effect**

There have been no changes since the previous report.

**Activities to reduce emissions from international transport**

Slovenia recognises the need to reduce GHG emissions in the maritime and aviation sectors and supports the European Union in its efforts to reduce emissions from international transport within the frameworks of the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO). With the support of Slovenia, the EU included aviation in EU ETS in 2012, which has contributed to reducing emissions below historical levels recorded between 2004 and 2006. The EU has also played a leading role in the adoption of ICAO's global market-based measure for reducing aviation emissions — the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which has been in force since 2021. Slovenia, alongside other EU Member States, has participated in this international agreement since the beginning of its initial pilot phase. The revised EU ETS Directive, effective from 1 January 2027, expands the scope of covered flights to include those originating from countries not participating in the CORSIA scheme, with the exception of small island developing states and least developed countries.

At the EU level, relevant activities are also being undertaken for maritime transport, including the monitoring and reporting of ship emissions. EU Member States have played an important role in the revision of the Initial IMO Strategy on the Reduction of GHG Emissions from Ships, adopted in 2018. The Revised Initial IMO Strategy (IMO Strategy 2023), adopted in 2023, sets out the ambition to achieve net-zero GHG emissions from international maritime transport around 2050. It also includes a target to reduce average $CO_2$ emissions per transport work in international shipping by at least 40% by 2030, compared to 2008 levels. Control points for 2030 and 2040 have been introduced, under which IMO Member States will strive to reduce total annual GHG emissions from international maritime transport by 30% by 2030 and by 80% by 2040, relative to 2008. IMO Strategy 2023 also foresees the uptake of zero- or near-zero GHG emission technologies, fuels, and energy sources, aiming for these to account for at least 5% — and with efforts towards 10% — of the energy used in international maritime transport by 2030. A basket of mid-term measures has also been adopted, comprising a technical element — in the form of a global fuel standard for GHG emissions — and an economic element based on a GHG pricing mechanism for the shipping sector. Formal adoption of the basket of mid-term measures is expected in spring 2026, while negotiations on the economic element remain ongoing within the IMO. From January 2024, EU ETS was extended to cover GHG emissions from all large ships (gross tonnage of 5,000 or more) calling at EU ports, regardless of their flag of registration. The system covers $CO_2$, $CH_4$ and $N_2O$ emissions, with $CH_4$ and $N_2O$ included from 2026 onwards. Emissions from maritime transport are included in

the overall ETS emissions cap, which decreases over time. This extension is expected to promote improved energy efficiency, support low-carbon solutions, and narrow the cost gap between alternative and conventional marine fuels.

**How policies and measures influence long-term GHG emission trends**

Slovenia is fully committed to achieving its national climate neutrality target[88] and the EU's overarching goal of climate neutrality. Consequently, policies and measures are designed to achieve their effects as promptly as possible, while also ensuring a sustained long-term reduction in GHG emissions.

As noted in Slovenia's previous report, the majority of its measures are designed with a long-term perspective, meaning their implementation extends beyond 2030. These measures are expected to continue supporting technologies for GHG reduction in alignment with both national and EU targets. A significant portion of Slovenia's measures focuses on stimulating investments, which will yield short-term emission reductions. Due to the long operational lifetimes of the technologies involved, these measures will also have a substantial long-term impact on GHG emission trends. Examples of such measures include the construction of hydropower plants, energy renovations of buildings, the development of district heating systems utilising renewable energy sources, and waste management systems. Additionally, a range of EU-level measures will contribute to long-term emission reductions, such as EU ETS and vehicle emission standards (see EU-BRT1). Measures related to research, technological development, innovation, education, training, and public awareness will have an even greater long-term effect on reducing GHG emissions than on achieving short-term reductions.

**Assessment of economic and social impacts**

The assessment of economic and social impacts of climate response measures is an integral part of the preparation of climate policies and measures. Slovenia's climate policy is closely aligned with EU climate policy, particularly in the formulation of national goals and measures derived from the EU legal framework. The EU has established a system for assessing the impacts of all new political initiatives, which is a mandatory component of decision-making procedures for new legislation and any policy proposals with far-reaching implications. See also EU BTR1. Slovenia has developed its own system and regularly evaluates the environmental, social, and economic impacts in the formulation of policies and measures, which includes public consultation. The system is detailed in SI BR5/NC8.A detailed description of the system is provided in Slovenia's BR5/NC8 report.

The most recent assessment of economic and social impacts was conducted during the revision of the NECP, and a formal environmental impact assessment procedure was carried out. The impacts on GDP, consumer welfare, employment, savings, public finances, and other factors were evaluated. Interested public stakeholders were engaged in the process. Projections indicate an improvement in consumer welfare across all quintile groups, although wealthier households are expected to benefit disproportionately, suggesting an increase in inequality. Positive effects are also anticipated in employment, with a projected 4.6% reduction in the unemployment rate following the implementation of NECP measures, compared to a scenario with existing measures. As part of the comprehensive environmental impact assessment, the NECP measures were also evaluated for their socio-economic effects, particularly concerning the environment and public health.

A key result of the evaluation of the social and economic impacts of climate policies is the development of new measures aimed at ensuring a just transition, particularly those to reduce energy poverty, support the just transition of coal regions (see measure M-16), and implement other just transition measures that are already incorporated into the revised NECP. The

[88] The Environmental Protection Act defines Slovenia's long-term objective of achieving climate neutrality by 2050.

activities supporting the just transition are further strengthened through the development of the *Social Climate Plan*, with a focus on providing support to the most vulnerable households in implementing energy efficiency measures and reducing GHG emissions from energy use for heating and transport.

## II.E. Summary of GHG emissions and removals

91. Each Party that submits a stand-alone national inventory report shall provide a summary of its GHG emissions and removals. This information shall be provided for those reporting years corresponding to the Party's most recent national inventory report, in a tabular format.

In 2022, $CO_2$ emissions accounted for 81.3% of total GHG emissions. $CO_2$ emissions, excluding those from LULUCF, followed energy consumption trends and significantly influenced overall emission trends due to their substantial share. Compared to 1986, $CO_2$ emissions were 24.2% lower in 2022. $CO_2$ is primarily generated from fuel combustion and industrial processes. $CH_4$ emissions, which predominantly originate from waste and agriculture, accounted for 12.2% of total emissions in 2022 and were 34.8% lower than in 1986. $N_2O$ emissions represented 4.5% of total emissions, marking a 3.2% decrease compared to 1986. Agriculture remains the main source of these emissions, with notable contributions also observed from road transport. Fluorinated gases (F-gases) constituted 2.0% of total emissions. Emissions of certain gases, such as HFCs and $SF_6$, were significantly higher than in 1995 (the baseline year for F-gas emissions), whereas PFC emissions decreased substantially.

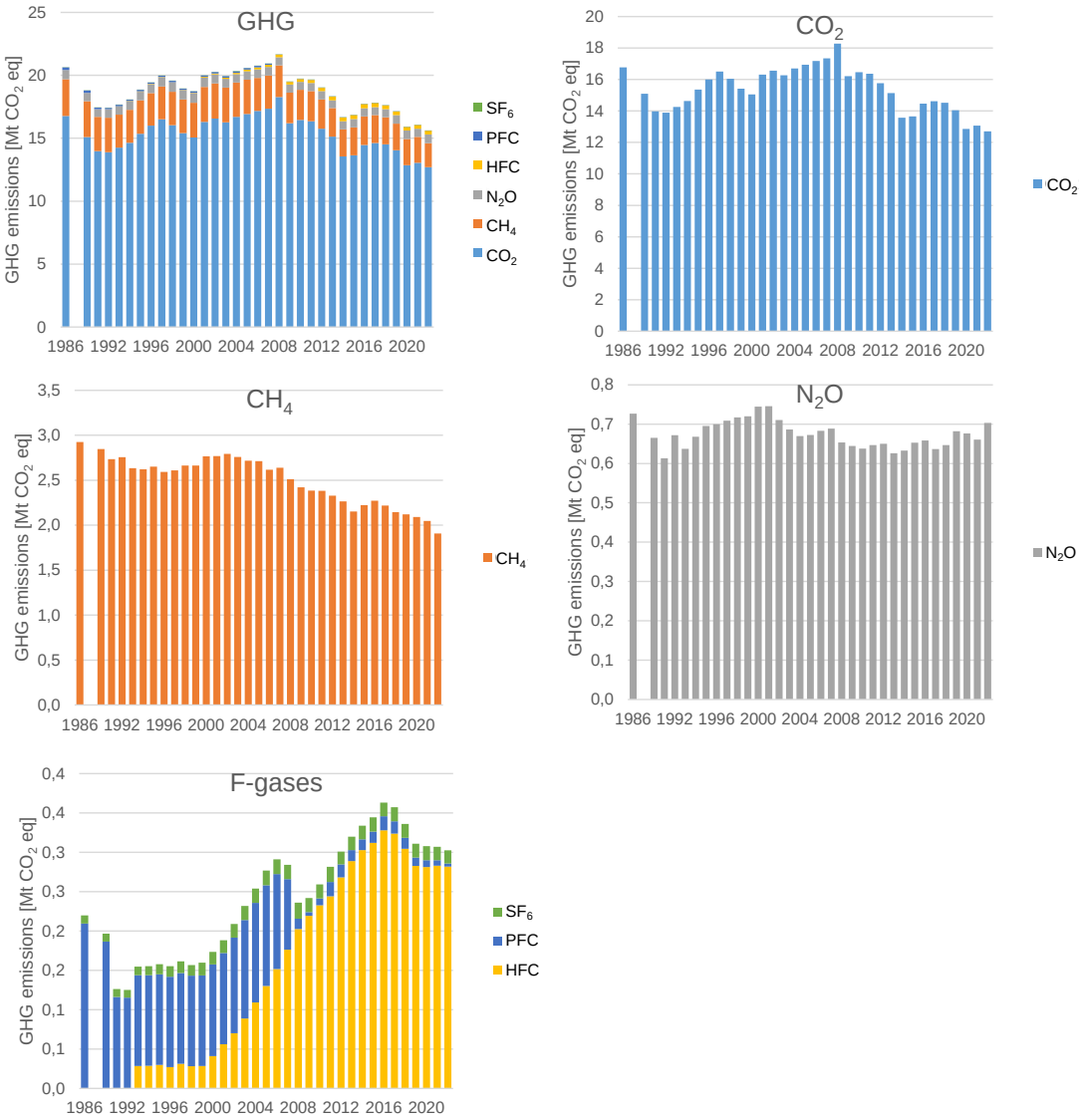


***Figure 14: GHG emissions by gas (Source: EARS)***

## Description and explanation of emission trends by source

In accordance with UNFCCC reporting guidelines, emission estimates are classified into five IPCC categories: energy, industrial processes and product use, agriculture, land use, land-use change and forestry (LULUCF), and waste.

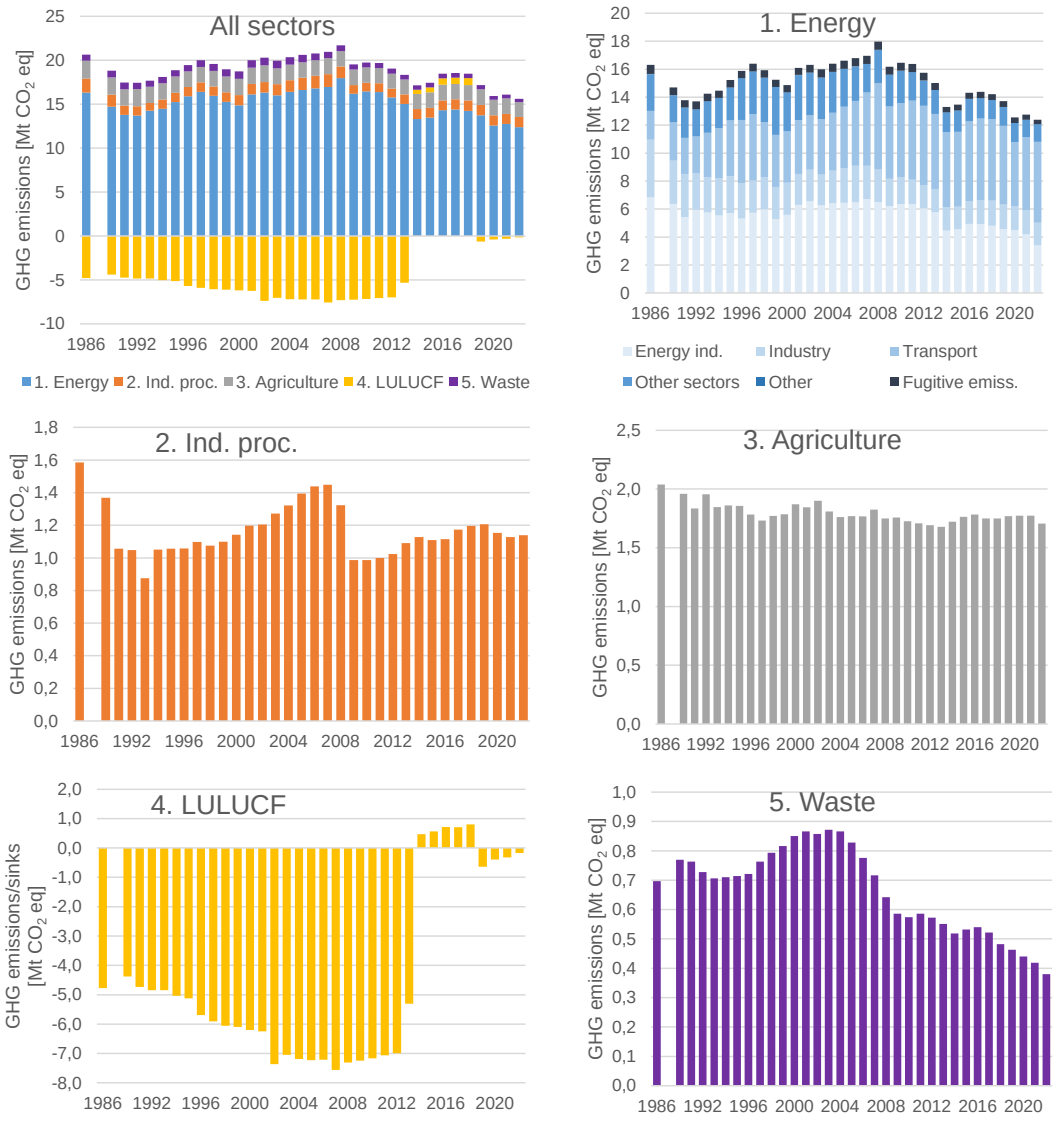


***Figure 15: Figure 14: GHG Emissions in Slovenia by sector (Source: EARS)***

The energy sector remains the dominant contributor, accounting for 79.3% of total GHG emissions in 2022. Compared to 1986, emissions from this sector decreased by 24.7%. Between 1986 and 2022, GHG emissions from energy transformation (CRF 1.A.1)—the largest subsector within energy in the base year—declined by 50.1%. However, during 1999–2007, emissions in this sector saw a sharp increase of 27%, primarily driven by higher electricity consumption.

The most significant increase in GHG emissions was observed in the transport sector, which recorded a 200% rise by 2008, mainly due to the expansion of road transport. In contrast, emissions from other transport modes slightly declined. In 2009, GHG emissions from transport decreased by 16.3% compared to 2008. Since then, annual emissions have fluctuated but have not reached the peak levels recorded in 2008. Due to COVID-19-related measures, transport emissions dropped by 18.7% in 2020 compared to the previous year but nearly returned to pre-pandemic levels by 2021. In 2022, emissions increased by 11.3% from 2021, standing 182.5% higher than in the base year.

GHG emissions from manufacturing and construction declined substantially between 1986 and 2001, recording a 50.3% decrease. After 2001, emissions stabilized but fell by 15.6% in 2009, reflecting the impact of the global financial crisis. In subsequent years, emissions declined further, and in 2015, they were 31.3% lower than in 2008, largely due to the

prolonged economic downturn. In the years following the economic recovery, emissions from manufacturing and construction increased until 2018, after which they stabilized. In 2022, emissions decreased by 7.3%. Throughout the 1986–2022 period, emissions from this sector decreased by 61.1%.

Emissions from other sources, mainly buildings, have varied over the years due to annual temperature fluctuations and changes in household biomass use, as Slovenian households can quickly switch from biomass to light fuel oil for heating. Despite short-term fluctuations, the observed period shows a strong overall decline in emissions, largely driven by the implementation of measures to reduce GHG emissions. In 2022, emissions were 51.7% lower than in 1986.

Fugitive emissions from fuels accounted for only 2.4% of emissions in the sector and decreased by 52.5% compared to 1986.

Since 1986, GHG emissions from industrial processes initially fell sharply, reaching their lowest level in 1993. However, emissions then began to rise again, peaking in 2007 at 6.0% above 1986 levels. Due to the global financial crisis and a decline in industrial production, emissions in 2009 were 28.2% lower than in 1986. Between 2009 and 2019, emissions gradually increased by 21.3%. In 2020, emissions declined by 4.3% due to COVID-19-related measures. In 2021 and 2022, emissions increased again. The primary GHG in this sector was carbon dioxide ($CO_2$), accounting for 64.9% of emissions, followed by HFCs at 24.7%, nitrous oxide ($N_2O$) at 8.5%, sulphur hexafluoride ($SF_6$) at 1.5%, and PFCs at 0.3%. Methane ($CH_4$) emissions from this sector have been absent since 2011. The main emission source was mineral product manufacturing, particularly cement and lime production, which alone accounted for 45.5% of emissions in this sector. Overall, this sector accounted for 50.4% of total emissions, followed by the consumption of fluorinated gases (used as substitutes for ozone-depleting substances) at 24.7%, the production and use of other products at 10.0%, and other sectors contributing the remaining emissions.

In agriculture, the second most significant sector, emissions in 2022 amounted to 1,706 kt $CO_2$ equivalent, representing 10.9% of total emissions. Agriculture is the primary source of methane ($CH_4$) and nitrous oxide ($N_2O$) emissions, accounting for 64.6% of total $CH_4$ emissions and 62.2% of total $N_2O$ emissions. Within agricultural emissions, $CH_4$ accounts for 72.2%, $N_2O$ for 25.6%, and $CO_2$ for 1.9%. Agricultural GHG emissions fluctuate slightly from year to year but have generally been declining. In 2022, emissions were 16.3% lower than in the base year. Emissions are decreasing across all key categories, with the most significant reduction observed in $CH_4$ emissions from manure management, due to a decline in the pig population and improved manure management practices on farms. Emissions from enteric fermentation have decreased due to the increased productivity of dairy cows, while emissions from agricultural soils have declined as a result of better nitrogen input management. The largest share of emissions in agriculture originates from enteric fermentation, which contributes 57.7% of total agricultural emissions. This is followed by emissions from agricultural soils (21.6%), while the remaining share comes from $CH_4$ and $N_2O$ emissions from manure management (18.7%) and $CO_2$ emissions from liming and urea application.

In 2022, total net removals in the LULUCF sector amounted to -173 kt $CO_2$ equivalent, which was significantly lower than in the base year. The highest net removals were recorded in 2007. Since then, net removals have continued to decline, initially due to changes in national forestry policy, following the adoption of the National Forest Programme. However, after 2014, Slovenia’s forests were severely affected by natural disasters. Between 2014 and 2018, salvage logging in damaged forests increased by approximately 50%, leading to LULUCF becoming a net source of GHG emissions. In recent years, forest conditions have shown slight improvement; however, in 2022, net removals remained 96.7% lower than in

2013.

Methane emissions from the waste sector are the second-largest source of $CH_4$ emissions in Slovenia, accounting for 18.4% of total methane emissions in 2022. Within this sector, $CH_4$ emissions represent 85.8%, while $N_2O$ accounts for 10.5% and $CO_2$ for 3.7%. Solid waste disposal contributed 46.4% to total emissions from the waste sector, followed by wastewater treatment (44.9%), composting (5.0%), and waste incineration (3.7%). In 2022, emissions were 45.5% lower than in 1986. Emissions from solid waste disposal began to decline in 2005 and, by 2022, had decreased by 67.7% due to a significant reduction in the volume of landfilled biodegradable waste and increased landfill gas capture. Wastewater emissions were 53.6% lower than in the base year, primarily due to improved gas capture at wastewater treatment plants and a decline in industrial production.

## II.F. Projections of GHG emissions and removals, as applicable

92. Each Party shall report projections pursuant to paragraphs 93–101 below; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report these projections.
93. Projections are indicative of the impact of mitigation policies and measures on future trends in GHG emissions and removals, and shall not be used to assess progress towards the implementation and achievement of a Party's NDC under Article 4 of the Paris Agreement unless the Party has identified a reported projection as its baseline as identified in chapter III.B above.
94. Each Party that reports pursuant to paragraph 92 above shall report a 'with measures' projection of all GHG emissions and removals and may report a 'with additional measures' projection and a 'without measures' projection. 1
95. Projections shall begin from the most recent year in the Party's national inventory report and extend at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement.
96. Each Party should provide information in describing the methodology used to develop the projections. This information should include: (a) Models and/or approaches used and key underlying assumptions and parameters used for projections (e.g. GDP growth rate/level, population growth rate/level); (b) Changes in the methodology since the Party's most recent biennial transparency report; (c) Assumptions on policies and measures included in the 'with measures' projections and 'with additional measures' projections, if included; (d) Sensitivity analysis for any of the projections, together with a brief explanation of the methodologies and parameters used.
97. Each Party shall also provide projections of key indicators to determine progress towards its NDC under Article 4 of the Paris Agreement.
98. Each Party shall include projections on a sectoral basis and by gas, as well as for the national total, using a common metric consistent with that in its national inventory report.
99. Projections shall be presented relative to actual inventory data for the preceding years.
100. Emission projections shall be provided with and without LULUCF.
101. Projections shall be presented in graphical and tabular formats.
102. Those developing country Parties that need flexibility in the light of their capacities with respect to paragraphs 93–101 above can instead report using a less detailed methodology or coverage.

The emission projections presented in this chapter are newly developed and were prepared in 2023 and 2024 as part of the revision of NECP. These projections are thoroughly documented in the Revised Final Report on Updated Technical Bases for NECP[89]. Projections have been developed up to 2050 in five-year intervals. For the purposes of this report, projections are presented up to 2040, compared with the latest available data. The base year for projections and model calibration is 2020. However, some models were additionally calibrated for 2019 and 2021. This additional calibration was necessary as the

[89] Dopolnjeno Končno poročilo o posodobljenih strokovnih podlagah NECP, IJS CEU et all, december 2024 (Revised Final Report on Updated Technical Bases for NECP, JS CEU et all, December 2024).

measures to prevent the spread of the SARS-CoV-2 virus had a significant impact on emissions in 2020, particularly in the transport sector. Data for 2021, and especially for 2022, indicate that the long-term impact of the pandemic on emissions in Slovenia is expected to be negligible Another major factor that adds complexity to emission projections and may have a more lasting impact is the war in Ukraine, along with sanctions against Russia and its retaliatory measures. This has influenced fossil fuel prices, particularly natural gas, but its long-term impact on emissions remains difficult to assess due to uncertainty about how the situation will evolve. Nevertheless, EU policy provides greater predictability, as the measures implemented to mitigate high energy prices through price reductions are time-limited.

During this period, a more ambitious climate and energy policy of the EU and Slovenia was also adopted, which is reflected in the new targets under Regulation 2023/857 for 2030. As a result, GHG emissions in the new projections are lower compared to previous projections.

## II.F.1 Definition of scenarios

The projections were calculated for a With Measures (WM) scenario and a With Additional Measures (WAM) scenario, with the latter further divided into four sub-variants: for the transport sector, two variants—Rapid Improvement of Supply (RIS), which analyses the impact of measures focused on improving the availability of sustainable transport modes, and Demand Management (DM), which further analyses the impact of measures aimed at managing car travel demand; and for the energy supply sector, two variants—Renewable Energy Sources (RES), where the majority of electricity demand is met by renewable energy sources, and Nuclear, which involves the construction of new nuclear units for electricity generation. This report presents the With Measures (WM) scenario and the With Additional Measures (WAM) scenario, which incorporates the DM scenario for transport and the RES scenario for energy supply. The With Measures (WM) scenario includes all measures that were implemented or adopted by mid-2021. The With Additional Measures (WAM) scenario, which aims to achieve the 2030 targets set under Regulation 2023/857, also targets net-zero emissions by 2050. In addition to existing measures, it assumes the intensive implementation of additional measures that significantly contribute to emission reductions.

| Sector | Projection with Measures | Projection with Additional Measures |
|---|---|---|
| Energy Supply – TRANSFORMATION | **Fossil Energy Sources**: Phase-out of coal-fired power plant operations by 2033, with new gas units ensuring strategic reserves.<br>**Renewable Energy Sources (RES)**: Construction of a new biomass CHP unit, while other RES (solar PV, wind, etc.) follow the current development trajectory.<br>**Nuclear Energy (NE)**: Operation of the existing unit until 2043, with no new unit planned.<br>**District Heating Systems**: Continuation of current development trends, with adjustments in the energy mix to meet the requirements of the Energy Act regarding the share of heat from RES and/or CHP. | **Fossil Energy Sources**: Same as the With Measures scenario.<br>**Renewable Energy Sources (RES)**: Development of large hydropower plants and pumped-storage hydropower plants, while other RES (solar PV, wind, etc.) follow an accelerated development trajectory.<br>**Nuclear Energy (NE)**: Operation of the existing unit until 2043, with no new unit planned.[90]<br>**District Heating Systems**: Accelerated development trajectory, with a rapid shift in the energy mix towards a higher share of RES (including waste heat) and/or CHP using synthetic gas.<br><br>The RES and Nuclear Energy (NE) scenarios do not differ until 2030. However, after 2030, the RES scenario |

[90] In the projections for NECP 2024 two scenarios were analysed: one without and one with a new nuclear power plant unit. This report presents the scenario without a new nuclear unit; however, this does not preclude a decision regarding the construction of a second nuclear reactor. The scenario has been selected for presentation because emissions are slightly higher.

| Sector | Projection with Measures | Projection with Additional Measures |
|---|---|---|
| | | assumes a faster expansion of renewable energy capacity, whereas the NE scenario anticipates a slower RES deployment, as new nuclear power generation units are planned for 2045 and 2050. |
| Energy Consumption – INDUSTRY | **Energy Efficiency (EE):** Continued improvement in energy efficiency of industrial processes, in line with historical trends.<br>**Fossil Fuels**: Transition to natural gas (NG), reduction in the use of light fuel oil (LFO) and liquefied petroleum gas (LPG), phase-out of coal by 2035.<br>**Combined Heat and Power (CHP)**: Existing installations remain in operation.<br>**Renewable Energy Sources (RES)**: Increased use in line with current development trends.<br>**Waste Heat**: Minimal utilisation.<br>**Material Efficiency:** Selected measures are introduced, exerting minimal impact on energy demand. | **Energy Efficiency (EE):** Intensified improvements in energy efficiency of processes, accelerating the replacement of inefficient technologies.<br>**Fossil Fuels**: Replacement of natural gas with electricity where feasible, as well as with RES and hydrogen; by 2050, natural gas is replaced by synthetic gas.<br>**Combined Heat and Power (CHP)**: Expansion of capacity.<br>**Renewable Energy Sources (RES)**: Significant increase in utilisation.<br>**Waste Heat:** Substantial increase in utilisation.<br>**Material Efficiency:** Measures are introduced to reduce energy demand for the production of new materials and products.<br>**CCU**: In cement production. |
| Energy Use – BUILDINGS | **Energy Efficiency (EE)**: Gradual reduction in renovation rates due to increasing complexity, with a higher share of comprehensive renovations.<br>**Fossil Fuels:** Transition to natural gas (NG), expansion of the network, and phase-out of other fossil fuels (LFO, LPG).<br>**District Heating (DH)**: Expansion of the existing network and construction of new systems where economically viable.<br>**Renewable Energy Sources (RES):** Deployment in areas without alternative options (where NG and DH networks are unavailable). | **Energy Efficiency (EE)**: Higher renovation rates compared to the With Measures (WM) scenario, with intensive removal of barriers. A high share of comprehensive renovations.<br>**Fossil Fuels:** Gradual phase-out of NG. By 2050, residual use (mainly for apartment heating and CHP) is replaced by synthetic gas. Ban on the purchase of LFO-based heating systems. Introduction of ETS 2.<br>**District Heating (DH)**: More intensive expansion of the existing network and construction of new systems.<br>**Renewable Energy Sources (RES):** Significant increase in deployment (particularly heat pumps and wood biomass). |
| Energy Use – TRANSPORT | **Infrastructure:** Completion of all major road network corridors, modernization of the railway network (TEN-T and selected regional connections), and improvements to existing cycling infrastructure.<br>**Modal shift:** Implementation of measures to increase the share of public passenger transport (PPT), although road passenger-kilometres continue to increase. The share of rail freight transport remains stable.<br>Implementation of the transport development strategy.<br>**Vehicle fleet:** Compliance with pre-2023 EU legislation on average $CO_2$ emissions for new vehicles, leading to a slow uptake of alternative propulsion systems.<br>**Biofuels:** Increase in biofuels to technically feasible levels (7% for diesel, 5% for petrol). Introduction of second-generation biofuels in line with the 2018 EU Renewable Energy Directive. | **Infrastructure:** Accelerated investment in railway infrastructure, including the construction of all planned connections (including regional links), alongside significant investment in cycling infrastructure.<br>**Modal shift:** Active measures to shift transport demand away from private vehicles, with the intensive implementation of policies aimed at increasing the share of PPT (halting the growth of car traffic). Cars remain the dominant mode of transport. The projected growth in road freight transport is lower than in the scenario with existing measures.<br>**Vehicle fleet:** Faster electrification of passenger cars and light commercial vehicles, with a higher share of alternative propulsion systems in heavy-duty vehicles and buses. Replacement of fossil liquid fuels with synthetic fuels.<br>**Biofuels and other $CO_2$-neutral fuels:** Increase in biofuels to 11% by 2030. Accelerated deployment of advanced biofuels. Introduction of RFNBO |

| Sector | Projection with Measures | Projection with Additional Measures |
|---|---|---|
| | | (renewable fuels of non-biological origin) in accordance with the 2023 Renewable Energy Directive.<br>**Introduction of ETS 2.**<br><br>The RIS and DM scenarios differ in modal structure, with RIS having a lower share of public passenger transport (JPP) and DM a higher one. |
| Industrial processes | Implementation of the Regulation on Fluorinated Gases (F-gases) and the Directive on F-gas Use in Mobile Air Conditioning Systems. | CCU in cement production. Further reduction of F-gas emissions compared to the With Measures scenario. |
| Agriculture | Implementation of actions under the Strategic Plan for the Common Agricultural Policy (CAP) 2023–2027, including measures to increase nitrogen use efficiency in crop production and improvements in livestock production efficiency. | Scaling up existing measures beyond 2027 under the new CAP Strategic Plan. |
| Waste | **Solid waste disposal:** Waste flow projections follow the 2016 Municipal Waste Management and Prevention Programme. No disposal of biodegradable waste.<br>**Waste water:** Expansion of sewer networks and replacement of septic tanks with biological treatment plants. | Same assumptions as in the With Measures scenario. |
| LULUCF | It is assumed that market participants in the timber sector do not change their practices, forested area remains stable over time, and land-use change trends continue in line with past years.<br>Mortality rate decreases from 5% to 4% by 2050. | Increased implementation of protective and silvicultural measures, including intensified adaptation of tree species composition, leading to a mortality rate of 3%.<br><br>Other assumptions remain consistent with the With Measures scenario. |

***Table 7: Overview of key assumptions in the With Measures and With Additional Measures scenarios***

## II.F.2 Definition of sectors in projections

The sectoral classification used in the projections aligns with Slovenia's strategic documents for GHG emission reduction (e.g., the NECP), which differs from the CRF classification. The alignment between the sectors used in the projections and the CRF classification is shown in the table below

| Projection Sector | CRF Category |
|---|---|
| Transformation and fugitive emissions (only transformation (sector) is also used) | 1.A.1 Transformation<br>1.B Fugitive emissions |
| Industry (and construction) | 1.A.2 Manufacturing Industries and industries |
| Transport | 1.A.3 Transport |
| Other energy use (also Other sectors) | 1.A.4 Other sectors<br>1.A.5 Other |
| Industrial processes | 2. Industrial processes |
| Agriculture | 3. Agriculture |
| Waste | 5. Waste |
| Sinks | 4. LULUCF |

***Table 8: Linking projection sectors with CRF categories***

## II.F.3 Projection results

### Total GHGes emissions

Under the With Measures (WM) scenario, GHG emissions in 2025 are projected to reach 16,479 kt $CO_2$-eq, representing a 5.5% increase compared to 2022 levels. In 2030, emissions under this scenario are expected to decline slightly to 16,325 kt $CO_2$-eq, marking a 0.9% reduction from 2025. A more substantial decrease follows by 2040, with emissions falling to 31% below 2030 levels. In the With Additional Measures (WAM) scenario, emissions in 2025 are estimated at 15,916 kt $CO_2$-eq, reflecting a 1.9% increase compared to 2022. By 2030, emissions are projected to decrease significantly to 13,376 kt $CO_2$-eq, a reduction of 16% from 2025 levels. The downward trend continues in 2040, with emissions falling by 56% compared to 2030.

Tables with detailed results of emission projections are provided below (Table 10 and Table 11).

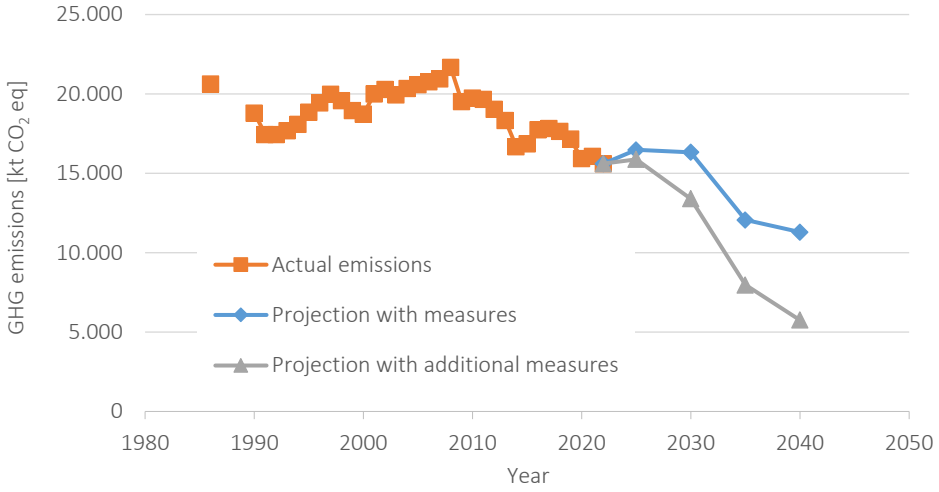


***Figure 16: Historical trajectory of emissions excluding removals until 2022, and projected emissions under the With Measures and With Additional Measures scenarios from 2025 to 2040. (Source: EARS, IJS-CEU, AIS)***

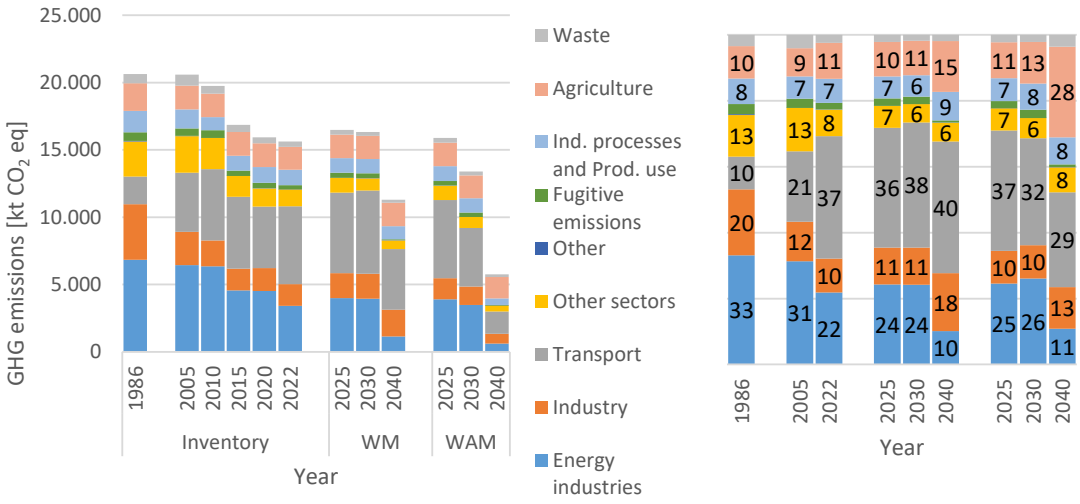


***Figure 17: Sectoral structure of GHG emissions in selected past years and under the With Measures and With Additional Measures scenarios for 2025, 2030, and 2040 – left: total emissions, right: sectoral emission shares in percentages. (Source: EARS, IJS-CEU, AIS)***

### Carbon dioxide

Under the With Measures (WM) scenario, $CO_2$ emissions in 2025 are projected to reach 13,633

kt $CO_2$, 7% higher than in 2022 but 7% lower than in 2017. By 2030, emissions are expected to increase by less than 1% compared to 2025, before decreasing by 34% between 2030 and 2040. In the With Additional Measures (WAM) scenario, emissions remain significantly lower throughout the 2025–2040 period compared to the With Measures scenario. In 2025, emissions are projected to be 3% higher than in 2022, but by 2030 they are expected to be 18% lower, with a further reduction of 65% by 2040.

$CO_2$ emissions account for the largest share of GHG emissions in Slovenia. Under the With Measures scenario, their proportion of total GHG emissions is projected to increase from 81% in 2022 to 84% in 2030, before decreasing to 80% by 2040. In the With Additional Measures scenario, the share declines gradually to 80% by 2030, followed by a more substantial reduction to 64% by 2040.

The transport sector remains the main source of $CO_2$ emissions, accounting for 40% of total $CO_2$ emissions in 2022. Under both scenarios, its share is projected to increase. Under the With Measures (WM) scenario, the share of transport emissions is projected to increase to 45% by 2030 and 49% by 2040. In the With Additional Measures (WAM) scenario, it remains at 40% in 2030 before rising to 44% by 2040. This increase is due to the slower reduction of emissions in the transport sector compared to other sectors, as implementation of mitigation measures in this sector faces the greatest delays. In 2022, the second-largest contributor was the transformation sector, accounting for 33% of emissions, followed by industry (11%), other energy use (9%), industrial processes (5%), and fugitive emissions (1%). The share of emissions from industry remains at a comparable level in both scenarios in 2030 (12–13%). In 2040, under the With Measures scenario, it rises to 22%, while in the With Additional Measures scenario, it increases to 19%. Emissions from industrial processes account for 6% of total emissions in 2030 under the With Measures scenario, rising to 10% by 2040. In the With Additional Measures scenario, the share reaches 8% in 2030 and 10% in 2040. A similar trend is observed in emissions from other energy use. Under the With Measures scenario, they represent 6% in both 2030 and 2040, while in the With Additional Measures scenario, the share increases to 7% in 2030 and 10% in 2040.

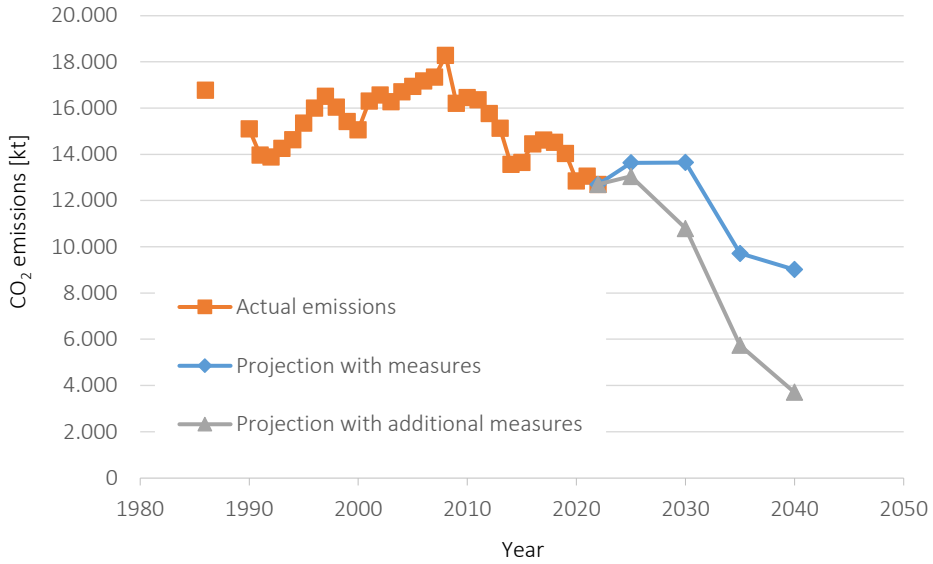


***Figure 18: Historical trajectory of $CO_2$ emissions (excluding removals) up to and including 2022 and projections until 2040(Source: EARS, IJS-CEU, AIS)***

### Methane

Methane emissions follow a similar downward trend in both the With Measures (WM) and With Additional Measures (WAM) scenarios. In 2030, emissions are projected to be 4% lower than

in 2022 under the With Measures scenario and 6% lower under the With Additional Measures scenario. In 2040, emissions are lower by 18% in the first scenario and 22% in the second. The waste sector is by far the largest contributor to emission reductions in both scenarios. In the With Additional Measures scenario, significant reductions also come from fugitive emissions, as coal is phased out more quickly, and from agriculture, which remains the largest source of methane emissions. In 2022, agriculture accounted for 58% of methane emissions. Although agricultural methane emissions decline slightly, their share of total methane emissions increases to 81% in the With Measures scenario and 82% in the With Additional Measures scenario in 2040. Wood combustion is also a significant source of methane emissions.

In 2022, methane accounted for 12% of total GHG emissions. Under the With Measures scenario, its share decreases to 11% in 2030 but rises to 14% in 2040. In the With Additional Measures scenario, methane's share increases further after 2030, reaching 13% in 2030 and 24% in 2040.

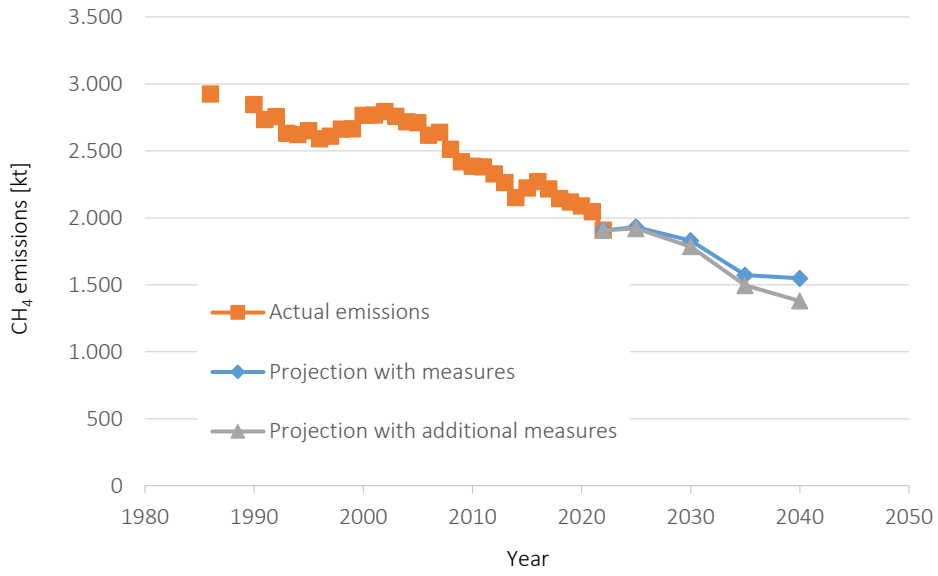


***Figure 19: Historical trajectory of $CH_4$ emissions (excluding removals) up to and including 2022 and projections under the With Measures and With Additional Measures scenarios in 2040 (Source: EARS, IJS-CEU, AIS)***

## Nitrous oxide

Nitrous oxide ($N_2O$) emissions are the only emissions that show only a slight decline. Emissions are projected to be 2% lower in 2030 and 3% lower in 2040 compared to 2022 under the With Measures scenario, and 5% lower in 2030 and 11% lower in 2040 under the With Additional Measures scenario. Agriculture is the main source of $N_2O$ emissions, accounting for approximately 70%. Its share falls to 65% in 2030 under the With Measures scenario and 67% under the With Additional Measures scenario, before rising again to 70% in both scenarios by 2040. Transport is the second-largest source, contributing 8% of emissions in 2022. This sector sees the steepest reduction, primarily due to the electrification of the vehicle fleet. Under the With Measures scenario, its share stands at 9% in 2030 and 7% in 2040. In the With Additional Measures scenario, it drops to 7% as early as 2030 and further to 4% by 2040. The waste sector accounted for 6% of $N_2O$ emissions in 2022, a share that remains unchanged in both scenarios. In both scenarios, the share of other energy use decreases from 7% in 2022 to 5% in 2030 and 4% in 2040. The share of the industry sector increases from 2% to 3% in 2040 under the With Measures scenario and to 4% under the With Additional Measures scenario.

$N_2O$ accounted for 5% of total GHG emissions in 2022. Under the With Measures scenario, its

share decreases to 4% by 2030 before rising to 6% by 2040. In the With Additional Measures scenario, the share remains at 5% by 2030 before increasing to 11% by 2040.

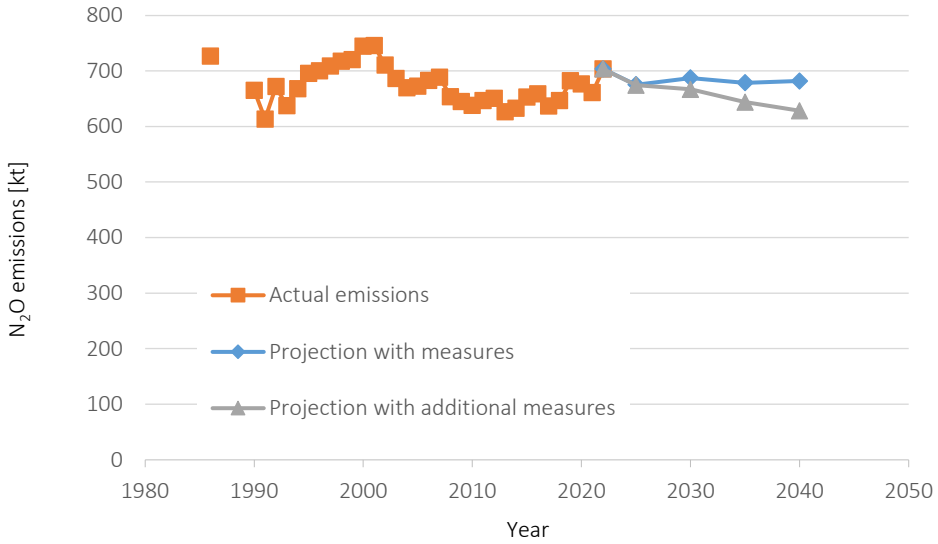


***Figure 20: Historical trajectory of $N_2O$ emissions (excluding removals) up to and including 2022 and projections under the With Measures and With Additional Measures scenarios in 2040 (Source: EARS, IJS-CEU, KIS)***

## F-gases

F-gas emissions decline significantly by 2040 in both scenarios. The With Measures and With Additional Measures projections are identical up to 2040, as all the measures considered have already been adopted. These include measures under the EU regulation on products and equipment containing F-gases and the directive regulating vehicle air conditioning systems. In 2030, F-gas emissions total 158 kt $CO_2$-eq, 48% lower than in 2022. By 2040, emissions fall by 70%.

The largest share of emissions comes from HFCs, which accounted for 93% of F-gas emissions in 2022. Their share declines to 90% by 2030 and 75% by 2040. PFCs made up 1% of F-gas emissions in 2022, but following the shutdown of primary aluminium production in 2023, these emissions are eliminated. $SF_6$ accounted for 6% of F-gas emissions in 2022. Its share increases to 10% by 2030 and 25% by 2040, as it is the only F-gas with rising emissions.

In 2022, F-gases made up 2% of total GHG emissions. Their share falls to 1% by 2030 in both scenarios and further to 0.4% in the With Measures scenario and 0.8% in the With Additional Measures scenario by 2040.

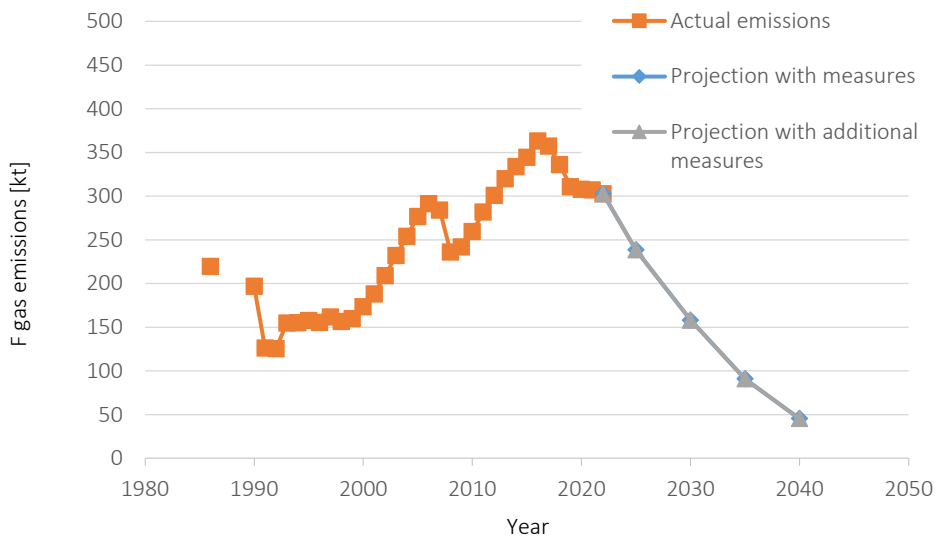


***Figure 21: Historical trajectory of F-gas emissions up to and including 2022 and projections up to 2040 (Source: EARS, IJS-CEU)***

## II.F.4 Emissions by sector

### Transformation and fugitive emissions

Transformation emissions (1.A.1) primarily cover emissions from electricity and heat production, with coal-fired power plants being by far the largest source. Gas-fired units and district heating systems also contribute to overall emissions. Future emission trends are shaped mainly by the declining electricity generation from coal-fired units and their replacement with gas-fired units, including some smaller CHP plants. In these units, low-carbon sources (LCS)—such as synthetic gas, hydrogen, and renewable energy sources (RES)—gradually replace natural gas. The share of renewables in district heating systems is also increasing. For synthetic gas and combustible renewable energy sources, it is assumed that they are $CO_2$-neutral.

Fugitive emissions (1.B) cover emissions released during the distribution of gas and liquid fuels, coal extraction, and flue gas desulphurisation. As coal demand decreases, fugitive emissions from coal extraction and desulphurisation also decline.

Since 2014, emissions have not risen above 5,400 kt $CO_2$-eq, a result of the closure of several coal-fired units and the construction of a more efficient coal unit. Coal for electricity generation is phased out by 2033 in both scenarios. The transition to alternative energy sources, along with additional electricity demand, is mainly covered by new gas-fired units, in addition to renewable energy sources (RES) and other low-carbon sources (LCS). As a result, emissions from transformation and fugitive emissions in the With Measures scenario are 15% higher in 2030 than in 2022, as the coal-fired power plant is still in operation. By 2040, emissions decrease by 67%. A greater reduction is achieved in the With Additional Measures scenario, as coal is phased out slightly earlier, and additional electricity demand is largely covered by renewable energy sources, particularly solar power plants. Since not all energy demand can be met by RES, especially in winter, additional gas-fired units are required. However, these units gradually replace natural gas with synthetic gas, or the new nuclear power plant provides additional capacity. This further impacts GHG emissions, so that by 2030, emissions are still 3% higher than in 2022 even under the With Additional Measures scenario, but by 2040, they decrease by 82% compared to 2022. Electricity generation increases in both scenarios compared to current levels. In the With Measures scenario, the increase is 2%, while in the

With Additional Measures scenario, electricity generation rises by 57%[91] compared to 2022.

Most of the emissions from this sector fall under EU ETS. In 2022, the share amounted to 88%. In 2030, the share increases to 89% in both scenarios, while in 2040, it decreases to 85% in the With Measures scenario and 82% in the With Additional Measures scenario.

In 2022, this sector accounted for 22% of total emissions. By 2030, its share increases to 24% in the With Measures scenario and 26% in the With Additional Measures scenario. By 2040, its share significantly declines, reaching 10% in the With Measures scenario and 11% in the With Additional Measures scenario.

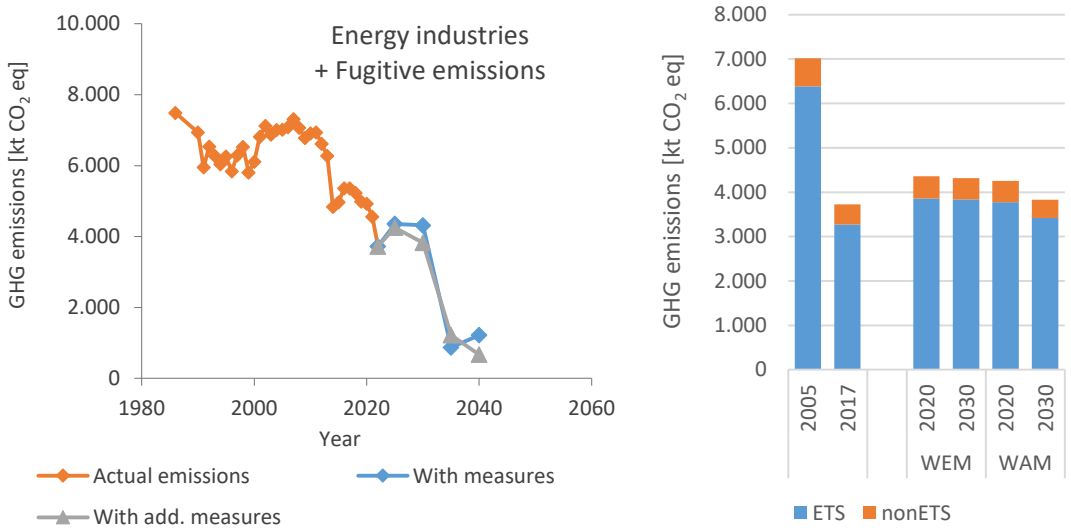


***Figure 22: GHG emissions from the transformation and fugitive emissions sector – historical trajectory up to and including 2022 and projections under the With Measures and With Additional Measures scenarios until 2040 (left), and distribution of emissions between EU ETS and non-ETS (right) (Source: EARS and IJS-CEU)***

## Industry and Construction

Emissions from fuel combustion in industry and construction (1.A.2) are projected to increase by 2040 under the With Measures scenario. However, they will remain below 2010 levels, despite a significant increase in added value. The growth in emissions will be controlled (i.e., the increase will be lower) through energy efficiency measures, which ensure that energy consumption grows at a significantly lower rate than added value. In addition, changes in the fuel mix, including a higher share of renewable energy sources (RES) and other climate-neutral fuels (such as hydrogen and synthetic gas), will contribute to this trend. Under the With Measures scenario, energy consumption in 2040 is 30% higher than in 2022. Under the With Measures scenario, emissions are projected to be 16% higher in 2030 and 24% higher in 2040 compared to 2022. In the With Additional Measures scenario, more intensive implementation of measures is assumed, leading to minimal growth in energy consumption, which is only 16% higher in 2040 compared to 2022. Moreover, the share of RES, electricity, and low-carbon gases is significantly higher than in the With Measures scenario, resulting in a more pronounced reduction in emissions. In 2030, emissions are 17% lower, while in 2040 they are 54% lower compared to 2022.

[91] The increase in electricity generation applies to the WAM-RES scenario, while in the WAM-NE scenario, the increase exceeds 100%.

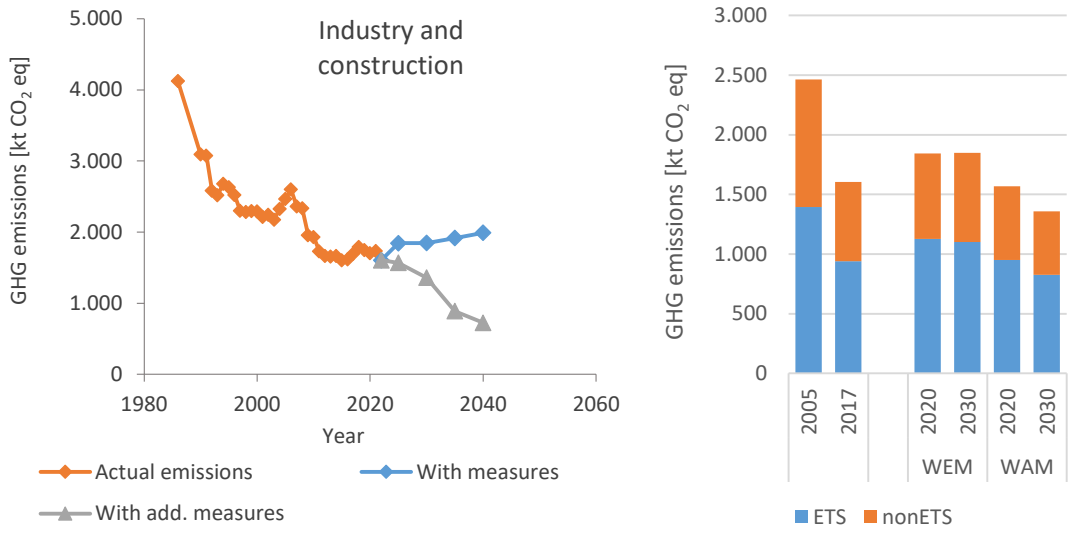


***Figure 23: GHG emissions from fuel combustion in industry and construction – historical trajectory from 1986 to 2022 and projections under the With Measures and With Additional Measures scenarios until 2040 (left), and distribution of emissions between EU ETS and non-ETS (right) (Source: EARS and IJS-CEU)***

As in the transformation sector, EU ETS emissions dominate in industry, though to a lesser extent. In 2005, EU ETS emissions accounted for 57%, increasing to 59% in 2022. Under the With Measures scenario, this share remains the same in 2040. In the With Additional Measures scenario, the share increases to 63% by 2030 before declining to 47% by 2040.
In 2022, fuel combustion in industry and construction accounted for 10% of total emissions. In 2030, this share remains at 11% under the With Measures scenario and at 10% under the With Additional Measures scenario. By 2040, the share increases to 18% under the With Measures scenario and to 13% under the With Additional Measures scenario.

**Transport**

Transport has been the largest source of emissions in Slovenia since 2014, when it surpassed the long-standing dominance of emissions from the transformation sector. It is also the sector that has recorded annual emission growth rates exceeding 10% in the past. In the future, growth is expected to slow or emissions to decline significantly. However, projections for this sector remain highly uncertain, particularly due to the impact of fuel purchases by foreign vehicles.

By 2040, traffic volumes on Slovenian roads are expected to continue increasing. Under the With Measures scenario, domestic passenger transport increases by 26% between 2019 and 2040, while domestic freight transport grows by 74%. In the With Additional Measures scenario, passenger transport increases by 5%, while freight transport rises by 63%. In addition to domestic vehicles, Slovenia is highly exposed to foreign traffic. Growth rates for passenger transport by foreign vehicles are lower than those for domestic vehicles, whereas freight transport growth rates—77% and 71%—slightly exceed those of domestic freight transport. The expansion of rail infrastructure will increase rail freight transport, but this will only be sufficient to maintain its share. Encouraging public passenger transport, combined with rail infrastructure development—particularly in the With Additional Measures scenario—increases the share of rail transport in passenger mobility to 5% in the With Additional Measures scenario, while bus transport rises to 15% by 2040. Energy consumption increases at a much lower rate than transport activity—or even decreases—due to significant improvements in vehicle efficiency, shifts in fleet composition toward electrification, and, to some extent, changes in behaviour and transport modes. Under the With Measures scenario,

energy consumption in 2040 is projected to be 4% lower than in 2022, while in the With Additional Measures scenario, it is projected to be 43% lower than in 2022. The reduction in emissions is also supported by the use of biofuels, whose share amounted to 5.0% in 2019. In the With Measures scenario, the biofuel share is expected to increase to 5.5% by 2030 and 6.5% by 2040, while in the With Additional Measures scenario, it is projected to reach 11% by 2030.

The implementation of the above measures keeps transport emissions in the With Measures scenario in 2030 slightly above the highest historical emissions recorded in 2008. In 2008, emissions were 6,159 kt $CO_2$-eq. Under the with measures (WM) scenario, emissions are projected to peak in 2030 at 6,191 kt $CO_2$-eq, representing a 7% increase compared to 2022. By 2040, emissions are expected to decline to 4,507 kt $CO_2$-eq, which is 27% lower than in 2022. In the With Additional Measures scenario, emissions are projected to decline rapidly from 2025 onwards, reaching 25% below 2022 levels by 2030 and 71% below 2022 levels by 2040. All transport emissions are included in the non-ETS sector. Starting in 2027, transport will be included in ETS 2 (ETS BRT), which will be separate from ETS 1 but will operate under a similar principle. However, in ETS 2, emission allowances will be purchased by fuel suppliers, who supply fuel to end-users. The cost of allowances or permits will be reflected in the price of fossil fuels.

In 2022, the transport sector accounted for 37% of total emissions. According to projections, transport will account for 38% of total emissions in the With Measures scenario and 33% in the With Additional Measures scenario in 2030. By 2040, this share is expected to increase to 40% in the With Measures scenario, while in the With Additional Measures scenario, it will decrease to 29%.

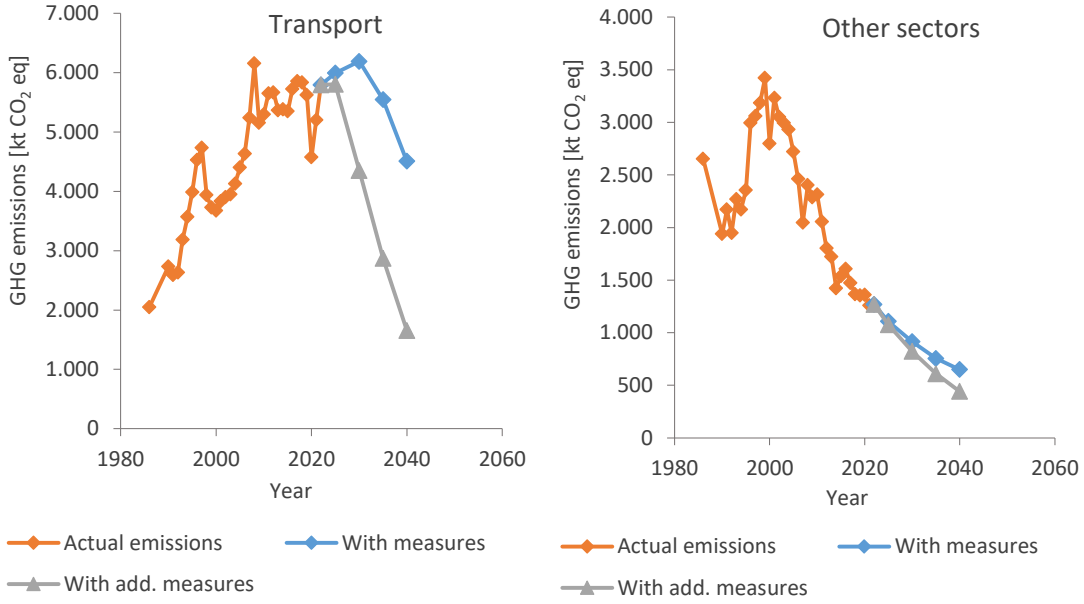


***Figure 24: GHG emissions from transport (left) and the Other energy use sector (right) from 1986 to 2022, along with projections under the With Measures (WM) and With Additional Measures (WAM) scenarios up to 2040 (Source: EARS and IJS-CEU)***

**Other energy use**

GHG emissions in the Other energy use sector, which includes energy consumption in households, services, and agriculture, are projected to decline significantly. The projections specifically assume the ambitious implementation of measures in these sectors, including a high rate of energy-efficient renovations for both residential and non-residential buildings, transforming them into highly energy-efficient structures. Measures also include the phasing out

of light fuel oil (LFO) boilers and a reduction in natural gas consumption, driven primarily by the transition to heat pumps. In sparsely populated areas, heating systems are expected to shift towards wood biomass boilers, while district heating connections will also be expanded. In the With Additional Measures scenario, the remaining natural gas consumption is replaced by synthetic gas. This transition will also be supported by the introduction of ETS 2 in 2027, in addition to national activities. Despite an increase in residential floor area by 10% between 2022 and 2040 and a more than 40% increase in non-residential building space over the same period, emissions are projected to decline. In the agriculture sector, diesel fuel is gradually replaced by synthetic liquid fuels, which are $CO_2$-neutral, and by biofuels.

According to records, emissions in 2022 were 14% lower than in 2017. By 2030, emissions are projected to decrease to 914 kt $CO_2$-eq in the With Measures scenario, representing a 28% reduction compared to 2022, while in the With Additional Measures scenario, they are expected to fall to 823 kt $CO_2$-eq, a 35% reduction. By 2040, emissions are expected to decline further, reaching 49% below 2022 levels in the With Measures scenario and 65% below 2022 levels in the With Additional Measures scenario.

In 2022, the Other energy use sector accounted for 8% of total emissions. By 2030, its share is projected to decrease to 6% in both scenarios. By 2040, this share remains at 6% in the With Measures scenario, while in the With Additional Measures scenario, it returns to 8%.

**Industrial process**

Following a decline in 2008, driven by the economic crisis and the closure of certain facilities due to non-compliance with environmental permit requirements, emissions increased until 2019 and remained relatively stable between 2020 and 2022. In 2022, total emissions amounted to 1,138.91 kt $CO_2$-eq. Projections indicate a decline in emissions, with a notable divergence between the two scenarios emerging in 2040. This difference is attributed to the installation of CCU and the introduction of lower-emission cement production in the With Additional Measures scenario, whereas these measures are not included in the With Measures scenario. Cement production remains the largest source of emissions in this sector, with emissions expected to increase in both scenarios until 2035. By 2040, emissions in the With Measures scenario continue to rise, whereas in the With Additional Measures scenario, they decrease significantly due to the deployment of CCU technology. The second-largest source of emissions in 2022 was F-gases, which are projected to decline rapidly in both scenarios as currently used substances are replaced with alternatives that have a significantly lower global warming potential. Metal production, the third-largest source of emissions, is projected to remain at similar levels to those observed in 2022. By 2030, total emissions are projected to reach 1,052 kt $CO_2$-eq in the With Measures scenario and 1,059 kt $CO_2$-eq in the With Additional Measures scenario, representing a reduction of over 7% compared to 2022. In 2040, emissions are expected to be 15% lower than in 2022 in the With Measures scenario, while in the With Additional Measures scenario, they are projected to decline by 58%.

A significant share of emissions from industrial processes falls under the EU ETS. In 2022, 57% of emissions were covered by the system, with this share projected to increase to 65% by 2030 in both scenarios. By 2040, the share is expected to rise to 72% in the With Measures scenario, while in the With Additional Measures scenario, it declines to 43%.

In 2022, the industrial processes sector accounted for 7% of total emissions. This share remains relatively stable, declining to 6% by 2030 in the With Measures scenario, before increasing to 9% by 2040. In the With Additional Measures scenario, the sector's share is projected to increase to 8% by 2030 and remains unchanged in 2040.

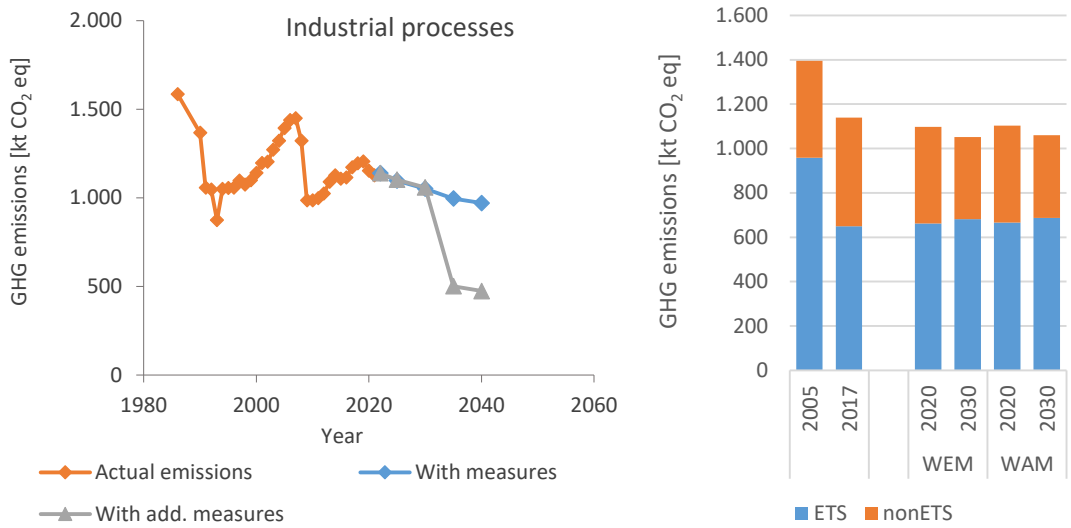


***Figure 25: GHG emissions from industrial processes, showing trends from 1986 to 2022, along with projections under the With Measures, With Additional Measures, and Without Measures scenarios until 2040 (left), and the distribution of emissions between the EU ETS and non-ETS sectors (right) (Source: EARS and IJS-CEU)***

## Agriculture

Agricultural emissions remain relatively stable over time, with 2022 emissions 2% lower than in 2017. No significant reductions are expected in the projections. In the With Measures scenario, emissions increase, whereas in the With Additional Measures scenario, they decline.

The average annual growth rate of emissions in the With Measures scenario is projected to be 0.1% between 2022 and 2030, increasing to 0.2% in the following decade. By 2030, emissions are projected to be 0.8% higher than in 2022, and by 2040, they are expected to be 2.6% higher. Additional measures contribute to reducing agricultural emissions. By 2030, emissions in the With Additional Measures scenario are projected to be 0.5% lower than in 2022, and by 2040, they are expected to be 7.2% lower than in 2022. In 2022, the agriculture sector accounted for 11% of total emissions. In the With Measures scenario, this share remains unchanged in 2030 but increases to 15% by 2040. In the With Additional Measures scenario, the share increases to 13% by 2030 and 27% by 2040.

The With Measures projections assume that the physical production volume of meat, milk, and eggs remains at levels observed in recent years, with one exception—pig farming, where production has declined significantly since 2007. Projections indicate that by 2030, weight gain in pig farming will recover to approximately 50% of the pre-decline levels, reaching 60% by 2040. By 2050, crop yields are projected to increase by approximately 40% compared to the 2013–2017 average. The nitrogen content in agricultural crops (including grassland) is expected to increase by around 8% by 2030.

In livestock farming, projections assume an increase in efficiency, allowing for similar milk and meat production with fewer animals and lower GHG emissions, thereby reducing emission intensity (fewer emissions per unit of milk or meat produced). The scenario with current measures projects that, by 2030, compared to the 2019–2021 average, the number of dairy cows will decrease by 3.2%, while the number of other cattle will decline by 4.8%. The projections also account for the effects of measures aimed at directly reducing methane emissions and nitrogen losses from livestock manure storage. These include measures such as the use of feed additives to reduce methane emissions from dairy cow digestion, the treatment of livestock manure in micro-biogas plants, the promotion of pasture-based livestock farming, and the covering of livestock manure storage facilities.

As part of measures to reduce emissions from livestock housing by promoting low-emission farming systems, an increase in the treatment of livestock manure in biogas plants is foreseen, along with a greater shift towards pasture-based cattle farming at the expense of intensive housing systems. Measures to improve nitrogen fertiliser use efficiency include increased incorporation of urea into the soil, more immediate ploughing-in of farmyard manure, and a higher share of low-emission fertilisation techniques when applying slurry. Model calculations indicate that, despite a significant increase in nitrogen content in agricultural products, the consumption of mineral fertilisers is expected to decline as a result of nitrogen use efficiency measures.

**Waste**

Emissions from waste and wastewater have been declining rapidly since 2004, reaching 380 kt $CO_2$-eq in 2022. The With Measures and With Additional Measures scenarios are identical. By 2030, emissions are projected to be 285 kt $CO_2$-eq, representing a 25% reduction compared to 2022. By 2040, emissions are expected to be 46% lower than in 2022.

In 2022, the waste sector accounted for 2% of total emissions. This share is projected to remain at 2% in 2030 and, under the With Measures scenario, remain unchanged in 2040. In the With Additional Measures scenario, the share is projected to increase to 4% by 2040.

The historical reduction in emissions is primarily due to the decrease in landfilled biodegradable waste, a trend expected to continue in the future. The reduction in biodegradable waste disposal results from lower waste generation, separate collection of waste and packaging, sorting and treatment at collection centres, and mechanical-biological waste treatment. In accordance with legislation, the landfilling of biodegradable waste has been prohibited since 2016. Emissions from wastewater treatment have also declined significantly due to expansion of the sewer network, upgrades to treatment plants, and the replacement of septic tanks with small biological treatment plants.

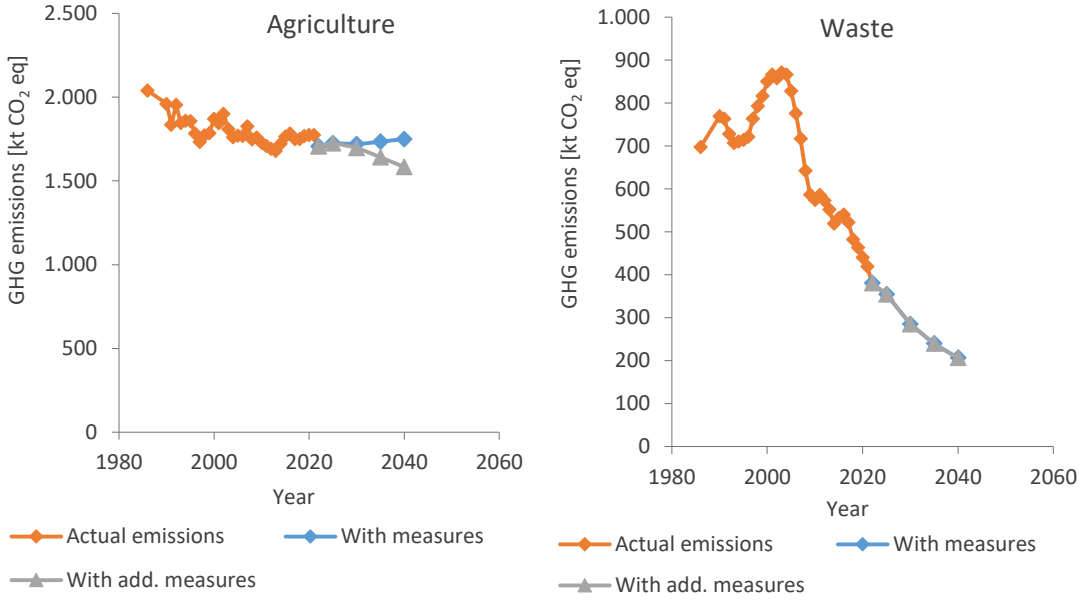


***Figure 26: GHG emissions from agriculture (left) and waste (right) from 1986 to 2022, along with projections under the With Measures and With Additional Measures scenarios until 2040 (Source: EARS, AIS, IJS-CEU)***

**International bunkers**

Fuels used in international maritime and aviation transport are not included in the projections

presented above, in accordance with reporting guidelines. In 2020, emissions from fuels sold for international bunkers accounted for 2.6% of Republic of Slovenia's total emissions, with 0.2% (26 kt $CO_2$-eq) from international aviation and 2.4% (382 kt $CO_2$-eq) from international maritime transport. By 2022, emissions from international aviation increased significantly, as 2020 had been an exceptional year due to measures aimed at preventing the spread of SARS-CoV-2. However, in 2022, there were no emissions from international maritime transport, as no fuel was sold in Slovenia for use by international vessels.

Projections indicate a long-term increase in emissions from international aviation. In the With Measures scenario, emissions are projected to be 29% higher by 2030 compared to 2022 and 67% higher by 2040. In the With Additional Measures scenario, emissions are expected to be 21% higher by 2030 and 3% higher by 2040. The lower emissions in the With Additional Measures scenario result from the introduction of alternative fuels in aviation.

No projections were made for international maritime transport, as no fuel sales for this sector were recorded in Slovenia in 2022.

Projections for aviation emissions were based on GDP growth, as historical data has shown a strong correlation between these two variables.

| | | | ***With Measures*** | | | ***With Additional Measures*** | | |
|---|---|---|---|---|---|---|---|---|
| | | ***2022*** | ***2025*** | ***2030*** | ***2040*** | ***2025*** | ***2030*** | ***2040*** |
| International Aviation – With Measures | [kt $CO_2$ eq] | 62 | 67 | 79 | 103 | 65 | 74 | 63 |
| International Maritime Transport | [kt $CO_2$ eq] | NO | NO | NO | NO | - | - | - |

***Table 9: Projections of emissions from fuel sales to international aviation and international maritime transport (Source: IJS-CEU)***

## Projection of $CO_2$ removals

$CO_2$ removals in Slovenia play a significant role in reducing emissions and mitigating climate change. In 2022, $CO_2$ removals amounted to -172 kt $CO_2$, representing 1% of Slovenia's total GHG emissions. After the 2014–2018 period, the LULUCF sector became a source of emissions due to natural disasters and salvage logging. However, since 2019, it has returned to being a net sink, though at significantly lower levels than before 2014.

According to the With Measures scenario, removals are projected to increase again after an initial decline, reaching -792 kt $CO_2$-eq by 2030. After 2040, removals are expected to decrease to -154 kt $CO_2$-eq, primarily due to increased harvesting needs, including those related to the unfavourable age structure of forests. In the With Additional Measures scenario, removals are projected to reach -2,089 kt $CO_2$-eq by 2030 and -2,187.38 kt $CO_2$-eq by 2040.
The main factor influencing $CO_2$ removals is the assumed volume of total harvesting, which includes thinning, final felling (for regeneration), and salvage logging. It is assumed that the harvest volume will amount to 75% of the annual forest growth. The two scenarios differ in their assumptions regarding mortality rates. The With Additional Measures scenario assumes a greater implementation of protective and silvicultural measures in forests, including more intensive adaptation of tree species composition. $CO_2$ storage in harvested wood products (HWPs) also has a significant impact on removals, with stronger effects in the With Additional

Measures scenario than in the With Measures scenario. The projections include all categories within the LULUCF sector.

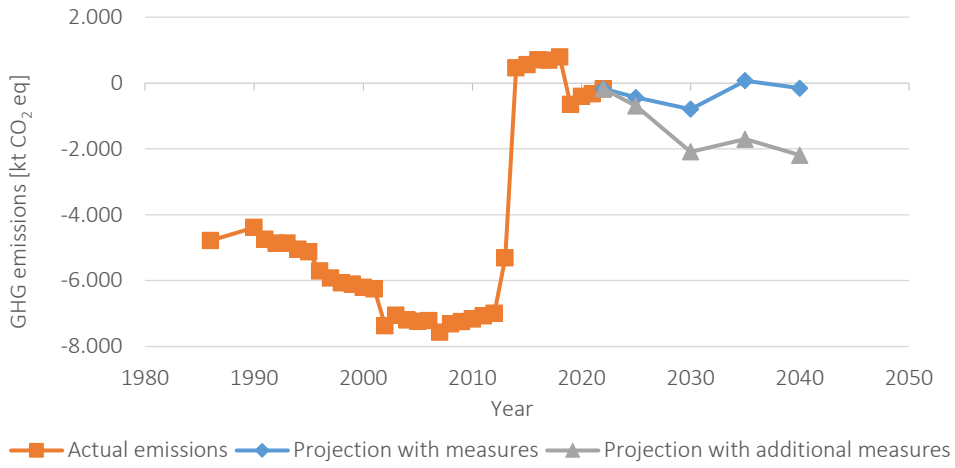


***Figure 27: Historical $CO_2$ removals until 2020 and projected removals under the With Measures and With Additional Measures scenarios until 2040 (Source: EARS, FIS)***

| | | Inventory | | | Projections under the With Measures scenario | | | |
|---|---|---|---|---|---|---|---|---|
| | | [kt $CO_2$ eq] | | | [kt $CO_2$ eq] | | | |
| CRF Code | Sector | 1986 | 2005 | 2022 | 2025 | 2030 | 2035 | 2040 |
| 1.A.1 1.B | Energy supply | 7,489 | 7,019 | 3,724 | 4,359 | 4,317 | 872 | 1,220 |
| 1.A.3 | Transport | 2,051 | 4,401 | 5,794 | 5,993 | 6,191 | 5,545 | 4,507 |
| | Industry | 5,710 | 3,859 | 2,744 | 2,941 | 2,899 | 2,913 | 2,962 |
| 1.A.2 | Energy Use of Fuels | 4,124 | 2,464 | 1,605 | 1,843 | 1,847 | 1,916 | 1,990 |
| 2. | Ind. Processes | 1,586 | 1,395 | 1,139 | 1,097 | 1,052 | 997 | 971 |
| 1.A.4 1.A.5 | Other Sectors | 2,653 | 2,720 | 1,266 | 1,106 | 914 | 754 | 649 |
| 3. | Agriculture | 2,038 | 1,769 | 1,706 | 1,726 | 1,719 | 1,735 | 1,750 |
| 4. | LULUCF | -4,782 | -7,236 | -173 | -435 | -792 | 72 | -154 |
| 5. | Waste | 697 | 828 | 380 | 354 | 285 | 240 | 206 |
| | | | | | | | | |
| | $CO_2$ with LULUCF | 11,921 | 9,644 | 12,480 | 13,173 | 12,835 | 9,769 | 8,848 |
| | $CO_2$ without LULUCF | 16,767 | 16,936 | 12,701 | 13,633 | 13,650 | 9,716 | 9,018 |
| | $CH_4$ with LULUCF | 2,926 | 2,711 | 1,917 | 1,933 | 1,832 | 1,574 | 1,550 |
| | $CH_4$ without LULUCF | 2,925 | 2,711 | 1,908 | 1,932 | 1,830 | 1,572 | 1,548 |
| | $N_2O$ with LULUCF | 790 | 728 | 743 | 700 | 708 | 696 | 696 |
| | $N_2O$ without LULUCF | 727 | 672 | 703 | 675 | 687 | 679 | 682 |
| | HFCs | 0 | 130 | 282 | 222 | 142 | 77 | 34 |
| | PFCs | 210 | 128 | 4 | 0 | 0 | 0 | 0 |
| | SF6 | 10 | 19 | 17 | 16 | 16 | 14 | 11 |
| | NF3 | | | | | | | |
| | TOTAL with LULUCF | 15,857 | 13,360 | 15,442 | 16,044 | 15,533 | 12,130 | 11,140 |
| | TOTAL without LULUCF | 20,638 | 20,596 | 15,615 | 16,479 | 16,325 | 12,058 | 11,293 |

***Table 10: Projections of GHG emissions and removals under the With Measures scenario***

| | | Inventory | | | Projections under the With Additional Measures scenario | | | |
|---|---|---|---|---|---|---|---|---|
| | | [kt CO2 eq] | | | [kt CO2 eq] | | | |
| CRF Code | Sector | 1986 | 2005 | 2022 | 2025 | 2030 | 2035 | 2040 |
| 1.A.1 1.B | Energy supply | 7,489 | 7,019 | 3,724 | 4,251 | 3,827 | 1,219 | 670 |
| 1.A.3 | Transport | 2,051 | 4,401 | 5,794 | 5,803 | 4,350 | 2,869 | 1,657 |
| | Industry | 5,710 | 3,859 | 2,744 | 2,706 | 2,393 | 1,405 | 1,215 |
| 1.A.2 | Energy Use of Fuels | 4,124 | 2,464 | 1,605 | 1,603 | 1,334 | 903 | 740 |
| 2. | Ind. Processes | 1,586 | 1,395 | 1,139 | 1,103 | 1,059 | 502 | 475 |
| 1.A.4 1.A.5 | Other areas | 2,653 | 2,720 | 1,266 | 1,076 | 823 | 608 | 441 |
| 3. | Agriculture | 2,038 | 1,769 | 1,706 | 1,726 | 1,698 | 1,642 | 1,584 |
| 4. | LULUCF | -4,782 | -7,236 | -173 | -697 | -2,089 | -1,704 | -2,187 |
| 5. | Waste | 697 | 828 | 380 | 354 | 285 | 240 | 206 |
| | | | | | | | | |
| | $CO_2$ with LULUCF | 11,921 | 9,644 | 12,480 | 12,361 | 8,655 | 4,031 | 1,519 |
| | $CO_2$ without LULUCF | 16,767 | 16,936 | 12,701 | 13,082 | 10,764 | 5,752 | 3,719 |
| | $CH_4$ with LULUCF | 2,926 | 2,711 | 1,917 | 1,923 | 1,788 | 1,498 | 1,383 |
| | $CH_4$ without LULUCF | 2,925 | 2,711 | 1,908 | 1,921 | 1,786 | 1,496 | 1,381 |
| | $N_2O$ with LULUCF | 790 | 728 | 743 | 698 | 686 | 659 | 640 |
| | $N_2O$ without LULUCF | 727 | 672 | 703 | 674 | 667 | 644 | 629 |
| | HFCs | 0 | 130 | 282 | 222 | 142 | 77 | 34 |
| | PFCs | 210 | 128 | 4 | 0 | 0 | 0 | 0 |
| | SF6 | 10 | 19 | 17 | 16 | 16 | 14 | 11 |
| | NF3 | | | | | | | |
| | TOTAL with LULUCF | 15,857 | 13,360 | 15,442 | 15,220 | 11,287 | 6,279 | 3,587 |
| | TOTAL without LULUCF | 20,638 | 20,596 | 15,615 | 15,916 | 13,376 | 7,983 | 5,774 |

***Table 11: Projections of GHG emissions and removals under the With Additional Measures scenario***

## II.F.5 EU ETS in projections

Emissions from EU ETS-liable entities in the projections were determined based on the assumptions presented below. In the electricity and heat production sector, all companies in central energy supply (including TEŠ, TE-TOL, Thermal power plant Brestanica (TEB), and all new large units) were assumed to be included in the EU ETS. In local energy supply (district heating), the EU ETS share was determined separately for each fuel type, distinguishing between combined heat and power (CHP) units and boilers, based on the 2020 share. For the fuel combustion sector in industry, the EU ETS share was determined based on the 2020 EU ETS share for each industry and fuel type, while in industrial processes, the EU ETS share was allocated according to specific processes. All assumptions were additionally validated against 2021 data.

The scope of the EU ETS changed in 2013 in line with EU legislation, leading to the exit of several companies from the system, while Talum, a producer of primary and secondary aluminium, was fully incorporated. To ensure the comparability of results, the same EU ETS scope from 2013 onward was applied to the pre-2013 period. Differences appear in industrial emissions, affecting both fuel combustion and industrial process emissions.

In 2030, emissions from EU ETS-liable sources are projected to reach 5,624 kt $CO_2$-eq in the With Measures scenario and 4,930 kt $CO_2$-eq in the With Additional Measures scenario. In both cases, emissions are slightly higher than in 2022, when coal consumption was lower due

to the prolonged shutdown of TEŠ, and natural gas consumption in industry declined as a result of measures implemented in response to heightened geopolitical tensions. Under both scenarios, emissions are projected to decrease significantly by 2040. In the With Measures scenario, emissions decline to 2,922 kt $CO_2$-eq, representing a 40% reduction compared to 2022, while in the With Additional Measures scenario, they drop to 1,118 kt $CO_2$-eq, a 77% reduction. In the With Measures scenario, emissions increase across all sectors by 2030 compared to 2022, and the same is projected in the With Additional Measures scenario, except for industry. However, by 2040, emissions decrease across all sectors, with the exception of industrial processes in the With Measures scenario. By 2040, the largest reductions are observed in fugitive emissions, which decrease by 100%, and emissions from energy transformations, which decline by 79%—a sector that accounts for the largest share of total emissions. In the With Additional Measures scenario, reductions by 2040 are projected as follows: a 100% reduction in fugitive emissions, a 67% reduction in emissions from energy transformation, a 70% reduction in emissions from industrial processes, and a 51% reduction in emissions from industry.

| | | 2005 | 2020 | 2022 | 2025 | 2030 | 2040 | 2025 | 2030 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Actual emissions | | | Projections under the With Measures scenario | | | Projections under the With Additional Measures scenario | | |
| 1. Energy | [kt $CO_2$] | 7,779 | 5,414 | 4,212 | 4,982 | 4,942 | 2,217 | 4,723 | 4,243 | 915 |
| A. Fuel Combustion | [kt $CO_2$] | 7,696 | 5,350 | 4,171 | 4,932 | 4,891 | 2,217 | 4,674 | 4,196 | 915 |
| 1. Energy Transformation | [kt $CO_2$] | 6,301 | 4,327 | 3,230 | 3,804 | 3,789 | 1,033 | 3,724 | 3,370 | 547 |
| 2. Industry and Construction | [kt $CO_2$] | 1,395 | 1,024 | 941 | 1,128 | 1,102 | 1,184 | 949 | 826 | 368 |
| B. Fugitive Emissions | [kt $CO_2$] | 82 | 63 | 41 | 50 | 51 | 0 | 49 | 47 | 0 |
| 2. Industrial Processes and Product Use | [kt $CO_2$ eq] | 959 | 681 | 649 | 662 | 682 | 704 | 666 | 687 | 203 |
| TOTAL | [kt $CO_2$ eq] | 8,738 | 6,095 | 4,861 | 5,645 | 5,624 | 2,922 | 5,389 | 4,930 | 1,118 |

***Table 12: Actual EU ETS emissions in 2005, 2020, and 2022, along with projected emissions under the With Measures and With Additional Measures scenarios until 2040 (Source: EARS, IJS-CEU, AIS)***

| | | 2005 | 2020 | 2022 | 2025 | 2030 | 2040 | 2025 | 2030 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Actual emissions | | | Projections under the With Measures scenario | | | Projections under the With Additional Measures scenario | | |
| 1. Transformation | [%] | 98% | 96% | 95% | 95% | 96% | 90% | 95% | 96% | 88% |
| 2. Industry and Construction | [%] | 57% | 60% | 59% | 61% | 60% | 59% | 59% | 62% | 50% |
| B. Fugitive Emissions | [%] | 14% | 15% | 13% | 14% | 14% | 0% | 14% | 14% | 0% |
| 2. Industrial Processes and Product Use | [%] | 69% | 59% | 57% | 60% | 65% | 72% | 60% | 65% | 43% |
| TOTAL | [%] | 42% | 38% | 31% | 34% | 34% | 26% | 34% | 37% | 19% |

***Table 13: Share of EU ETS Emissions in Total GHG Emissions by Sector***

## II.F.6 Non-ETS emissions in projections

For 2030, the European Commission has set a 27% emission reduction target for Slovenia compared to 2005 levels. This target will be translated into annual emission allocations for the 2021–2030 period. Currently, target values have been defined for the 2021–2025 period. In NECP, Slovenia has set a more ambitious goal, aiming to reduce non-ETS emissions by at least 28%.

| | | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|
| Slovenia | [kt $CO_2$ eq] | 11,403 | 11,108 | 10,814 | 10,515 | 10,217 |

***Table 14: Target trajectory for non-ETS emissions in the 2021–2025 period (Source: European Commission)***

Projections for emissions from sources not covered by the EU ETS were calculated as the difference between total emissions and EU ETS emissions.

In the With Measures scenario, non-ETS emissions increase from 2022 to 2025, reaching 10,835 kt $CO_2$-eq, before declining to 10,701 kt $CO_2$-eq by 2030 and 8,372 kt $CO_2$-eq by 2040. In the With Additional Measures scenario, emissions rise to 10,528 kt $CO_2$-eq by 2025, then decline to 8,446 kt $CO_2$-eq by 2030 and 4,656 kt $CO_2$-eq by 2040.

In 2022, emissions were below the target trajectory. By 2030, emissions in the With Measures scenario are projected to be 29% lower than in 2005, while in the With Additional Measures scenario, they are also 29% lower than in 2005. Therefore, the 2030 reduction target is achieved in the With Additional Measures scenario.

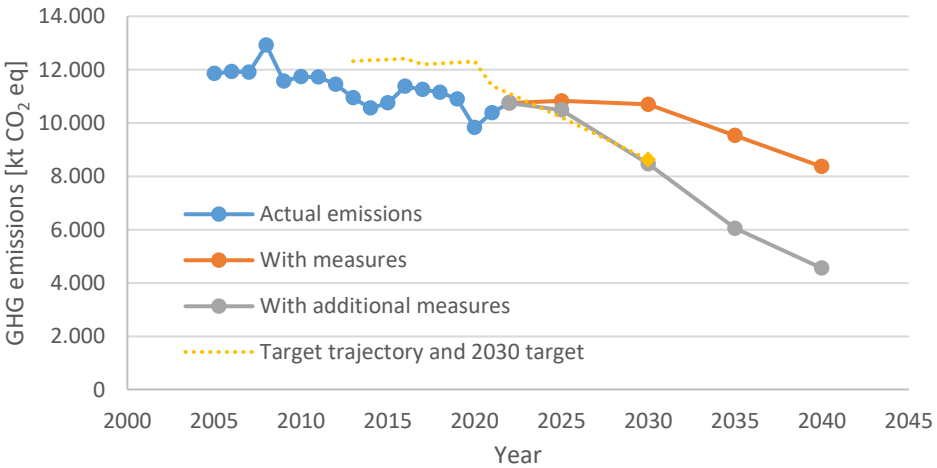


***Figure 28: Historical trajectory of non-ETS emissions from 2005 to 2022, along with projections under the With Measures and With Additional Measures scenarios for 2025 to 2040, compared to the target trajectory for 2013–2020 and 2021–2025, as well as the 2030 target (Source: EARS, IJS-CEU, AIS)***

The largest source of non-ETS emissions is transport, accounting for 54% of all non-ETS emissions in 2022, compared to a 37% share in 2005. In 2020, due to the pandemic and related measures, its share declined to 47%. In the With Measures scenario, transport's share increases to 58% in 2030, before declining to 54% in 2040. In the With Additional Measures scenario, its share is projected to be 52% in 2030, followed by a sharp decrease

to 36%, driven by a substantial reduction in emissions. In 2022, the second-largest sources of non-ETS emissions were agriculture and other sectors, but their trends diverge significantly by 2040. In the With Measures scenario, agriculture—alongside transport—is the only sector where emissions increase by 2040, raising its share to 21%. The increase in share is significantly greater in the With Additional Measures scenario, despite the decrease in emissions; however, the reduction in other sectors is even greater. In 2030, agriculture's share is 20%, rising to 34% by 2040. The other energy use sector (other sectors), which accounted for 12% of non-ETS emissions in 2022, is projected to decline to 9% and10% in 2030 and to 8% and 10% in 2040. In 2040, non-ETS emissions from industry and construction surpass those from this sector, accounting for 10% and 8%.

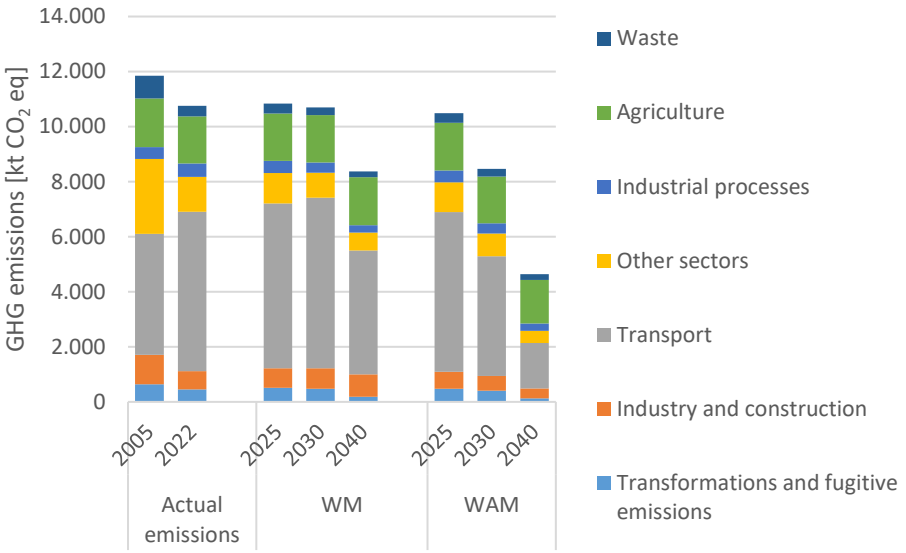


***Figure 29: Structure of non-ETS emissions in 2005 and 2022, and projections for 2025, 2030 and 2040 (Source: IJS-CEU, AIS)***

| GHG [kt $CO_2$ eq] | Actual emissions | | | Projections under the With Measures scenario | | | Projections under the With Additional Measures scenario | | | With Measures | With Additional Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sector \ Year** | **2005** | **2020** | **2022** | **2025** | **2030** | **2040** | **2025** | **2030** | **2040** | 2030/2005 | 2030/2005 |
| Transformation | 635 | 536 | 452 | 505 | 477 | 186 | 478 | 410 | 123 | -25% | -36% |
| Industry and Construction | 1,069 | 679 | 665 | 715 | 745 | 806 | 654 | 508 | 372 | -30% | -52% |
| Transport | 4,399 | 4,574 | 5,793 | 5,993 | 6,191 | 4,507 | 5,803 | 4,350 | 1,657 | 41% | -1% |
| Other sectors | 2,720 | 1,358 | 1,266 | 1,106 | 914 | 649 | 1,076 | 823 | 441 | -66% | -70% |
| Industrial process | 436 | 473 | 490 | 435 | 370 | 267 | 437 | 372 | 271 | -15% | -15% |
| Agriculture | 1,769 | 1,773 | 1,706 | 1,726 | 1,719 | 1,750 | 1,726 | 1,698 | 1,584 | -3% | -4% |
| Waste | 828 | 440 | 380 | 354 | 285 | 206 | 354 | 285 | 206 | -66% | -66% |
| **TOTAL** | **11,855** | **9,834** | **10,752** | **10,835** | **10,701** | **8,372** | **10,528** | **8,446** | **4,656** | **-10%** | **-29%** |
| Target trajectory and 2030 TARGET | | 12,307 | 11,108 | 10,217 | 8,633 | | 10,217 | 8,633 | | | |

***Table 15: Emissions from sources not covered by the EU ETS (non-ETS) in 2005, 2020, 2022 and with projections under the With Measures and With Additional Measures scenarios by 2040***

## II.F.7 Comparison with projections from previous reports

The projections under the With Measures and With Additional Measures scenarios from the Sixth National Communication were, as expected, higher than the most recent projections. The lower 2015 emissions in the updated projections are primarily due to the prolonged economic crisis, which led to decreased activity in the industrial and transport sectors, a faster transition away from light fuel oil (LFO)—particularly in favour of wood biomass—in households and the service sector, and reduced emissions in the energy transformation sector. In the transport sector, changing fuel price differentials between Slovenia and neighbouring countries have also played a significant role, as the proportion of foreign vehicles refuelling in Slovenia has been declining. Lower emissions were also recorded in agriculture, primarily due to a smaller livestock population, and in the waste sector, as measures were implemented more quickly than originally anticipated (with a faster reduction in the amount of biodegradable waste sent to landfill). Post-2020 implementation of measures is comparable across earlier projections, as emissions in 2030 relative to 2020 are lower by 6% or 7% in all three projections (Sixth National Communication and BR2), whereas in the projection from the Seventh National Communication, emissions are 9% lower. Emissions under the projections in the With Measures and With Additional Measures scenarios, as presented in BR4 and the Eighth National Communication, are very similar and are therefore shown as a single set of projections. These projections differ from earlier ones primarily in the With Additional Measures scenario, which reflects a higher level of ambition regarding emission reduction targets, in line with the Paris Agreement. This is already evident by 2030, when projected emissions are more than 20% lower compared to 2020. The projections presented in this report show lower emissions under the With Additional Measures scenario after 2030 compared to previous projections, with a more pronounced difference in the With Measures scenario. This is expected, as each new projection incorporates a greater number of implemented or adopted measures.

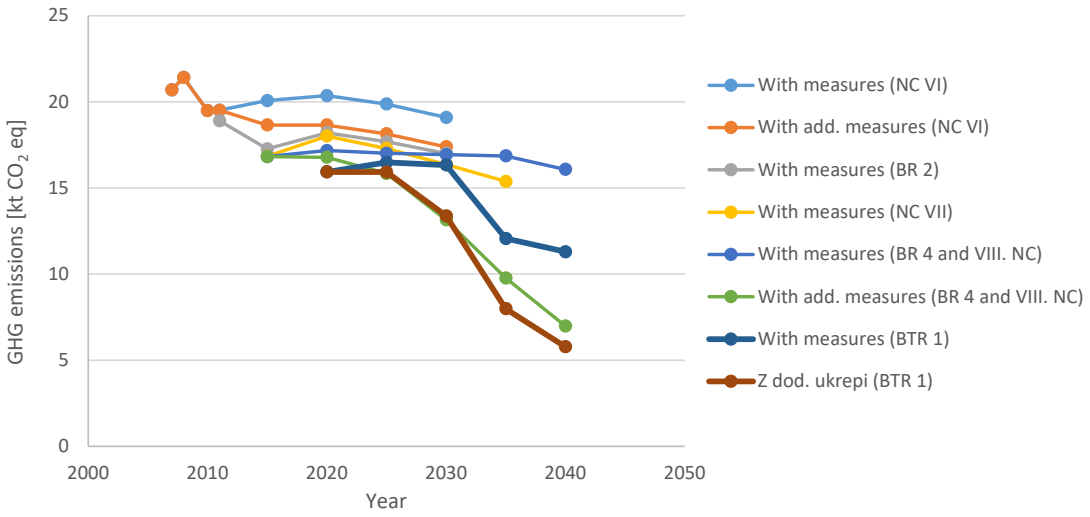


***Figure 30: Comparison of projections from the Sixth National Communication (VI NC), the Second Biennial Report (BR2), the Seventh National Communication (VII NC) and the joint projections of the Fourth Biennial Report and the Eighth National Communication (BR4 and VIII NC), with the projections presented in this report (BTR1)***

## II.F.8 Key parameters

The key parameters of the projections are described in detail in *the Revised Final Report on Updated Technical Bases for NECP*[92].

Selected key parameters of the projections are also included in the CTF tables, which, together with the textual report, form the BTR.

## II.F.9 Sensitivity of projections

In Slovenia, the future development of the transport sector remains the most uncertain, while also representing the largest source of total GHG emissions and of emissions within the non-ETS sector. A sensitivity analysis was therefore conducted for this sector, assessing the impact of different transit development scenarios and comparing the effects of various implementation scenarios for transport and environmental policy measures within the transport sector.

| [%] | **2020** | **2025** | **2030** | **2035** | **2040** |
|---|---|---|---|---|---|
| Projections under the With Measures scenario (O1) | 100 | 130 | 134 | 120 | 98 |
| Projections under the With Additional Measures scenario (O2) | 100 | 126 | 94 | 62 | 36 |
| Lower scope of additional measures (O3) | 100 | 126 | 99 | 67 | 40 |
| Projection under the With Additional Measures scenario with a lower share of biofuels (O4) | 100 | 126 | 101 | 67 | 39 |
| Projection under the With Additional Measures scenario without the abolition of excise duty refunds for commercial freight and passenger transport (O5) | 100 | 127 | 107 | 70 | 40 |
| Projection under the With Additional Measures scenario with a lower share of biofuels and a high share of foreign vehicles refuelling in Slovenia (O6) | 100 | 149 | 121 | 81 | 46 |

***Table 16: Sensitivity of GHG emissions projections in the transport sector to assumptions related to transit traffic and the implementation of measures in the transport sector***

The projection under the With Measures scenario shows the highest emissions among the sensitivity analysis scenarios. The results are compared with emissions in 2020, which were significantly low due to the impact of measures taken during the spread of the SARS-CoV-2 virus. Therefore, the apparent increase in emissions by 2030 in some scenarios may be slightly misleading. The sensitivity analysis focused on the range of various scenarios under the With Additional Measures projections. Among these, the highest emissions occur in the scenario with a lower share of biofuels and a high share of foreign vehicles refuelling in Slovenia (O6), where emissions reach 121% of 2020 levels by 2030, and 46% by 2040. The lowest emissions are observed in the With Additional Measures scenario (O2), where emissions reach 94% of 2020 levels by 2030 and 36% by 2040. The biofuel blending ratio has a significant impact on emission reductions: in the scenario with a lower share of biofuels (O4), the emissions index is 7 percentage points higher in 2030 and 3 percentage points higher in 2040 compared to the With Additional Measures scenario. In the With Additional Measures scenario, the abolition of excise duty refunds leads to a significant reduction in fuel sales to foreign freight vehicles. If this measure were not implemented (O5), the emissions index in 2030 would be 8 percentage points higher. The narrowing of the emissions index range across scenarios in the 2040 sensitivity analysis is the result of an increased share of zero-emission fuels in transport, particularly electricity.

[92] Dopolnjeno Končno poročilo o posodobljenih strokovnih podlagah NECP, IJS CEU et all, december 2024 (Revised Final Report on Updated Technical Bases for NECP, JS CEU et all, December 2024).

The sensitivity analysis of total emissions to the transport scenarios presented above indicates that trends in transport emissions have a very significant impact on total emissions. In 2030, emissions in the scenario representing the upper bound of the sensitivity range—O6—amount to 14.6 Mt $CO_2$ eq, which is 9% higher than the emissions projected under the With Additional Measures scenario.

| [%] | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|
| Projections under the With Measures scenario (O1) | 100 | 103 | 102 | 76 | 71 |
| Projections under the With Additional Measures scenario (O2) | 100 | 100 | 84 | 50 | 36 |
| Lower scope of additional measures (O3) | 100 | 100 | 85 | 52 | 37 |
| Projection under the With Additional Measures scenario with a lower share of biofuels (O4) | 100 | 100 | 86 | 51 | 37 |
| Projection under the With Additional Measures scenario without the abolition of excise duty refunds for commercial freight and passenger transport (O5) | 100 | 100 | 88 | 52 | 37 |
| Projection under the With Additional Measures scenario with a lower share of biofuels and a high share of foreign vehicles refuelling in Slovenia (O6) | 100 | 107 | 92 | 55 | 39 |

***Table 17: Sensitivity of total GHG emissions projections to assumptions related to transit traffic and the implementation of transport and environmental policy measures***

The sensitivity analysis revealed an even greater impact on non-ETS emissions, as transport accounts for more than 50% of these emissions.

| [%] | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|
| Projections under the With Measures scenario (O1) | 100 | 110 | 109 | 97 | 85 |
| Projections under the With Additional Measures scenario (O2) | 100 | 107 | 86 | 64 | 47 |
| Lower scope of additional measures (O3) | 100 | 107 | 88 | 66 | 49 |
| Projection under the With Additional Measures scenario with a lower share of biofuels (O4) | 100 | 107 | 89 | 66 | 49 |
| Projection under the With Additional Measures scenario without the abolition of excise duty refunds for commercial freight and passenger transport (O5) | 100 | 108 | 92 | 67 | 49 |
| Projection under the With Additional Measures scenario with a lower share of biofuels and a high share of foreign vehicles refuelling in Slovenia (O6) | 100 | 118 | 98 | 72 | 52 |

***Table 18: Sensitivity of non-ETS GHG emissions projections to assumptions related to transit traffic and the implementation of sustainable transport and environmental policy measures***

## II.F.10. Methodology of projections

A broad set of models was used to develop the emissions projections. In preparing the projections for the updated NECP, the main models and sub-models were updated compared to those used in BR5 and the Eighth National Communication (NC8). A new model was introduced for the LULUCF sector. The models are described in more detail in the Annex, while

the changes and upgrades to the models are outlined later in this chapter. The following models were used and updated:

1. **REES-SLO** (**R**eference **E**nergy and **E**missions Model for Slovenia (**SLO**), simulation model)
   2. **REES-SLO – buildings** (sub-model for buildings in the household and services sectors)
   3. **REES-SLO – transport** (sub-model for energy use in transport)
4. **PRIMOS** (transport activity model)
5. **LULUCF model** (*Forest Development Simulator using Machine Learning Methods – MLSF*)
6. **Agriculture model** (AGRI AIR, livestock and land use)
7. **Electricity supply optimisation model** (optimisation model for capacity expansion planning)
8. **Macroeconomic model** (GEM, general equilibrium model)

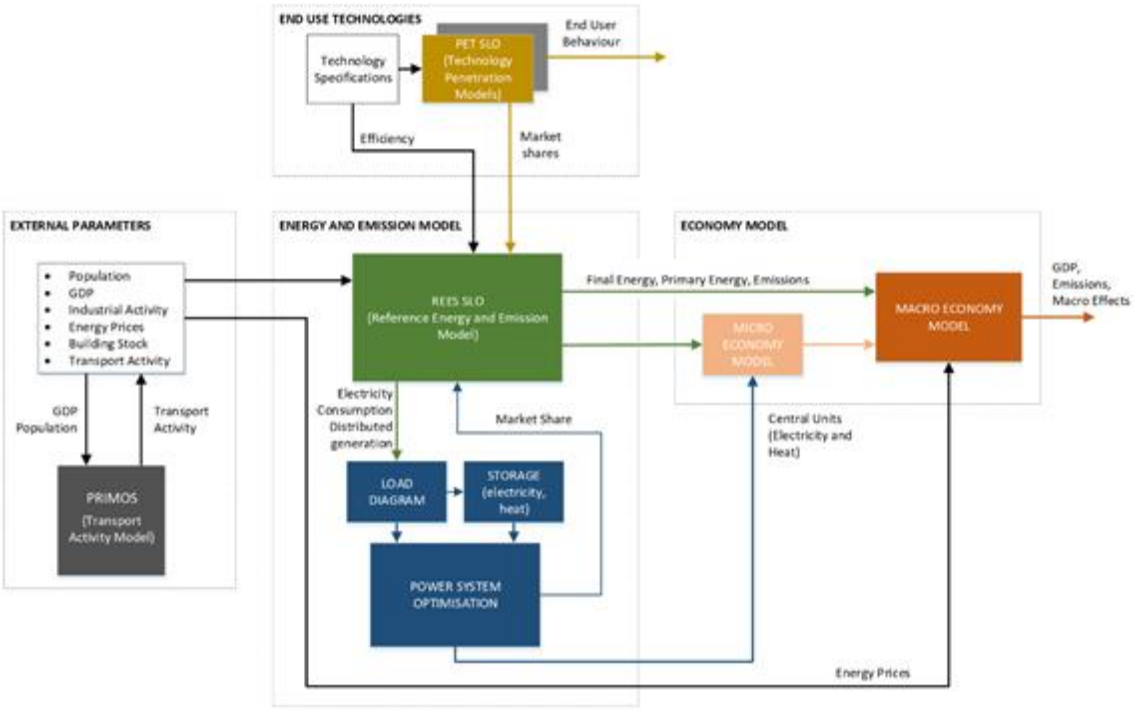


***Figure 31: Models used for preparing projections in the NECP and their interlinkages***

**New LULUCF model**

To prepare projections of GHG emissions and removals in the LULUCF sector, a *Forest Development Simulator using Machine Learning Methods (MLSF)*[93] was developed and applied. The simulator is designed to support projections of key processes in forest ecosystems, such as increment, mortality, and diameter and height growth. The model is described in more detail in the article (Jevšenak[93]). It enables the simulation of the impact of forest management on the dynamics of carbon sinks and provides guidance for the development of future forest policy in Slovenia. It was used to produce projections for forest land for the period up to 2050 as part of the NECP update.

In modelling carbon stock on forest land using the MLFS model, three key assumptions were defined: regarding the scope or volume of harvesting, the impact of global warming, and the occurrence of natural disturbances. Although climate data are not mandatory, they must be

[93] Jevšenak, J., Arnič, D., Krajnc, L., & Skudnik, M. (2023). Machine Learning Forest Simulator (MLFS): R package for data-driven assessment of the future state of forests. Ecological Informatics, 75, Article 102115.

provided at monthly intervals for both the entire calibration period and the projected simulation period. These data include average monthly air temperature and precipitation. Natural disturbances have significantly affected the carbon sink dynamics in Slovenian forests over the past decade. Due to increased harvesting, they have substantially reduced the sink in this sector. The modelling assumed that various types of natural disturbances would occur every second step (i.e. every 6–12 years), affecting 5% of forest areas annually. To account for the impact of competition on tree mortality, a dynamic mortality rate was applied, following the method presented by Monserud and Sterba (1999)[94], where mortality increases proportionally with the intensity of competition. For modelling harvest levels, a long-term average ratio between final felling and thinning was used, amounting to approximately 20:80.

**Upgrades to other models**

The upgrade of other models for GHG emissions projections was carried out between 2022 and 2024 as part of the revision of the Integrated National Energy and Climate Plan and included the following:

- The building model in REES-SLO was upgraded with a new structure covering 13 building types in the service sector, allowing for a more accurate calculation of specific energy use for heating, cooling, ventilation, lighting, hot water, and other electricity use.
- In the transport model in REES-SLO, the vehicle fleet sub-model was improved. Imported used vehicles registered for the first time were treated separately from new vehicles, and their age structure was incorporated into the model. Assumptions regarding the life-cycle curves for different vehicle technologies were updated. Sustainable aviation fuels were introduced into the model. Additionally, transport activity volumes were calculated within the model in line with fuel sales volumes in Slovenia.
- The PRIMOS model, the integrated transport model of Slovenia, was used for the first time to analyse activity across settlement categories (larger cities, urban municipalities, others) and various trip purposes. This enabled more targeted policy design and a more realistic assessment of the effects of measures. A sub-model was also developed for transport labour modelling, enabling the analysis of additional policies and measures that cannot be directly modelled in the existing PRIMOS model—such as changes in parking policy, spatial planning measures, and the development of sustainable mobility within zones.
- The electricity supply optimisation model was upgraded and expanded to include different types of electricity storage systems (ESS). In addition to pumped-storage hydropower plants, the model now includes systems such as battery storage and hydrogen production.
- The AGRI AIR agriculture model was updated to incorporate revisions that Slovenia has implemented in its emissions reporting. It was enhanced to assess the effects of upcoming new techniques for reducing GHG emissions in agriculture—specifically for mitigating enteric methane from livestock and including the use of urease, nitrification, and denitrification inhibitors to reduce nitrous oxide emissions from fertilisation of agricultural crops.

The models and their upgrades are described in *the Revised Final Report on Updated Technical Bases for NECP*[95]. More detailed model descriptions were also provided in the reports of the LIFE Climate Path 2050 project[96].

[94] Monserud R.A., Sterba, H. (1999). Modelling individual tree mortality for Austrian forest species. Forest Ecology and Management, 113, 109- 123.

[95] Dopolnjeno Končno poročilo o posodobljenih strokovnih podlagah NECP, IJS CEU et all, december 2024 (Revised Final Report on Updated Technical Bases for NECP, JS CEU et all, December 2024).

[96] LIFE ClimatePath2050 Deliverable C2.1: Documentation of Methods and Models for Climate Mitigation Mid-century Strategy Scenario Analysis, Final report Part 1: Summary, Part 2: Energy sector models, Part 4: Other IPCC sectors, IJS CEU et all., 2021.
For the LULUCF model, see the reference provided above.

## II.F.11 Key indicators for assessing progress towards the NDC

Progress towards achieving the EU's joint NDC can only be determined at the EU level; information on projections for the relevant key indicators is available in the EU's BTR.

Slovenia contributes to the achievement of the EU's joint NDC by 2030 within the framework of the climate and energy policy, i.e. by meeting its targets under ESR and LULUCF Regulation. An analysis of Slovenia's progress in meeting its targets is presented in the chapter describing the emission trends in the non-ETS sector (0II.F. Projections of GHG emissions and removals, as applicable).

# II.G. Other information

| |
|---|
| 103. Each Party may provide any other information relevant to tracking progress made in implementing and achieving its NDC under Article 4 of the Paris Agreement. |

According to paragraph 103 of the annex to decision 18/CMA.1, 'each Party may provide any other information relevant to tracking progress made in implementing and achieving its NDC under Article 4 of the Paris Agreement'. All relevant information can be found in sections 3.1 to 3.6, above. Hence, no additional information is provided here.

# III. Information related to climate change impacts and adaptation pursuant to Article 7 of the Paris Agreement

104. Each Party should provide information related to climate change impacts and adaptation under Article 7 of the Paris Agreement, as appropriate. Providing such information is not mandatory.
105. The information referred to below could facilitate, inter alia, recognition of the adaptation efforts of developing country Parties.

## III.A. National circumstances, institutional arrangements and legal frameworks

106. Each Party should provide the following information, as appropriate:
(a) National circumstances relevant to its adaptation actions, including biogeophysical characteristics, demographics, economy, infrastructure and information on adaptive capacity;
(b) Institutional arrangements and governance, including for assessing impacts, addressing climate change at the sectoral level, decision-making, planning, coordination, addressing cross-cutting issues, adjusting priorities and activities, consultation, participation, implementation, data governance, monitoring and evaluation, and reporting;
(c) Legal and policy frameworks and regulations.

Slovenia's climate is influenced by several factors, the most important being its varied topography, geographical location, the orientation of mountain ranges, and proximity to the sea. The combination of these factors results in a highly diverse climate. Slovenia features three predominant climate types: in the east, a temperate continental climate; in central Slovenia, a sub-Alpine climate (with Alpine conditions in mountainous areas); and to the west of the Dinaric-Alpine barrier, a sub-Mediterranean climate. This climatic diversity is reflected in climate variables, which exhibit different daily, seasonal and interannual variability. Climatic differences also affect the adaptive capacity of individual regions to the impacts of climate change.

Around 50% of Slovenia's population lives in urban areas, which account for more than 90% of total employment. Like many other countries, Slovenia will experience climate change in the context of an ageing society. In 2022, people aged 65 and over made up just over 21% of the population. Projections suggest that by 2100, more than 32% of Slovenia's population will fall into this age group.

According to the Slovenian Tourism Strategy 2022–2028, tourism contributed 9.9% to Slovenia's GDP in 2019 and represents a key economic sector. However, it is also highly sensitive to the impacts of climate change. Winter tourism is among the sectors particularly vulnerable to climate-related risks. Slovenia has a well-developed infrastructure network. The Slovenian road network comprises approximately 39,000 km of roads, which are categorised as either state or municipal. Municipal roads are owned by local authorities, while state roads fall under national ownership. State roads include motorways, expressways, main roads, and regional roads. The total length of the railway network in Slovenia is 1,207 km, of which 609 km are electrified.

Under the Government of the Republic of Slovenia Act, approved by referendum on 27 November 2022, responsibility for climate-related matters has been assigned to the newly established Ministry of the Environment, Climate and Energy (MECE). In fulfilling its climate-related responsibilities, MECE cooperates with other ministries and relevant stakeholders. In 2016, an inter-ministerial working group on climate change adaptation was established, comprising representatives from all relevant ministries, agencies, and government offices. The group was tasked with implementing the national adaptation strategy and ensuring both horizontal and vertical coordination of adaptation policy. However, due to its large membership

(over 40 participants), the group met infrequently and functioned primarily through bilateral cooperation. As part of the process of preparing the new national adaptation strategy, the inter-ministerial working group will be restructured into a more operational format. In the field of early warning system for natural and other disasters, the lead institutions are EARS and the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief.

Slovenia does not have regional government authorities; however, it comprises 12 statistical/development regions, each with regional development and energy agencies that fulfil a coordinating role for various purposes. These agencies are involved in planning and preparing new regional spatial plans and in negotiating the allocation of European funds. Under the draft Climate Law, regional agencies would also be responsible for preparing regional climate adaptation action plans.

Slovenia has 212 local communities with varying competences. The majority of municipal responsibilities relate to spatial planning, building construction, local public services, environmental protection, primary education, childcare, and other areas. The draft Climate Law also foresees the preparation of climate adaptation action plans for all urban municipalities.

Climate data and analysis under the responsibility of MECE are provided by EARS, which performs the functions of the national meteorological, hydrological and seismological service. It provides high-quality, verified data, analyses and forecasts on weather, climate, climate variability and change, phenological development, air quality, the hydrological status of surface and groundwater, sea conditions, and seismic activity in Slovenia.

Slovenia also has a Climate Council, an independent scientific advisory body to the Government of the Republic of Slovenia on climate policy. The work of the members of the Climate Council, appointed for a six-year term, consists of providing scientific advice in the form of expert opinions and recommendations on both existing and proposed climate policy measures.

MECE has also recognised the Human Rights Ombudsman as an important stakeholder in the area of climate change adaptation. The Ombudsman is a constitutional institution and does not fall within the executive, judicial, or legislative branches of government. The Ombudsman operates independently and autonomously in relation to other state bodies.

Although Slovenia has made considerable efforts in climate change mitigation in the past, unfortunately adaptation has received far insufficient attention. The first strategic document in the field of adaptation – the Strategy for the Adaptation of Slovenian Agriculture and Forestry to Climate Change – dates back to 2008. Like the Strategic Framework for Climate Change Adaptation adopted in 2016, it no longer reflects the needs of the present day. While Slovenia adopted a Long-Term Climate Strategy 2050 in 2021 and has updated National Energy and Climate Plan in December 2024, a more robust and comprehensive regulatory framework for climate change adaptation will only be established through the forthcoming Climate Law, which is currently awaiting government consideration. Until then, the principal legal basis for climate change adaptation remains the ZVO-2 (Official Gazette of the Republic of Slovenia, No. 44/22).

## III.B. Impacts, risks and vulnerabilities, as appropriate

107. Each Party should provide the following information, as appropriate:
(a) Current and projected climate trends and hazards

**Climate projections**

EARS is running a project on climate change impact assessment in the 21st century. In 2018, EARS already prepared climate change assessments for the future and climate change impact assessments for some extreme events, such as heat waves, droughts, extreme precipitation phenomena, frost, high water conditions.

Climate projections are based on multi-model ensembles of simulations by different regional climate models of the initiative EURO-CORDEX (regional climate models with inputs based on CMIP5 global climate models), six for RCP4.5 and RCP8.5 and two for RCP2.6. Climate models, which are merely an approximation of the climate system, are constantly evolving. The current performance of computer systems introduces limitations to modelling at certain temporal and spatial scales, moreover, not all physical processes within the climate system can be resolved and simulated. In addition to this, certain atmospheric processes such as turbulence, cloud microphysics and convective precipitation are still poorly understood. Indicated limitations require simplifications, which can act as a source of systematic bias between the simulated and the real climate. To avoid misinterpretation of model results, adjustments to the observed or measured data are needed.

EARS observed a systematic bias of model temperature and precipitation data from measurements in Slovenia. Model simulations of future temperature and precipitation were corrected according to the aforementioned bias.

Using an ensemble of results from different models enables EARS to evaluate the uncertainties in model projections and to define the extent of future changes. Precipitation simulations are less reliable than temperature simulations, firstly due to complex nature of precipitation and secondly due to greater natural variability which contributes to difficulties in identifying the climate signal.

Future projections are presented mostly as a 30-year average deviation from the 30-year reference period in the past (1981–2010). 30-year averages are used to prevent misinterpretation of a short-term natural variability (e-g. annual or decadal oscillations) for a long-term climate signal. The average over a long time period thus gives information on the actual (or future) climate.

To analyze future climate, EARS divided the 21st century into three projection periods:

• 1st period (near future) between 2011-2040,

• 2nd period (mid-century) between 2041-2070,

• 3rd period (end of the century) between 2071-2100.

To show the characteristics of seasonal variations, shorter time periods within a year were considered, namely four meteorological seasons.

To account for regional differences, six smaller spatial regions within Slovenia were also considered according to the objective climate classification:

- submediterranean climate,
- wet climate of hilly region,
- moderate climate of hilly region,
- subcontinental climate of northeastern region,
- subcontinental climate of central region,
- alpine climate.

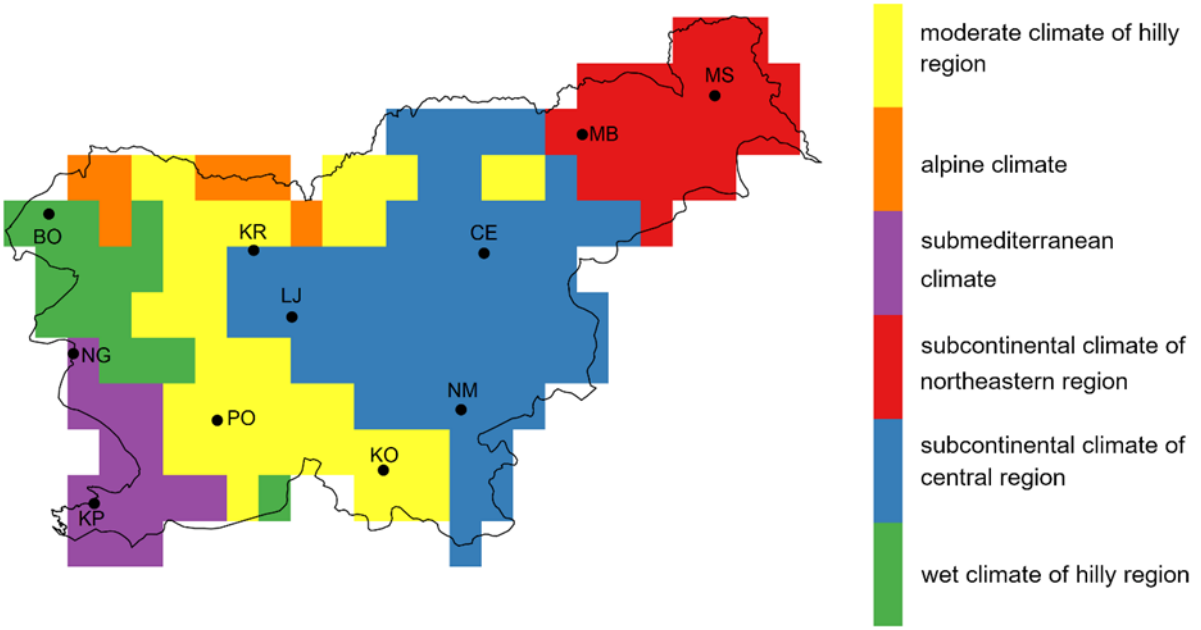


***Figure 32: Climate Regions in Slovenia at a 12 km Scale***

Climate projections are not deterministic forecasts of future state, but rather a description of multiple possible and probable climate outcomes in Slovenia based on global socio-economic development, serving as an estimate of future temperature and precipitation conditions.

Within the framework of the project “Climate Change Assessment in Slovenia Until the End of the 21st Century” (CCAS21) estimates of the changes for the multiple climate and climate related variables (also from impact models) were prepared (air temperature, soil temperature, amount of precipitation, different temperature and precipitation indices, phenological development of selected plant species, drought indices, surface water temperature, sea temperature, groundwater temperature, water content in soil, the quantitative status of watercourses, water supply of aquifers, snow conditions, changes in solar radiation, wind etc.)

**Temperatures**

The increase in air temperature in Slovenia will continue in the 21st century. The magnitude of the rise depends significantly on the GHG emissions scenario (Figure 5). Under the optimistic emissions scenario RCP2.6, the temperature will rise by approximately 1.3 °C by the end of the century compared to the 1981–2010 period. Under the moderately optimistic emissions scenario RCP4.5, it will rise by about 2 °C, and under the pessimistic emissions scenario RCP8.5, it will increase by about 4.1 °C. The greatest temperature increase will occur in winter, slightly less in summer and autumn, and the least in spring. The rise in temperature will significantly increase heat stress, in all emission scenarios the number of hot days will increase (Figure 6). The number and duration of heatwaves will also increase.

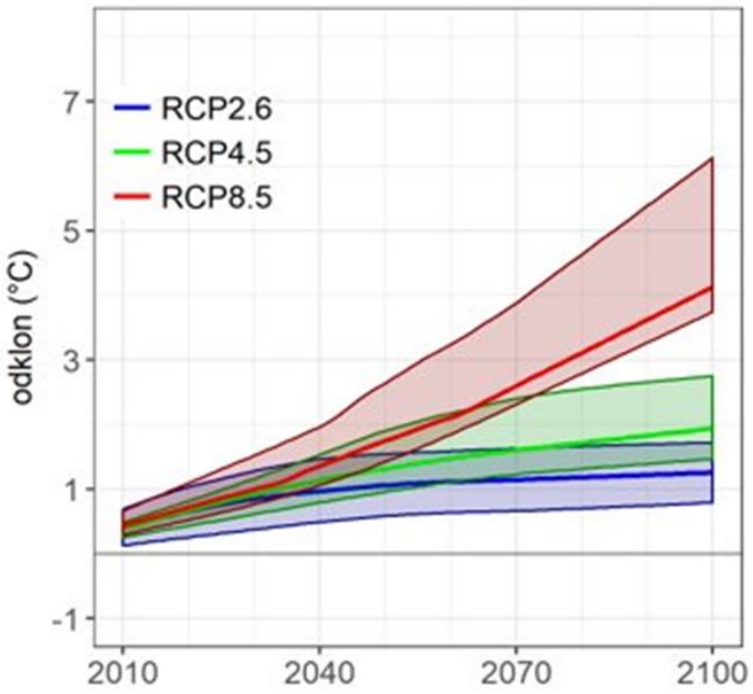


***Figure 33: The timeline of the change in the annual average air temperature in Slovenia by the end of the 21st century for three emissions scenarios, including the ranges of deviations. The values are shown relative to the average in the 1981–2010 period. The thick lines represent the smoothed median of model projections, and the upper and lower edges of the envelopes represent the smoothed maximum and minimum values of the model projections.***

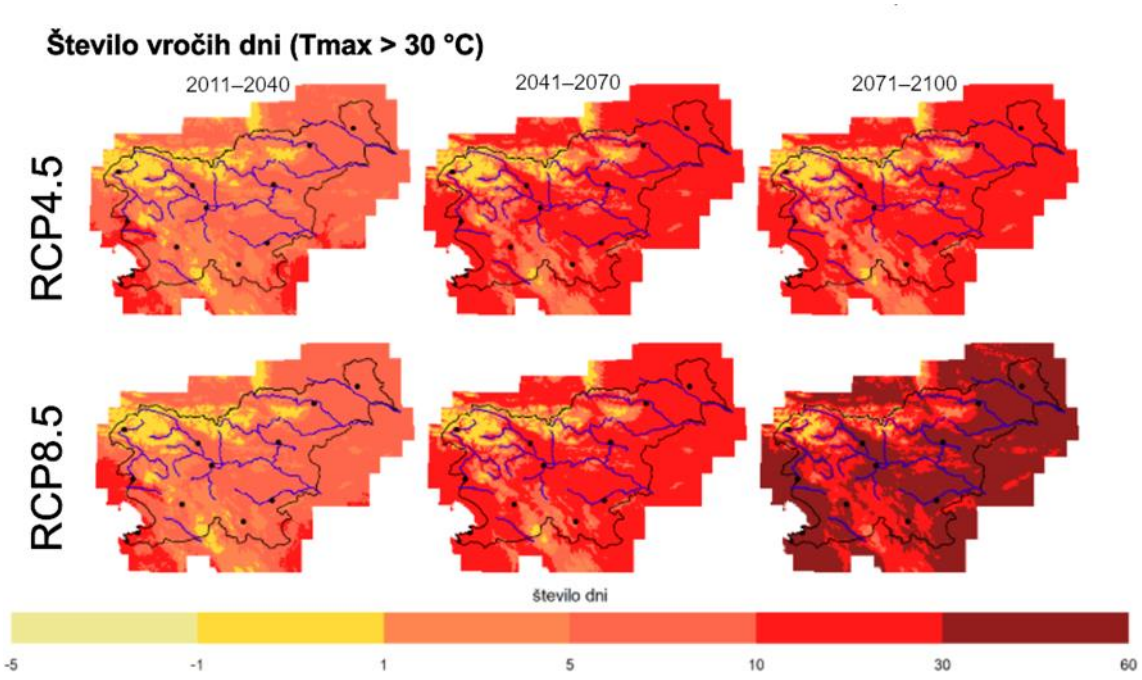


***Figure 34: Change in the average number of hot days per year in three projection periods relative to the 1981–2010 period for emissions scenarios RCP4.5 (above) and RCP8.5 (below).***

With the increase in air temperature, the soil surface layer will warm, both of which will affect the phenological development of plants and the length of the growing season. The spring phenological development of plants will occur earlier. Under the RCP4.5 scenario, the leafing of forest trees will be about two weeks earlier, and under the RCP8.5 scenario, it will be as much as approximately 40 days earlier than in the reference period 1981–2010. The length of

the growing season will extend in accordance with the rise in temperature, with an earlier start in spring and a later end in autumn.

### Precipitation

Under the moderately optimistic (RCP4.5) and pessimistic (RCP8.5) emissions scenarios, annual and winter precipitation levels are expected to increase significantly by the middle or end of the 21st century, although the uncertainty is high. For both emissions scenarios, the average increase in annual precipitation by the end of the century, compared to the 1981–2010 period, could reach up to 20 % (Figures 8 and 9).

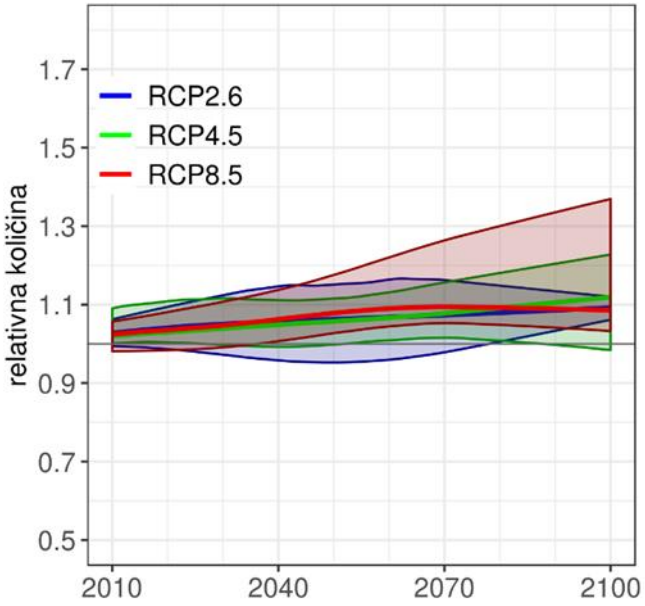


***Figure 35: Timeline of the change in annual precipitation levels in Slovenia through the end of the 21st century for three scenarios, including ranges of deviations. The values are shown relative to the average in the 1981–2010 period. The thick lines represent the smoothed median of model projections, and the upper and lower edges of the envelopes represent the smoothed maximum and minimum values of the model projections.***

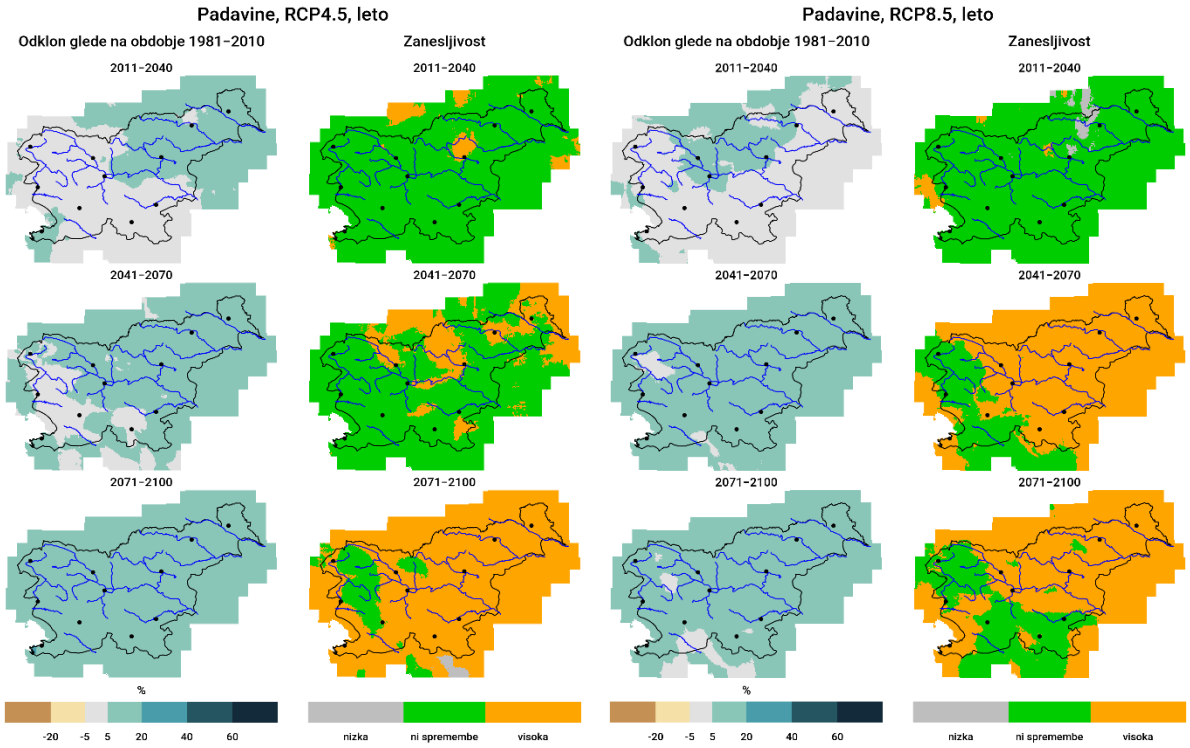

***Figure 36: Change in the average annual precipitation in three projection periods relative to the 1981–2010 period and the corresponding reliability of the change for emissions scenarios RCP4.5 (left) and RCP8.5 (right). Gray indicates low reliability (large differences among the ensemble models), green indicates no change (changes smaller than natural variability), and orange represents high reliability (consistent differences among the ensemble models).***

Winter precipitation will increase even more, especially in the eastern part of the country. By the middle of the century, winter precipitation in eastern Slovenia could increase by up to 40 %, and by the end of the century, under the RCP8.5 scenario, winter precipitation may increase by more than 60 %.

For other seasons, the direction and extent of precipitation changes vary greatly depending on the emissions scenario and partly on the model used, with changes generally smaller than the natural variability of precipitation. Indicators measuring extreme precipitation suggest that both the intensity and frequency of extreme precipitation events will increase, with the most pronounced rise occurring under the pessimistic (RCP8.5) emissions scenario.

**More information**

A detailed description of the methodology and results of the CCAS21 project is available in the synthesis report *Climate Change Assessment in Slovenia Until the End of the 21st Century*[97]. Graphical presentation of results for the analyzed climate and climate-related variables are available on *Atlas of climate projections*[98]. Numerical data for the results of selected climate variables are available in on the OPSI (Open Data Slovenia) portal[99].

(b) Observed and potential impacts of climate change, including sectoral, economic, social and/or environmental vulnerabilities;

Climate change significantly affects Slovenia's key economic sectors, natural environment, and societal well-being. Among the most critical vulnerabilities are energy security and food security, as both sectors are highly sensitive to climate change impacts. Extreme weather events such as droughts, heatwaves, and storms disrupt agricultural production, challenge water availability, and strain energy infrastructure, increasing economic losses and social inequalities. The observed rise in extreme climate events over the past decades, coupled with future projections, indicates that Slovenia must prioritize adaptation efforts in these areas to enhance resilience.

According to EEA, Slovenia suffered the highest per capita economic loss due to climate change in the EU between 1980 and 2023, amounting to EUR 8,700 per capita, with total economic losses of approximately EUR 17,5 billion[100]. Slovenia is particularly vulnerable due to its reliance on climate-sensitive sectors, including energy, agriculture, forestry, and tourism. More frequent and intense droughts, heatwaves, and storms cause significant economic damage, affecting productivity, infrastructure, and public health.

Slovenia's energy security is increasingly at risk due to climate change. Hydropower, a key electricity source, is becoming less reliable as precipitation patterns shift and droughts become more frequent. Extreme weather events are driving up electricity consumption, particularly during heatwaves, straining the power grid and increasing cooling costs. Floods, storms, and wildfires also threaten energy infrastructure, leading to higher maintenance and repair costs.

[97] https://meteo.arso.gov.si/uploads/probase/www/climate/text/sl/publications/OPS21_Porocilo.pdf
[98] https://meteo.arso.gov.si/uploads/probase/www/climate/OPS21/Priloge-app/
[99] https://podatki.gov.si/data/search?s=podnebne+projekcije
[100] Economic losses from weather- and climate-related extremes in Europe.

The transition to renewable energy sources is critical, but it requires significant investment in energy storage, grid adaptation, and climate-resilient infrastructure[101].

The trend of decreasing river discharge from Slovenia's territory continues, affecting hydropower potential. While 2013 and 2014 were above-average in terms of water availability, drier years have been recorded in the past two decades, including significantly below-average years such as 2003, 2011, 1983, 2022, 2007, and 2015. The year 2022 was particularly dry, contributing to energy production challenges.[102]

Hydropower remains a dominant renewable energy source in Slovenia, accounting for 88% of total renewable electricity production in 2020. However, its share has been gradually declining. In 2020, the share of electricity from renewable sources in gross electricity consumption reached 37.5%, an increase from the previous year, mainly due to higher river discharge and lower total electricity demand. When normalized for hydropower fluctuations, the share stood at 35.1%, exceeding Slovenia's NECP indicative target for 2020 by 1.6 percentage points.[103] Despite these positive short-term fluctuations, long-term projections indicate increasing variability in hydropower output due to changing precipitation patterns and more frequent droughts. Slovenia will need to diversify its renewable energy mix by investing in energy storage, grid flexibility, and alternative renewable sources to ensure a stable and resilient energy system in the face of climate change.

The frequency of agricultural droughts in Slovenia has been increasing in recent decades. In the last twenty years, seven major droughts have been classified as natural disasters, affecting food production and rural economies. Drought is occurring with increasing intensity, even in regions where it was previously uncommon. An additional risk is the rise of "flash droughts" in summer, which rapidly develop during heatwaves and severely impact crop yields. Projections indicate that both the frequency and intensity of agricultural droughts will continue to rise.[104]

[101] PP11 Heating and cooling degree days
[102] VD03 River balance
[103] EN19 Electricity production from renewable energy sources
[104] PP14 Agricultural droughts

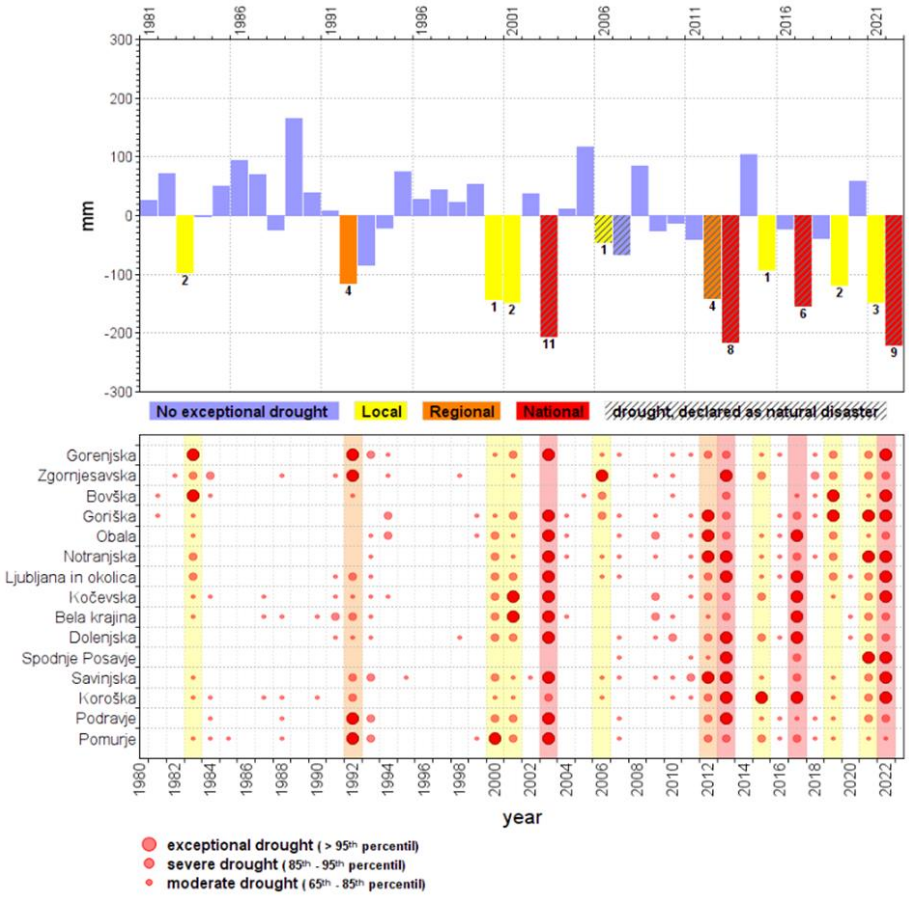


***Figure 37: Values of average summer meteorological water balance for Slovenia between 1981 and 2022 and number of regions with extreme agricultural drought in an individual year (above), and intensity of summer agricultural drought expressed in percentile class by regions for years between 1981 and 2022 in comparison to 1961–2020 period[105]***

As a net food importer, Slovenia is highly dependent on global markets for essential food products such as vegetables, fruit, potatoes, and pig meat. Climate-induced disruptions in global food supply chains, coupled with fluctuating market prices, increase economic and food security risks. While self-sufficiency remains relatively stable for milk, eggs, beef, and poultry, the overall share of domestically produced food has declined, reaching only one-fifth of total consumption in 2022. To enhance resilience, Slovenia must invest in climate-adaptive farming practices, expand irrigation systems, and promote sustainable land use strategies.[106]

Climate change is also affecting the physical environment. The Triglav Glacier has been retreating rapidly since the 1980s, splitting into two separate parts in 1992. Only temporary slowdowns in its retreat have been observed during years with above-average snow cover.[107] Sea levels along the Slovenian coast rose by 11 cm between 1960 and 2019, with an accelerating trend of 4.4 mm per year in the past two decades, exceeding both European and global averages.[108] Surface and groundwater droughts are becoming more frequent and severe, with eight of the ten driest years occurring after 2000.[109]

[105] PP14 Agricultural droughts
[106] KM21 Irrigation of agricultural land
[107] PP05 The Triglav glacier
[108] MR02 Sea level
[109] PP13 Hydrological droughts of groundwater

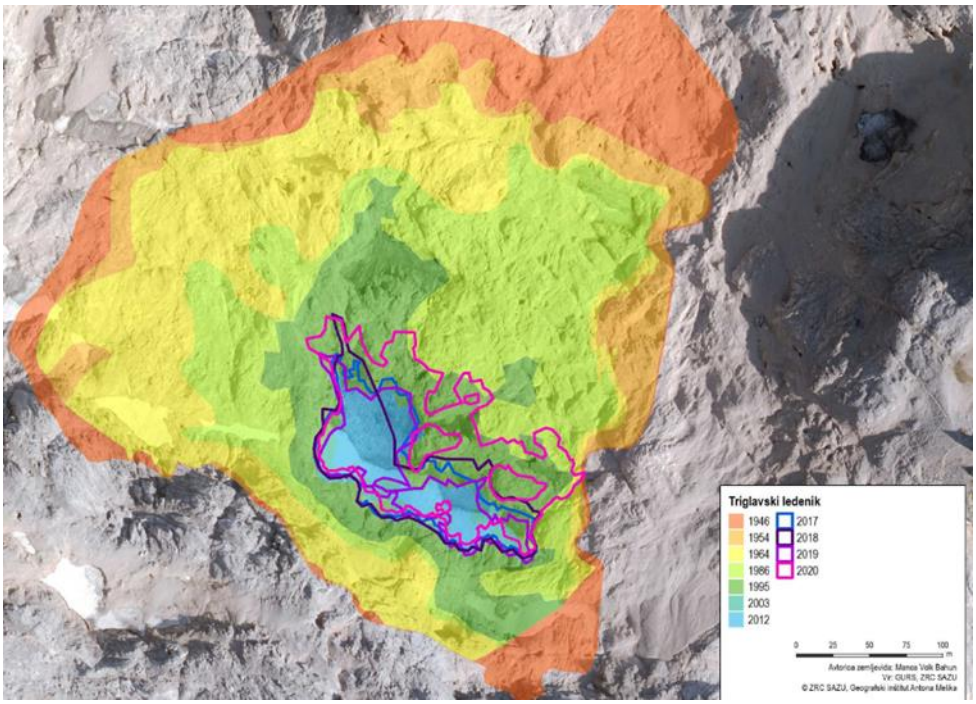


***Figure 38: Extent of the Triglav glacier, 1946-2020[110]***

Slovenia's forests, which cover 56% of the land area (58% including shrubland), are increasingly affected by climate-related stressors, including extreme weather events, droughts, and pest outbreaks (e.g., bark beetles). Since 2020, forest defoliation and damage have intensified, particularly impacting spruce, beech, oak, and black pine. These trends highlight the need for adaptive forest management, including species diversification, improved pest monitoring, and sustainable harvesting practices to ensure forests continue to provide ecosystem services such as carbon sequestration and biodiversity conservation.[111]

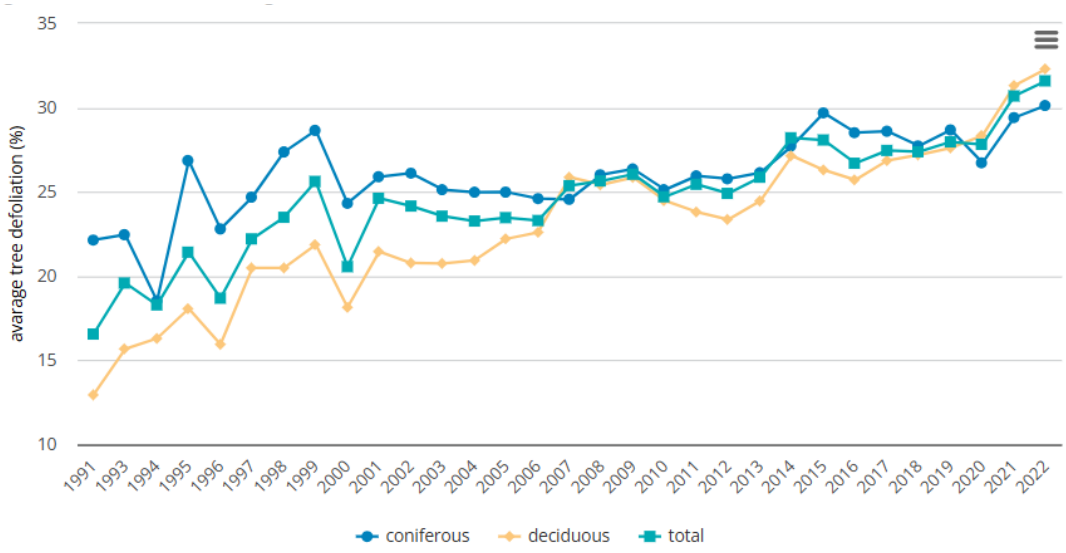


***Figure 39: Trend of average tree defoliation[112]***

[110] PP05 The Triglav glacier
[111] GZ01 Forest decline and tree defoliation
[112] GZ01 Forest decline and tree defoliation

Climate change is exacerbating social and health vulnerabilities, particularly for elderly population, low-income households, and those with pre-existing health conditions. The increasing intensity and frequency of heatwaves elevate risks for cardiovascular diseases, respiratory conditions, and mortality.[113] Extreme weather events are forcing residents to relocate from the most affected areas. Older households with low incomes are particularly vulnerable, as their homes are often not adapted to high temperatures.

Changing climatic conditions are also increasing the spread of tick-borne diseases. Between 2014 and 2023, Slovenia recorded between just under 3,000 and over 7,000 cases of Lyme borreliosis annually, with an average of 105 cases of tick-borne encephalitis per year. Climate change extends the active season of ticks and expands their habitat range, increasing the risk of infection. Raising awareness and promoting preventive measures are key strategies for reducing the burden of these diseases.[114]

Slovenia's tourism industry is facing increasing risks due to climate change. Reduced snowfall and rising temperatures negatively impact winter tourism, forcing ski resorts to rely on artificial snow production, which raises operational costs. Meanwhile, summer tourism is threatened by heatwaves, which reduce outdoor recreational opportunities and increase health risks, also for tourists.[115]

Slovenia is already implementing adaptation measures across multiple sectors. These include improving water resource management, expanding flood protection, enhancing food self-sufficiency, strengthening irrigation infrastructure, and promoting green infrastructure to mitigate urban heat island effects. The energy sector is focusing on increasing efficiency and expanding renewable energy sources to reduce climate-related risks.

However, long-term resilience requires further investments in energy security, sustainable agriculture, and infrastructure adaptation. Strengthening Slovenia's adaptive capacity will be crucial in minimizing climate change's negative impacts on the economy, society, and environment.

(c) Approaches, methodologies and tools, and associated uncertainties and challenges, in relation to paragraph 107(a) and (b) above

This is described below under section D.

## III.C. Adaptation priorities and barriers

108. Each Party should provide the following information, as appropriate:
(a) Domestic priorities and progress towards those priorities;
(b) Adaptation challenges and gaps, and barriers to adaptation.

Slovenia is committed to a comprehensive, strategic and long-term approach to climate change adaptation. The two main adaptation priorities are the adoption of the Climate Law and the development of a new national adaptation strategy. The Climate Law is currently awaiting consideration by the Government of the Republic of Slovenia, while MECE has only recently commenced work on the preparation of the new strategy. In 2025, sectoral climate vulnerability and risk assessments will be carried out for ten priority sectors: water management, nature conservation, cultural heritage preservation, agriculture, forestry, energy, infrastructure and buildings, public health, the economy, and settlements – cities and other urban areas. In 2026,

[113] ZD20 Heat waves and daily number of deaths
[114] ZD25 Reported cases of lyme borreliosis and tick-borne meningoencephalitis in Slovenia
[115] PP10 Extreme precipitation

this will be followed by the development of harmonised guidelines, the setting of objectives, and the establishment of performance indicators.

In connection with the preparation of the new national adaptation strategy, MECE will re-establish the inter-ministerial working group in 2025 to support its development and monitor its implementation. The working group will comprise representatives from all ten priority sectors, with additional sectors invited to participate if needed.

Strengthening the climate services provided by EARS is also essential in the context of preparing both the new national adaptation strategy and the regional adaptation action plans. EARS already provides climate services, including the analysis of past climate conditions, extreme events, and climate projections. Under the seven-year Strategic Integrated LIFE Project for Adaptation – LIFE4ADAPT, EARS will further strengthen its existing climate services through the formal establishment of the Centre for Climate Analysis and Projections. The Centre's primary function will be to provide user-focused climate data and products, in particular climate projections, tailored to the needs of individual sectors through sector-specific climate information, in support of climate change adaptation in Slovenia. It will offer users access to climate data in various formats — tables, maps, and graphs — via a dedicated online platform, with a focus on sector-specific customisation and user-friendly data presentation. The Centre will also deliver training for professionals from different sectors on the effective use of climate services.

Key barriers to climate change adaptation in Slovenia include limited institutional capacity, a lack of experience in conducting climate vulnerability and risk assessments, and an insufficient repository of good practice examples, particularly in the field of nature-based solutions.

Like other smaller countries, Slovenia faces a shortage of experts with formal training in climatology, as well as adaptation specialists with broad interdisciplinary knowledge. As demand for climate services continues to rise — and is expected to increase further due to the requirements of climate legislation (such as the preparation of sectoral and regional vulnerability and risk assessments, and the ongoing refinement of climate projections) — this constitutes a significant shortcoming. In parallel, ministries and local communities are also facing shortages of professional and technical staff, which contributes to slower integration of adaptation into strategic documents and the implementation of related measures.

## III.D. Adaptation strategies, policies, plans, goals and actions to integrate adaptation into national policies and strategies

109. Each Party should provide the following information, as appropriate:
(a) Implementation of adaptation actions in accordance with the global goal on adaptation as set out in Article 7, paragraph 1, of the Paris Agreement;
(b) Adaptation goals, actions, objectives, undertakings, efforts, plans (e.g. national adaptation plans and subnational plans), strategies, policies, priorities (e.g. priority sectors, priority regions or integrated plans for coastal management, water and agriculture), programmes and efforts to build resilience;
(c) How best available science, gender perspectives and indigenous, traditional and local knowledge are integrated into adaptation;
(d) Development priorities related to climate change adaptation and impacts;
(e) Any adaptation actions and/or economic diversification plans leading to mitigation co-benefits;
(f) Efforts to integrate climate change into development efforts, plans, policies and programming, including related capacity-building activities;
(g) Nature-based solutions to climate change adaptation;
(h) Stakeholder involvement, including subnational, community-level and private sector plans, priorities, actions and programmes.

It is no coincidence that Slovenia's first strategic document on adaptation — the Strategy for the Adaptation of Slovenian Agriculture and Forestry to Climate Change — was prepared for

agriculture and forestry sector. Agriculture is highly dependent on weather and climate conditions, as factors such as air and soil temperature, solar radiation, air humidity, the amount and distribution of precipitation, and the frequency and intensity of extreme weather events have a decisive impact on agricultural production. A similar situation applies to forests in Slovenia, which, with approximately 60% forest cover, ranks as the third most forested country in Europe. The role of forests and forestry in climate change adaptation and mitigation is multifaceted. The first aspect is “protective forest management”, which focuses on reducing $CO_2$ emissions to the atmosphere; the second is “carbon storage-oriented forest management”, aimed at increasing carbon stocks in vegetation and soils; and the third is “substitution-based forest management”, which promotes the replacement of non-renewable materials and fuels with wood.

The 2008 adaptation strategy is built around five core components, pillars or orientations:

- strengthening capacities for managing adaptation in agriculture and forestry;
- education, awareness-raising and advisory support;
- maintaining and developing new knowledge on climate change and adaptation;
- agricultural and forestry policy measures, including amendments to existing regulations;
- strengthening international cooperation and partnerships in the field of agricultural and forestry adaptation to climate change, particularly within the EU.

Each of the five pillars also contains examples of specific adaptation measures. Based on the 2008 adaptation strategy, the Ministry of Agriculture, Forestry and Food adopted an Action Plan for the Strategy for the Adaptation of Slovenian Agriculture and Forestry to Climate Change for 2010 and 2011. The plan included measures that were already being implemented under the five pillars of the 2008 strategy, supported through the Rural Development Programme of the Republic of Slovenia for the 2007–2013 period, as well as through the regular activities of institutions operating in the agricultural sector. It also included new measures intended for future implementation, which could serve as examples of actions to support agricultural adaptation. No further action plans were developed, although implementation of the measures included in the applicable rural development programme continued. Climate change has become one of the core objectives of the Common Agricultural Policy (CAP) for the 2014–2020 period, and this remains the case for the 2021–2027 programming period.

In 2016, the Government adopted the Strategic Framework for Climate Change Adaptation, based on a proposal by the then Ministry of the Environment and Spatial Planning. The overall objective of the 2016 Strategic Framework is to reduce Slovenia’s exposure, sensitivity and vulnerability to the impacts of climate change, while strengthening the resilience and adaptive capacity of society. The Strategic Framework does not define specific measures but outlines general directions and steps across four key areas:

- The impacts of climate change should be comprehensively integrated into the development and implementation of all policies, measures and activities — at national, regional and local levels, as well as by economic operators and individuals. Particular attention should be given to the consideration of climate change impacts in development and spatial planning.
- Broader cooperation, coordination, and the exchange of experience and good practices should be encouraged.
- Continuous efforts should be made to strengthen knowledge of climate change impacts and adaptation methods.
- An appropriate level and quality of education, training, awareness, information and broader communication on climate change impacts should be ensured. Target groups should be informed about the societal impacts of climate change.

The adoption of the Strategic Framework for Climate Change Adaptation 2016 was intended to be followed by the adoption of an action plan outlining sector-specific measures; however, this did not materialise.

A draft report on the implementation of the Strategic Framework during the 2016–2020 period indicated varying levels of success in delivering the actions envisaged in the strategy. Slovenia was most successful in the integration of climate change adaptation into strategic planning, in European and international activities, in the provision of climate services, and in the area of education. Activities related to the enhanced use of environmental impact assessment tools, inter-ministerial cooperation, the integration of data systems, and communication efforts were assessed as partially successful. A national contact point for coordination with regional and local levels was never established, nor were a climate portal, regular collaboration between researchers and policy makers, or the development of climate vulnerability and risk assessments. However, the share of financial resources allocated to adaptation increased.

In 2021, Slovenia adopted the Long-Term Climate Strategy of the Republic of Slovenia until 2050[116]. The strategy sets out that Slovenia will become a climate-neutral and climate-resilient society by 2050, grounded in the principles of sustainable development. It seeks to promote the efficient use of energy and natural resources, while maintaining a high level of competitiveness within a low-carbon, circular economy. The strategy outlines the path towards a society based on:

- preserved nature,
- circular economy,
- renewable and low-carbon energy sources,
- sustainable mobility, and
- locally produced, healthy food.
- It will be adapted to and resilient to the impacts of climate change.

Slovenia will become a society where the quality and safety of life are high, and which also takes advantage of opportunities arising from a changing climate. The transition to a climate-neutral society will be inclusive, grounded in the principles of climate justice, and the costs and benefits of the transition will be distributed fairly. Even the most vulnerable population groups will be supported in implementing both mitigation and adaptation measures. By 2050, Slovenia will reduce GHG emissions by 80–90% compared to 2005 levels, enhance carbon sinks, and at the same time accelerate the implementation of climate adaptation policies and ensure climate security for its population.

NECP serves as the implementation document for the long-term climate strategy. It defines Slovenia's energy and climate objectives, as well as the policies and measures to achieve them by 2030, and includes projections for a further ten-year period. In December 2024, the Government of the Republic of Slovenia adopted the updated NECP 2024 for the period up to 2030 (with a perspective to 2040). NECP 2024 also includes 13 adaptation measures, grouped into five thematic areas:

- Preparation of appropriate technical bases, data, and updated projections;
- Preparation of the national climate adaptation strategy and action plan;
- Establishment of a support office for adaptation and climate resilience at the local and regional levels;
- Urban climate change adaptation programme: addressing urban heat islands;
- Incentives for investments in fixed assets in agriculture that contribute to adaptation to the negative impacts of climate change and enhance the resilience of the agricultural sector.

[116] https://pisrs.si/pregledPredpisa?id=RESO131

As previously mentioned, a stronger commitment to and regulation of climate change adaptation will be systemically addressed through the forthcoming Climate Law. The draft Climate Law prescribes that a national adaptation strategy must be prepared at least once every ten years. The strategy must include guidance and objectives for ten priority sectors: water management, nature conservation, cultural heritage preservation, agriculture, forestry, energy, infrastructure and buildings, public health, the economy, and settlements – cities and other urban areas. All priority sectors participate in the preparation of the strategy and are also responsible for preparing sectoral climate vulnerability and risk assessments.

Regardless of the legal status of the Climate Law, MECE already began the process of preparing the new national adaptation strategy in 2024. In the initial phase, introductory meetings were held with all priority sectors and key stakeholders — including regions, local communities, NGOs, the Climate Council, and the Human Rights Ombudsman. During these meetings, participants were informed about the strategy development process and the expectations regarding risk ownership. For all priority sectors, MECE, in cooperation with EARS and the European Environment Agency, delivered expert training on climate change, along with workshops to support the preparation of sectoral climate vulnerability and risk assessments. In November 2024, all priority sectors also received detailed guidelines for preparing their respective assessments.

The climate vulnerability and risk assessment is a qualitative and/or quantitative scientific analysis, developed in accordance with the guidance of the Intergovernmental Panel on Climate Change (IPCC) and the terminology of the Fifth Assessment Report (AR5). The guidance also drew on the handbooks Do it yourself – Assessing climate change risks and vulnerabilities (Smithers and Dworak, 2023), Risk Supplement to the Vulnerability Sourcebook (GIZ and EURAC, 2017), and the most recent report of the European Environment Agency (EUCRA, 2023), which assesses climate risks in Europe.

The sectoral assessments follow a six-step process:

1. Preparation of the baseline (selection of hazards and risks);
2. Assessment of climate vulnerability;
3. Definition of climate change scenarios;
4. Assessment of exposure and potential climate-related impacts;
5. Assessment of climate risks (and opportunities);
6. Communication of uncertainties.

It is advisable that the preparation of the report be carried out within a broader professional community, using a participatory approach — for example, in the form of workshops. The assessment is based on matrix evaluation, supported by indicators, and is fundamentally quantitative in nature. Indicators are drawn from existing databases, such as SI-STAT, the Spatial Information System, Environmental Indicators, the NARCIS system, and other relevant sources. Where appropriate, additional indicators may be developed using GIS or other analytical tools. It is desirable that the relevant data be monitored on an ongoing basis, as the assessments are updated every five years. It is also recommended that all indicators be quantified and subsequently scored on a five-point scale, since the underlying data are measured using different units — for example, temperature in °C and precipitation in mm.

As a first step, sectors identify the relevant hazards and assess the corresponding hazard indicators. A hazard is not necessarily an extreme weather event (e.g. a storm); it may also be a slow-onset trend (e.g. reduced water availability due to snowmelt, sea level rise, etc.). Consideration should also be given to potential future risks or hazards. A pre-defined list of hazards has been prepared to support the sectors in this process. Based on the first step, each sector identifies three to five climate risks relevant to its domain. A single hazard may give rise to multiple risks, or a single risk may result from several hazards.

In the second step, sectors determine vulnerability, which is assessed through an evaluation of both sensitivity and adaptive capacity. It is important to consider both direct and indirect dimensions of sensitivity. Future climate risks will depend not only on future climate conditions, but also on evolving socio-economic circumstances. This step also involves identifying social groups particularly vulnerable to the impacts of climate change. These include older people, children, individuals with health conditions (in particular, those with cardiovascular or respiratory diseases), and people experiencing socio-economic hardship — such as poverty or inadequate housing. Also considered more vulnerable are individuals whose place of residence exposes them more directly to climate hazards — for example, those living in floodplains. Attention should also be paid to specific social groups whose vulnerability is linked to particular hazards. For instance, heatwaves are more likely to affect older adults and outdoor manual workers.

In the third step, sectors examine climate change scenarios to assess the extent to which climate hazards are projected to evolve in the future. Sectors are expected to use the Representative Concentration Pathway (RCP) scenarios, for which EARS has already prepared climate projections. To appropriately account for uncertainty, it is important to apply more than one climate change scenario — the RCP4.5 scenario for the mid-century period (2041–2070), and both the RCP4.5 and RCP8.5 scenarios for the end-of-century period (2071–2100), using the reference period 1981–2010 for comparison.

The fourth step involves the assessment of exposure to climate hazards for each scenario and time horizon. Sectors assess exposure based on current conditions and three future scenarios.

The combination of vulnerability and exposure assessments results in an estimate of potential climate-related impacts. In the fifth step, sectors assess the likelihood of each potential impact. According to the IPCC (O'Neill et al., 2022), major risks are typically characterised by:

- significant consequences, both in the present and the future;
- a high likelihood of severe outcomes;
- a high degree of irreversibility (so-called tipping points);
- strong potential for cascading effects (geographically or across sectors/systems);
- a compounding or amplifying effect over time.

The instructions also outline a sixth step – communication of uncertainty. When interpreting results, it is essential that sectors consider and clearly communicate — both in the report and in any presentations — the uncertainties associated with the data used to determine sensitivity, adaptive capacity, and exposure to hazards, the estimated likelihood of climate-related impacts, and the temporal and spatial distribution of climate risks and opportunities.

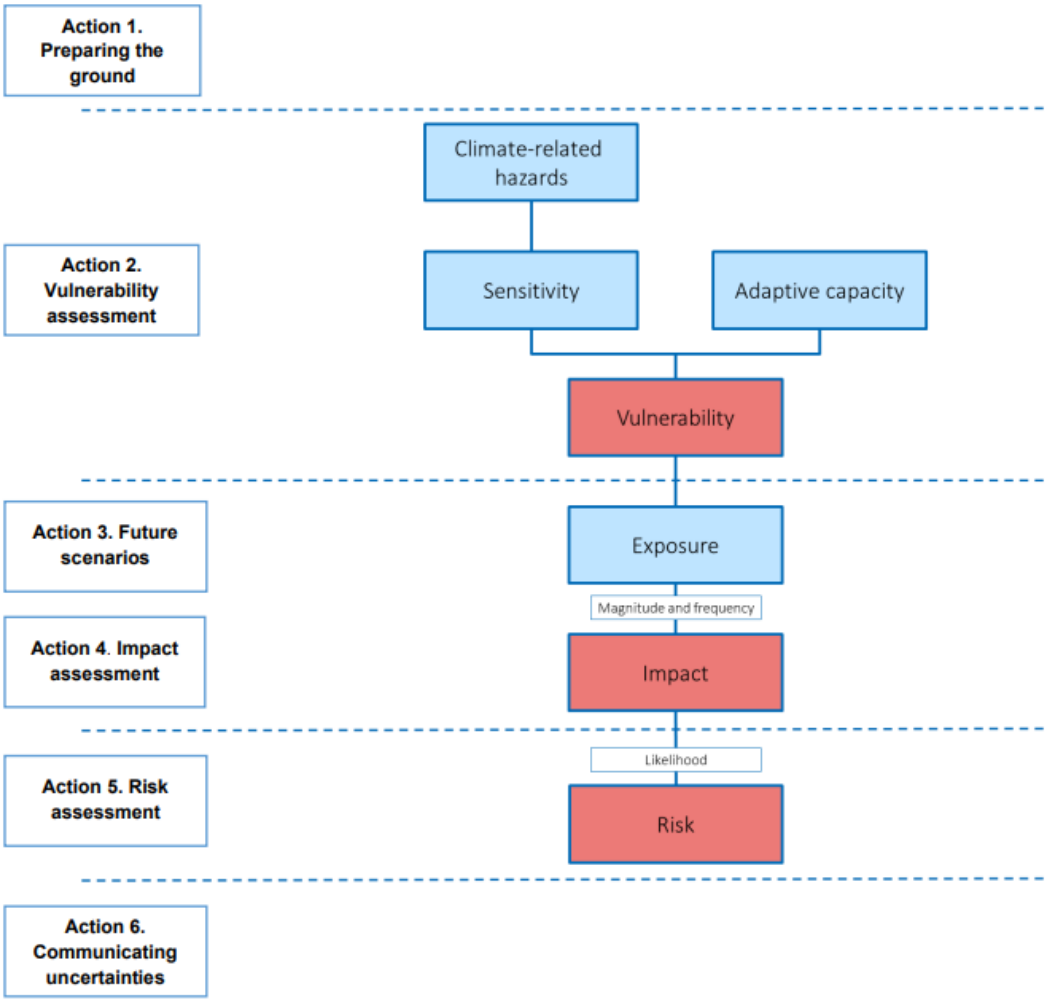


***Figure 40: Schematic representation of the sequence of steps in conducting a vulnerability and risk assessment (Smithers and Dworak, 2023)***

EARS is also closely involved in the preparation of vulnerability and risk assessments, providing both data and climate projections. The preparation of sectoral climate vulnerability and risk assessments, to be completed in 2025, will be followed by a broader public consultation on the formulation of adaptation priorities and objectives in 2026.

Once the national adaptation strategy is adopted, it will be followed by the preparation and adoption of 12 regional climate adaptation action plans, which will support the identification of necessary investments and other measures to strengthen the resilience of individual regions. In cooperation with the Ministry of Cohesion and Regional Development, MECE has commissioned a two-year targeted research project entitled Vulnerability to Climate Change and Adaptation in Development Regions. Currently, the baseline conditions of Slovenia's development regions with regard to climate change — which are essential for designing appropriate adaptation measures — are neither well known nor systematically defined. The project addresses the following key questions:

1. What are — and what will be — the region-specific impacts of climate change?

2. Which sectors are — and will be — most affected by the identified climate change impacts in each region (i.e. the definition of climate risks and vulnerabilities for each Slovenian development region)?

3. What is the level of awareness and knowledge on climate change adaptation among regional development actors (regional development agencies, members of regional

development councils and regional councils, selected regional committees) and local development actors (mayors, municipal administrations)?

Climate change adaptation is increasingly being incorporated into sectoral policy documents. For example, the Ministry of Natural Resources and Spatial Planning has prepared a draft Implementation Plan for the Spatial Development Strategy of Slovenia. The plan sets out a series of activities derived from the strategy's long-term objectives and priority areas. One of the strategy's priorities is to strengthen the resilience of settlements to climate change. Climate change, its impacts, and the need for adaptation represent key challenges for both spatial planning and the implementation of activities within the built environment. Implementing the proposed activities will enhance the resilience of settlements to climate change, support the preservation of cultural heritage, and improve their overall attractiveness and quality of life. The Implementation Plan addresses a range of issues, including stormwater management, the provision of adequate, connected and high-quality green spaces, the mitigation of urban heat islands, and other related topics. It also outlines a set of actions aimed at enhancing the safety of settlements from climate-related hazards and ensuring the supply of drinking water. The preparation of analyses, the development of regulations, guidelines, recommendations, and design standards for buildings and spatial planning — together with related training — will contribute to the sustainable use of natural resources and to the strengthening of climate resilience. Particular emphasis is placed on improving the modelling of flood-prone, erosion-prone, and landslide-prone areas, which form the basis for coherent and effective spatial planning, as well as for improved management and the sustainable use of water resources.

The Ministry of Natural Resources and Spatial Planning has prepared a draft Decree on the Conditions and Restrictions for Land Use and Activities in Areas at Risk of Flooding and Related Erosion from Inland and Coastal Waters (the so-called Flood Decree), together with the document Preliminary Flood Risk Assessment of the Republic of Slovenia 2024 and an updated proposal — or set — of areas of significant flood risk. A technical review commission has also been established to verify the compliance of flood maps with applicable regulations and to conduct expert reviews, oversight, and formal validation of flood hazard maps and their classification, in cases where the map developers do not accept the comments of external reviewers.

## III.E. Progress on implementation of adaptation

110. Each Party should provide the following information, as appropriate, on progress on:
(a) Implementation of the actions identified in chapter IV.D above;
(b) Steps taken to formulate, implement, publish and update national and regional programmes, strategies and measures, policy frameworks (e.g. national adaptation plans) and other relevant information;
(c) Implementation of adaptation actions identified in current and past adaptation communications, including efforts towards meeting adaptation needs, as appropriate;
(d) Implementation of adaptation actions identified in the adaptation component of NDCs, as applicable;
(e) Coordination activities and changes in regulations, policies and planning.
111. Developing country Parties may also include information on, as appropriate, implementation of supported adaptation actions, and the effectiveness of already implemented adaptation measures.

To finance climate change mitigation and adaptation measures, Slovenia has established the Climate Change Fund. The use of the Fund's resources is set out in the Ordinance on the Climate Change Funding Programme, with the current decree covering the 2023–2026 period. In 2022, the Climate Change Fund held just over EUR 182 million in total resources, of which EUR 23 million was allocated to adaptation. In 2023, the Fund's total resources amounted to approximately EUR 154 million, with EUR 19 million designated for adaptation measures. The

Fund is administered by MECE, which, under the current programme, has earmarked up to EUR 270 million for adaptation to climate change.[117]

In May 2024, the Government of the Republic of Slovenia adopted a five-year recovery programme worth EUR 2.33 billion, of which more than half — EUR 1.36 billion — is allocated to the rehabilitation of watercourses and water infrastructure damaged by the 2023 floods. The rehabilitation works aim to restore riverbeds and banks to a functional condition, taking into account climate change and applying nature-based solutions wherever appropriate and feasible. The purpose of the programme is to provide more resilient solutions, reduce the damage from future extreme events, and protect biodiversity in and around watercourses.

In the area of wildfire risk reduction, the Ministry of Agriculture, Forestry and Food allocated EUR 2.8 million in non-repayable funding under the Rural Development Programme of the Republic of Slovenia 2014–2020, enabling 100% financing of eligible project costs related to wildfire prevention. A number of measures have already been implemented, including the construction of 2.4 km of forest fire roads, 1.6 km of fire-break paths, and the installation of four hydrants. Despite these achievements, further action is still required. Several new projects are currently under way, including the construction of 1.2 km of forest fire roads, 40.4 km of fire-break paths, four helicopter landing areas for emergency response outside airports, and 31 hydrants. In addition, 12.5 km of fire-break paths will be reconstructed, and 30.5 km will be maintained as part of ongoing fire prevention efforts.

To support regions and municipalities in strengthening long-term climate resilience, MECE, in cooperation with the Association of Municipalities and Towns of Slovenia, established the Climate Office in autumn 2024. A key objective of this public–public partnership is to build the capacity of municipal administrations, which — through the support of the Climate Office — will be better equipped to plan adaptation measures such as directing settlement development away from hazard-prone areas and improving the resilience of infrastructure to floods, heatwaves, and other extreme weather events. The project will also provide municipalities with up-to-date information on national and EU adaptation support instruments, thereby improving their preparedness to implement measures at the local level.

In parallel with the adoption of the Climate Law and the development of the new national adaptation strategy, Slovenia is launching the ambitious, seven-year Strategic Integrated LIFE Project for Adaptation — LIFE4ADAPT. Valued at EUR 26.6 million — of which EUR 14.2 million is co-financed by the European Union — the project aims to develop effective solutions for adapting to increasingly frequent extreme weather events and long-term environmental change. Over the course of the project, partners will work closely with key stakeholders, including municipalities, regions, the private sector, and civil society. The project also aims to strengthen inter-ministerial coordination to ensure policy coherence across the field of adaptation, including through meetings of technical working groups and high-level representatives of national and local authorities.

Among the project's key outcomes is the establishment of a national centre for climate analysis and projections at the Slovenian Environment Agency. The Centre will provide up-to-date data and guidance to support climate change adaptation at municipal, regional, and sectoral levels.

The project consortium will also implement 14 pilot projects, which will serve as demonstrative examples of good practice for broader replication across Slovenia. These projects will contribute to biodiversity conservation, risk reduction related to climate extremes, and improved quality of life in local communities.

As part of the project, the University of Ljubljana will develop and deliver training programmes for teachers, students, experts, practitioners in the most affected sectors, and public

[117] These funds support the implementation of measures carried out through projects such as Biodiversity Conservation, Co-financing of Programmes in the Field of Natural Disasters, LIFE ViVACCAdapt, LIFE Amphicon, and Monitoring of Vector-Borne Disease Carriers.

administration staff. The focus will be on building the capacities of educators and decision-makers, and on applying knowledge in practice.

Through LIFE4ADAPT, Slovenia will also establish a comprehensive national climate portal, which will include, in addition to climate change mitigation content, tools and resources to support adaptation. The Samo1planet portal will thus become the central national hub for knowledge, tools, and the exchange of good practices in the field of climate resilience.

## III.F. Monitoring and evaluation of adaptation actions and processes

112. In order to enhance their adaptation actions and to facilitate reporting, as appropriate, each Party should report on the establishment or use of domestic systems to monitor and evaluate the implementation of adaptation actions. Parties should report on approaches and systems for monitoring and evaluation, including those in place or under development.
113. Each Party should provide the following information, as appropriate, related to monitoring and evaluation:
(a) Achievements, impacts, resilience, review, effectiveness and results;
(b) Approaches and systems used, and their outputs;
(c) Assessment of and indicators for: (i) How adaptation increased resilience and reduced impacts; (ii) When adaptation is not sufficient to avert impacts; (iii) How effective implemented adaptation measures are;
(d) Implementation, in particular on: (i) Transparency of planning and implementation; (ii) How support programmes meet specific vulnerabilities and adaptation needs; (iii) How adaptation actions influence other development goals; (iv) Good practices, experience and lessons learned from policy and regulatory changes, actions and coordination mechanisms.
114. Each Party should provide information related to the effectiveness and sustainability of adaptation actions, as appropriate, including on:
(a) Ownership, stakeholder engagement, alignment of adaptation actions with national and subnational policies, and replicability;
(b) The results of adaptation actions and the sustainability of those results.

Slovenia has not yet established domestic systems to monitor and evaluate the implementation of adaptation actions. MECE already began the process of preparing the new national adaptation strategy in 2024. In 2025, sectoral assessments of climate vulnerability and risks will be carried out for ten priority sectors: water management, nature conservation, cultural heritage preservation, agriculture, forestry, energy, infrastructure and buildings, public health, the economy, and settlements – cities and other urban areas. In 2026, this will be followed by the development of harmonised guidance, the setting of objectives, and the establishment of performance indicators.

## III.G. Information related to averting, minimizing and addressing loss and damage associated with climate change impacts

115. Each interested Party may provide, as appropriate, information related to enhancing understanding, action and support, on a cooperative and facilitative basis, to avert, minimize and address loss and damage associated with climate change impacts, taking into account projected changes in climate-related risks, vulnerabilities, adaptive capacities and exposure, including, as appropriate, on:
(a) Observed and potential climate change impacts, including those related to extreme weather events and slow onset events, drawing upon the best available science;
(b) Activities related to averting, minimizing and addressing loss and damage associated with the adverse effects of climate change;
(c) Institutional arrangements to facilitate the implementation of the activities referred to in paragraph 115(b) above.

Climate projections indicate that Southern Europe — including Slovenia — will be more severely affected by climate change than other parts of the continent. According to the European Environment Agency, the economic damage caused by weather and climate-related events in Slovenia between 1980 and 2023 totalled EUR 17.5 billion. When calculated on a per capita basis, Slovenia ranks first among EU Member States. The differences between countries are considerable: Slovenia – EUR 8,700 per capita; second-ranked Luxembourg – EUR 2,700 per capita.

A study by the Insurance Supervision Agency on the property insurance gap revealed that the shortfall is substantial. In the case of floods, the insurance gap is estimated at around 70%, meaning that only 30% of properties are adequately insured. The situation is even more critical in relation to earthquakes, where the insurance gap is estimated at between 80% and 85%. In 2024, a Working Group on Bridging the Household Insurance Gap was established. Its primary objective is to identify the most suitable measures for the Slovenian context to help reduce the gap in household insurance coverage.

MECE, in cooperation with the Ministry of the Economy, Tourism and Sport (METS), submitted a research project proposal under a call launched by the Slovenian Research and Innovation Agency, focusing on improving insurance accessibility for micro, small and medium-sized enterprises (MSMEs). Existing insurance products often fail to meet the specific needs of MSMEs or are unaffordable due to high premiums. As a result, many such businesses either remain uninsured or opt for tailored packages which, while more affordable, offer only limited compensation in the event of damage — often restricted to a fixed amount — and do not provide sufficient coverage in the case of more severe losses. The objective of the project is to develop an optimal hybrid insurance model that would combine public support with private insurance products, thereby enhancing insurance coverage among micro, small and medium-sized enterprises.

## III.H. Cooperation, good practices, experience and lessons learned

116. Each Party should provide the following information, as appropriate, related to cooperation, good practices, experience and lessons learned:
(a) Efforts to share information, good practices, experience and lessons learned, including as they relate to: (i) Science, planning and policies relevant to adaptation; (ii) Policy innovation and pilot and demonstration projects; (iii) Integration of adaptation actions into planning at different levels; (iv) Cooperation to share information and to strengthen science, institutions and adaptation; (v) Area, scale and types of cooperation and good practices; (vi) Improving durability and effectiveness of adaptation actions; (vii) Helping developing countries to identify effective adaptation practices, needs, priorities, and challenges and gaps in a way that is consistent with encouraging good practices;
(b) Strengthening scientific research and knowledge related to: (i) Climate, including research and systematic observation and early warning systems, to inform climate services and decision-making; (ii) Vulnerability and adaptation; (iii) Monitoring and evaluation.

Climate change has become one of the most significant threats to the future, particularly in South-Eastern Europe, which is warming at twice the global average. To strengthen the region's resilience and develop specific responses, Slovenia hosted the High-Level Conference on the Challenges of Climate Change in South-Eastern Europe in February 2025, organised by MECE and EARS. The conference marked the first occasion on which environment ministers and heads of hydro meteorological services from across South-Eastern Europe convened alongside representatives of international organisations to exchange good practices in climate adaptation and enhance regional cooperation. During the discussions, participants focused on three key areas of adaptation: the role of meteorological and hydrological services in monitoring and forecasting climate change and providing early warnings of extreme weather events; regional cooperation without borders in the field of adaptation; and the development of national climate adaptation strategies. Through this

conference, Slovenia has positioned itself not only as an observer but as an active contributor to the design and coordination of adaptation processes in the region.

In 2024, the Ministry of Agriculture, Forestry and Food established a dedicated Department for Climate Policy and the Agricultural Knowledge and Innovation System. With the creation of this department, the Ministry is placing increased emphasis on both climate mitigation and adaptation, while at the same time reinforcing the national agricultural knowledge and innovation system. The Department monitors developments and contributes to the design of systemic solutions in the field of agricultural mitigation and adaptation — including energy use in agriculture, water management, the integration of nature-based solutions, and the development of synergies with biodiversity, carbon farming, the circular economy, and the bioeconomy. The Ministry is also active in the transformation towards sustainable food systems, with a focus on food security and food selfsufficiency. It contributes to the integration of digitalisation and robotics in agriculture from a climate perspective, and is involved in developing systemic approaches for accounting GHG emissions resulting from activities related to LULUCF and agricultural production, along with other climate-related activities in the agricultural sector.

Climate change represents an increasing threat to public health, as it contributes to more frequent and intense heatwaves, exacerbates air pollution, and is associated with increased mortality rates. It also promotes the spread of infectious diseases caused by pathogens, as higher temperatures create more favourable conditions for their transmission and development. Increased exposure to ultraviolet (UV) radiation further raises the risk of all forms of skin cancer. The health burden associated with climate change continues to grow each year, and it weighs most heavily on older adults, people with chronic conditions, pregnant women, children, and other particularly vulnerable population groups. In June 2024, the Ministry of Health and MECE, together with their partners — the National Institute of Public Health, the Institute for Health and the Environment, and the Jožef Stefan Institute — organised the first national conference entitled “Healthcare on the Green Path”. Slovenian and international experts exchanged views on possible solutions for the decarbonisation of the healthcare system, and shared examples of good practices from both Slovenia and abroad.

## III.I. Any other information related to climate change impacts and adaptation under Article 7 of the Paris Agreement

117. Each Party may provide, as appropriate, any other information related to climate change impacts and adaptation under Article 7.

Not available.

# IV. Information on financial, technology development and transfer and capacity-building support provided and mobilized under Articles 9–11 of the Paris Agreement

118. Developed country Parties shall provide information pursuant to Article 13, paragraph 9, of the Paris Agreement in accordance with the modalities, procedures, and guidelines (MPGs) contained in this chapter. Other Parties that provide support should provide such information and, in doing so, are encouraged to use the MPGs contained in this chapter.

## IV.A. National circumstances and institutional arrangements

Slovenia is not listed among the countries in Annex II of the UNFCCC and is therefore not obligated to provide financial or technical support to economies in transition or developing countries in their efforts to mitigate and adapt to climate change, as set out in Articles 4.3, 4.4, and 4.5 of the Convention. Nevertheless, Slovenia has voluntarily chosen to contribute voluntarily to climate finance. The Slovenian government remains committed to addressing global climate challenges, with particular emphasis on supporting the most vulnerable countries, including the least developed countries, as well as countries in its neighbourhood.

119. Information on national circumstances and institutional arrangements relevant to reporting on the provision and mobilization of support, including:
(a) Description of the systems and processes used to identify, track and report on support provided and mobilized through public interventions;

Financial, technology development and transfer and capacity-building support under Articles 9-11 of the Paris Agreement are part of international development cooperation, underpinned by the International Development Cooperation and Humanitarian Aid of the Republic of Slovenia Act, and the Decree on the implementation of the international development cooperation and humanitarian aid of the Republic of Slovenia (hereinafter: the Decree). The primary strategic documents guiding the provision of bilateral support to developing countries are the Resolution on the International Development Cooperation and Humanitarian Aid of the Republic of Slovenia (ReMRSHP, 2017118) (hereinafter: the Resolution) and, at the operational level, the Development Cooperation and Humanitarian Aid Strategy of the Republic of Slovenia until 2030[119] (hereinafter: the Strategy). Together, these documents define the goals, orientations, and principles of Slovenia's international development cooperation and humanitarian aid, along with thematic and geographical priorities, quantifiable target indicators for 2030, and the organisational framework, including the key institutions authorised to oversee development cooperation in the country. Climate finance plays a significant role in the Strategy. As outlined in the Strategy, climate change mitigation and adaptation ("support for activities to reduce GHG emissions and enhance climate resilience in partner countries") is one of the four primary thematic priorities of Slovenia's development cooperation. Another priority area that also incorporates climate finance is the sustainable management of natural resources and the promotion of a circular economy. Furthermore, environmental protection, alongside gender equality, is one of the two cross-cutting themes in Slovenia's development cooperation. Since 2024, the Guidelines for Integrating Environmental Protection into International Development Cooperation and Humanitarian Aid of the Republic of Slovenia have been in effect, ensuring the systematic integration of environmental protection into the needs analysis, planning, selection, implementation, monitoring, and evaluation of Slovenia’s international development cooperation and humanitarian aid activities. Projects that demonstrate a clear positive impact

[118] https://pisrs.si/pregledPredpisa?id=RESO117.
[119] https://www.gov.si/teme/nacrtovanje-in-izvajanje-mednarodnega-razvojnega-sodelovanja-in-humanitarne-pomoci-slovenije/

on the environment will receive additional points during the project selection phase. Furthermore, from 2025 onwards, an Environmental Impact Assessment will be a mandatory annex to the content plan of project proposals in international development cooperation.

The National Coordinator for International Development Cooperation and Official Development Assistance (ODA), which includes bilateral climate finance, is MFEA. Other government bodies involved in climate finance include MECE, MF, and METS. Among these, MECE is the only body providing multilateral climate finance. The project caretakers at each responsible public entity are entrusted with the monitoring of the project implementation and reporting to the MFEA, which then consolidates the data. To track ODA projects and report on them, Slovenia relies on the Creditor Reporting System (CRS)[120] of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD). OECD DAC Rio markers[121] are used to differentiate between climate change mitigation and adaptation impacts, as well as other reporting categories such as date of the commitment, amount committed for the whole project duration, amount disbursed in individual calendar year, name of co-financing entities, sector, potential involvement of technology transfer or capacity building, etc. Finally, specifically for private finance mobilisation, grants are recorded in the full amount, but only from the commercial entities.

(b) Description of challenges and limitations;

One of the key challenges Slovenia faces in the context of reporting on the provision and mobilisation of support is monitoring, measuring and reporting on technology development and transfer and capacity-building support. While there are established methodologies for reporting on various project components, such as channels, types of support, and sectors, current reporting systems like the OECD DAC's CRS database do not facilitate the systematic tracking of impacts related to capacity building and technology development and transfer. In the absence of such systems, the information presented in this report is based on a qualitative assessment. Furthermore, Slovenia does not monitor or measure technology development and transfer at the level of detail this report calls for; information on the technology cycle, endogenous technology development, efforts to encourage innovation and collaborative approaches to research and development, and knowledge generated are thus estimated at best. A similar issue arises in monitoring and measuring support for capacity-building.

(c) Information on experience and good practices in relation to public policy and regulatory frameworks to incentivize further private climate financing and investment;

The need for stronger mobilisation of private climate finance and investment has been recognised, with several discussions taking place between governmental and non-governmental institutions, as well as within them, aimed at multiplying existing efforts and identifying additional innovative financial sources for climate finance. The Strategy outlines specific activities for the national coordinator (MFEA) to increase private sector engagement, although these activities primarily focus on project implementation, technology transfer, and capacity-building, with less emphasis on the mobilisation of private finance. MFEA will strive to enhance the involvement of the private sector in international development cooperation also by organising thematic events, raising public awareness on this issue, and facilitating discussions at the level of political decision-makers.

[120] Converged Statistical Reporting Directives for CRS and the Annual DAC Questionnaire (2024). Available at: https://one.oecd.org/document/DCD/DAC(2024)40/FINAL/en/pdf

[121] DAC Working Party on Development Finance Statistics: Converged Statistical Reporting Directives for the Creditor Reporting System (CRS) and the Annual DAC Questionnaire (2023: p.61)

(d) Efforts taken to enhance comparability and accuracy of information reported on financial support provided and mobilized through public interventions, such as through use of international standards or harmonization with other countries, institutions and international systems.

To ensure consistency and continuity in our reporting, the information is aligned with and expands upon Slovenia's climate finance report to the European Commission, as set out in Article 19 of the Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action and in the formats laid down in Implementing Regulation (EU) 2020/1208. This also ensures coherence in reporting with other EU Member States.

120. Information, if available, on national circumstances and institutional arrangements for the provision of technology development and transfer and capacity-building support.

Both cooperation modalities are recognised in the Strategy. In the thematic priority area related to SDG 13 of the United Nations Sustainable Development Goals — Take urgent action to combat climate change and its impacts — the Strategy defines the following goal for international development cooperation: "Being part of the developed world, Slovenia will follow the principle of common but differentiated responsibility and respective capabilities to contribute adequate funds for international climate action aimed at reducing GHG emissions and adapting to climate change in partner countries, including the transfer of relevant technologies and the strengthening of administrative capacity in this area. To this end, Slovenia will also use the funds of the Climate Change Fund of the Republic of Slovenia to support the implementation of climate action in partner countries." (p. 15.) Technology transfer also features in the thematic priority area Sustainable and Inclusive Economic Growth ("Slovenia will transfer best practices, skills and technology of its development partners on the basis of the usefulness of projects for the sustainable development of a partner country." p.14).

Both forms of support also have corresponding criteria used in the project selection phase.

## IV.B. Underlying assumptions, definitions and methodologies

**Description of underlying assumptions, definitions and methodologies**

| Paragraph 125 of MPGs (18.CMA/1) | Description |
|---|---|
| (a) The chosen reporting year (calendar year, fiscal year) | Reporting is based on calendar years. |
| (b) The conversion between domestic currency and United States dollars | Official OECD DAC EUR-USD exchange rates for the relevant reporting year are used. |
| (c) The status (committed, disbursed) | Slovenia collects both, but typically provides and communicates data on amounts extended (disbursed) in the relevant calendar year. |
| (d) The channel (bilateral, regional, multi-bilateral, multilateral) | The channel is defined using the agreed OECD DAC methodology.[122] |
| (e) The funding source (official development assistance (ODA), other official flows (OOF), other). | The sources of funding are defined using the agreed OECD DAC methodology. |
| (f) The financial instrument (e.g. grant, concessional loan, non-concessional loan, equity, guarantee, insurance, other (specify)); | The financial instrument is identified using the agreed OECD DAC methodology. All support provided and mobilised in the 2021-22 period was in the form of grants. |

[122] Converged Statistical Reporting Directives for CRS and the Annual DAC Questionnaire (2024). Available at: https://one.oecd.org/document/DCD/DAC(2024)40/FINAL/en/pdf.

| | |
|---|---|
| (g) Information on instruments and funding sources reported, including how a Party has determined finance to be concessional and/or ODA, including by using information such as grant equivalency, institution and/or instrument-based approaches; | Information on instruments and funding sources reported is identified using the agreed OECD DAC methodology. |
| (h) The type of support (e.g. adaptation, mitigation, cross-cutting); | The type of support is defined using OECD DAC Rio markers[123]: a project with a Rio marker for mitigation of 1 or higher and an adaptation marker of 0 is defined as supporting mitigation; a project with a Rio marker for mitigation of 0 and an adaptation marker of 1 or higher is defined as supporting adaptation; a project with both the Rio marker for mitigation and the adaptation marker being 1 or higher is defined as cross-cutting. |
| (i) The sector; | The sector refers to the specific area of the recipient's economic or social structure that the financial support is intended to contribute to developing. Similar to the EU as a whole, Slovenia uses a slightly reduced version of the DAC CRS codes, with Code 313 'Fishing' moved under Code 311 'Agriculture', Codes 322 'Mineral resources and mining' and 323 'Construction' moved under 321 'Industry', and Code 410 'General environmental protection' moved to 'Cross-cutting'. Slovenia thus reports on the following eight sectors: Energy, Water and sanitation, Transport, Industry, Agriculture, Forestry, Cross-cutting and Other. |
| (j) The subsector; | The OECD-DAC CRS five-digit purpose codes are used when reporting sub-sectoral information. |
| (k) Whether it supported capacity-building and/or technology development and transfer objectives | This is a subjective assessment based on definitions of capacity-building and technology transfer, as presented under point 122 below. |
| (l) The support as being climate-specific | For bilateral projects, if at least one of the OECD DAC Rio markers for mitigation or adaptation has a value of 1 or higher.<br><br>For multilateral projects, Slovenia uses the assigned share of basic contributions to multilateral organisations (International Development Association (IDA), International Bank for Reconstruction and Development (IBRD), FAO, GEF, etc.), as reported by OECD DAC. |

| |
|---|
| (m) Information on the efforts taken to avoid double counting, including on:<br>(i) How double counting among multiple Parties involved in the provision of support was avoided;<br>(ii) How double counting among multiple Parties involved in the mobilization of private finance through public interventions was avoided, including the methodologies and assumptions used to attribute the mobilized resources through public interventions reported to the Party that reports them, if possible relative to the type of instrument used for the mobilization;<br>(iii) How double counting was avoided between the resources reported as provided or mobilized, and the resources used under Article 6 of the Paris Agreement by the acquiring Party for use towards the achievement of its NDC; |

[123] DAC Working Party on Development Finance Statistics: Converged Statistical Reporting Directives for CRS and the Annual DAC Questionnaire (2023: p. 61).

(iv) How support is attributed between multiple recipient countries, in cases where a project involves multiple recipient countries and where this information is reported on a country-by-country basis;

To avoid double counting, Slovenia seeks to implement the following measures:

- For bilateral projects, only funding sources from Slovenia are included;
- Projects involving multiple recipient countries are treated as a single project and accounted for and reported only once;
- For multilateral projects, climate finance is reported as soon as the payment is made to the international organisation, not when the organisation makes subsequent payments for individual projects;
- Slovenia does not use any mechanisms relevant to Article 6 of the Paris Agreement.

(n) The definition of public and private finance, in particular where entities or funds are mixed; (o) How private finance was assessed as mobilized through public interventions, including by: (i) Identifying a clear causal link between a public intervention and mobilized private finance, where the activity would not have moved forward, or moved forward at scale, in the absence of the Party's intervention; (ii) Providing information on the point of measurement (e.g. point of commitment, point of disbursement) of the private finance mobilized as a result of the public intervention, to the extent possible in relation to the type of instrument or mechanism used for the mobilization; (iii) Providing information on the boundaries used to identify finance as mobilized by public intervention;

The definitions of private and public finance are used as per the OECD DAC methodology. Information is provided at the point of commitment (signature of the contract setting the commercial co-financing amount). Only commercial finance has been reported as "private finance mobilized". Own funds of non-governmental organisations (as lead or subcontractors) invested in the project have not been included in this framework. Private (commercial) funds can be provided in-cash or in-kind as expertise or time invested in the project, or as material/services/equipment.

(p) How it seeks to ensure that support provided and mobilized through public interventions effectively addresses the needs and priorities of developing country Parties for the implementation of the Paris Agreement, as identified in country-driven strategies and instruments, such as biennial transparency reports, NDCs and national adaptation plans;

Ownership is one of the core principles of development cooperation effectiveness, embedded at the heart of our development activities. From the outset, when assessing and determining the priority list of projects, alignment with the needs of the partner country, region, or local community (supported by appropriate documentation as evidence) is regarded not only as a criterion but also as a prerequisite for selection. The project implementer is required to include at least one local organisation from the partner country in the project proposal. Throughout the process of refining the project proposal, and during the implementation and monitoring phases, Slovenia consistently strives for an open dialogue with the recipients, which facilitates the most effective results and ensures the efficient use of resources.

(q) How it seeks to ensure that support provided and mobilized through public interventions is in line with the long-term goals of the Paris Agreement;

Slovenia has been guided by definitions, recommendation and other policies from multilateral organizations, such as the European Union, United Nations and its agencies, as well as the OECD DAC.

(r) An indication of what new and additional financial resources have been provided, and how it has been determined that such resources are new and additional;

All funds disbursed in the 2021-22 period are new and additional to the funds disbursed in the previous reporting period.

(s) How the information provided reflects a progression from previous levels in the provision and mobilization of finance under the Paris Agreement;

The integration of environmental protection, including climate change, has been strengthened in recent years, particularly following the adoption of the new Development Cooperation and Humanitarian Aid Strategy in 2018, and in light of preparations for the Guidelines for Integrating Environmental Protection into International Development Cooperation and Humanitarian Aid. This integration necessitates a comprehensive shift in mindset, both on the part of financial institutions and implementing agencies in donor countries, as well as on the part of recipient institutions.[124]

(t) Information on reporting on multilateral finance, including:
(i) Whether the multilateral finance reported is based on the Party's inflow contribution to a multilateral institution and/or on the Party's share in the outflow of the multilateral institution;
(ii) Whether and how multilateral finance has been reported as climate-specific and how the climate-specific share was calculated, including by, for example, using existing international standards;
(iii) Whether multilateral finance has been reported as core/general, with the understanding that the actual climate finance amount it would transfer into depends on the programming choices of the multilateral institutions;
(iv) Whether and how multilateral finance has been attributed to the reporting Party.

Multilateral finance has been reported based on Slovenia's contributions to inflows to multilateral institutions. The climate-specific share is calculated using the multilateral share contributions reported by OECD DAC. Similarly, multilateral finance is attributed to Slovenia based on the calculation of inflows from Slovenia and outflows from previous years, as consolidated by OECD DAC.

Multilateral finance has been reported as basic/general, with the understanding that the actual amount of climate finance that an organisation would channel depends on the strategic priorities agreed upon with the governing bodies, as well as the programming choices of multilateral institutions.

122. A description of the underlying assumptions, definitions and methodologies used to provide information on technology development and transfer and capacity-building support.

Unlike the allocation of mitigation or adaptation targets to a project, where Rio markers are used, no comparable system exists for identifying components of technology transfer or capacity-building within a project. Therefore, Slovenia relies on qualitative assessments based on definitions used by the EU:

*Technology Development and Transfer*: This encompasses a wide range of processes, including the exchange of knowledge and expertise and the provision of equipment to support climate change mitigation and adaptation. Technology transfer can take place among various stakeholders, including governments, private sector organisations, financial institutions, non-governmental organisations (NGOs), and research or educational institutions. The term transfer includes the process of learning to understand, use, and replicate technology, ensuring the ability to adopt the most appropriate technologies, adapt them to local conditions,

[124] From 2025, the integration of environmental protection as a cross-cutting theme in the Development Cooperation and Humanitarian Aid Strategy of the Republic of Slovenia will be ensured through a gender-based assessment, which will be a mandatory annex to the content plan of project proposals..

and integrate them with local (indigenous) technologies (adapted from the IPCC's definition of technology transfer related to climate change).

*Capacity-building*: Capacity-building refers to efforts aimed at developing, strengthening, and enhancing existing scientific and technical skills, capacities, and institutions, particularly in developing countries. This enables these countries to effectively assess, adapt, manage, and develop technologies. Activities should be tailored to each country and must take into account the specific needs and circumstances of each country, while aligning with their strategies, priorities, and sustainable development initiatives (adapted from the UNFCCC definition of capacity-building activities).

## IV.C. Information on financial support provided and mobilized under Article 9 of the Paris Agreement

123. Relevant information, in a tabular format, for the previous two reporting years without overlapping with the previous reporting periods, on bilateral and regional financial support provided, specifying:
(a) Year (calendar year, fiscal year);
(b) Amount (in United States dollars and domestic currency) (the face value and, on a voluntary basis, the grant-equivalent value);
(c) Recipient, including, to the extent possible, information on the recipient region or country and the title of the project, programme, activity or other (specify);
(d) Status (disbursed, committed);
(e) Channel (bilateral, regional, multi-bilateral, other (specify));
(f) Funding source (ODA, OOF, other (specify));
(g) Financial instrument (e.g. grant, concessional loan, non-concessional loan, equity, guarantee, insurance, other (specify));
(h) The type of support (e.g. adaptation, mitigation or cross-cutting);
(i) Sector (e.g. energy, transport, industry, agriculture, forestry, water and sanitation, cross-cutting, other (specify));
(j) Subsector, as available;
(k) Additional information, as available (such as project/programme details, implementing agency and, to the extent possible, link to relevant project/programme documentation);
(l) Whether it contributes to capacity-building and/or technology development and transfer objectives, as available. 2. Multilateral channels
124. Relevant information, in a tabular format, for the previous two reporting years without overlapping with the previous reporting periods, on financial support provided through multilateral channels, specifying:
(a) Year (calendar year, fiscal year);
(b) Institution (e.g. multilateral fund, the operating entities of the Financial Mechanism, entities of the Technology Mechanism, multilateral financial institution, international organization, other (specify));
(c) Amount (in United States dollars and domestic currency) (the face value and, on a voluntary basis, the grant-equivalent value);
(d) Core-general or climate-specific, as applicable;
(e) Inflows and/or outflows, as applicable;
(f) Recipient (e.g. country, region, global, project, programme, activity, other (specify)), as applicable, as available;
(g) Status (disbursed, committed);
(h) Channel (multilateral, multi-bilateral);
(i) Funding source (ODA, OOF, other (specify));
(j) Financial instrument (e.g. grant, concessional loan, non-concessional loan, equity, guarantee, insurance, other (specify));
(k) The type of support (e.g. adaptation, mitigation or cross-cutting), as available;
(l) Sector (e.g. energy, transport, industry, agriculture, forestry, water and sanitation, cross-cutting, other (specify)), as available;
(m) Subsector, as available;

(n) Whether it contributes to capacity-building and/or technology development and transfer objectives, as applicable, as available. 3. Information on finance mobilized through public interventions
125. Relevant information, in textual and/or tabular format, for the previous two reporting years without overlapping with the previous reporting periods, on financial support mobilized through public interventions through bilateral, regional and multilateral channels, including the operating entities of the Financial Mechanism and entities of the Technology Mechanism, as applicable and to the extent possible:
(a) Year (calendar year, fiscal year);
(b) Amount (in United States dollars and domestic currency) (the face value and, on a voluntary basis, the grant-equivalent value, if applicable);
(c) Amount of resources used to mobilize the support (in United States dollars and domestic currency);
(d) Type of public intervention used (e.g. grant, concessional loan, nonconcessional loan, equity, guarantee, insurance, policy intervention, capacity-building, technology development and transfer, technical assistance);
(e) Recipient (country, region, global, project, programme, activity, other (specify));
(f) Channel (bilateral, regional, multilateral);
(g) The type of support (e.g. adaptation, mitigation or cross-cutting);
(h) Sector (e.g. energy, transport, industry, agriculture, forestry, water and sanitation, cross-cutting, other (specify));
(i) Subsector;
(j) Additional information.

Slovenian climate finance from all public sources totalled EUR 9.70 million (Figure 39) in the reporting period. In 2021, Slovenia provided EUR 4.94 million, and in 2022, EUR 4.76 million (Tables 19 and 20). In 2021, EUR 1.56 million (31.5%) of this finance was channelled through bilateral channels, while EUR 3.4 million (68.5%) was channelled through multilateral channels. In 2022, bilateral climate finance increased to EUR 2.35 million (49.3% of the total), while multilateral climate finance decreased to EUR 2.41 million.

A further EUR 204,000 was mobilised through private channels (Table 23).

A summary of information on bilateral and multilateral financial support is presented in the tables below. Detailed information can be found in CTF Table III.1, which has been submitted separately.

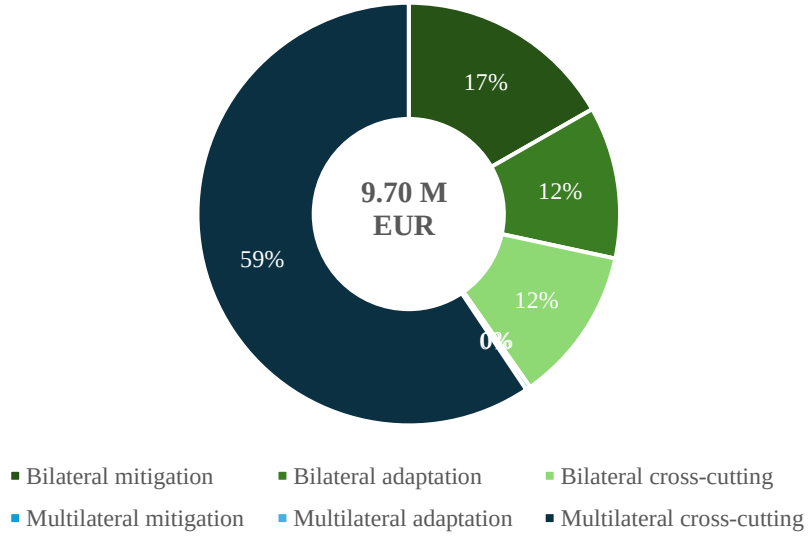


***Figure 41: Total climate finance by channel and type of support, 2021–2022***

| Type of support provided | Bilateral | | Multilateral | | TOTAL | |
|---|---|---|---|---|---|---|
| | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) |
| Mitigation | 622.9 | 737.2 | 0.0 | 0.0 | 622.9 | 737.2 |
| Adaptation | 568.8 | 673.2 | 0.0 | 0.0 | 568.8 | 673.2 |
| Cross-cutting | 365.8 | 432.9 | 3,380.9 | 4,001.0 | 3,746.7 | 4,434.0 |
| **TOTAL** | **1,557.6** | **1,843.3** | **3,380.9** | **4,001.0** | **4,938.5** | **5,844.3** |

***Table 19: Financial support provided in 2021***

| Type of support provided | Bilateral | | Multilateral | | TOTAL | |
|---|---|---|---|---|---|---|
| | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) |
| Mitigation | 999.9 | 1,052.5 | 0.0 | 0.0 | 999.9 | 1,052.5 |
| Adaptation | 560.4 | 589.9 | 33.3 | 35.1 | 593.7 | 625.0 |
| Cross-cutting | 787.7 | 829.1 | 2,378.2 | 2,503.3 | 3,165.8 | 3,332.4 |
| **TOTAL** | **2,347.9** | **2,471.5** | **2,411.5** | **2,538-4** | **4,759-4** | **5,009.9** |

***Table 20: Financial support provided in 2022***

| Sector | 2021 | | 2022 | |
|---|---|---|---|---|
| | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) |
| Energy | 0.0 | 0.0 | 550.1 | 579.1 |
| Transport | 0.0 | 0.0 | 0.0 | 0.0 |
| Industry | 0.0 | 0.0 | 100.0 | 105.3 |
| Agriculture | 45.0 | 53.3 | 56.7 | 59.7 |
| Forestry | 157.0 | 185.8 | 142.5 | 150.0 |
| Water and Sanitation | 1,112.6 | 1,316.7 | 1,200.1 | 1,263.3 |
| Cross-cutting | 231.1 | 273.4 | 190.6 | 200.6 |
| Other | 11.9 | 14.1 | 107.8 | 113.5 |
| **TOTAL** | **1,557.6** | **1,843.3** | **2,347.9** | **2,471.5** |

***Table 21: Bilateral financial support provided by sector***

| | 2021 | | 2022 | |
|---|---|---|---|---|
| | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) |
| The World Bank Group | 925.5 | 1,095.2 | 988.1 | 1,040.1 |
| GEF | 1,998.4 | 2,364.9 | 1,063.1 | 1,119.1 |
| Specialized Agencies of the United Nations (UNFCCC and the Montreal Protocol) | 179.5 | 212.4 | 210.5 | 221.6 |
| FAO | 170.5 | 201.8 | 25.3 | 26.7 |
| Council of Europe | 107.1 | 126.8 | 124.5 | 131.0 |
| **TOTAL** | **3,380.9** | **4,001.0** | **2,411.5** | **2,538.4** |

***Table 22: Multilateral financial support provided in 2021 and 2022***

A summary of information on mobilised bilateral support is presented in the table below. In 2022, Slovenia did not mobilise new support for climate finance. It should be noted that government departments, when reporting to the national coordinator for ODA, account for

mobilised private finance at the start of project implementation. Consequently, for projects already in progress, mobilised private finance has already been reported.

| Type of support provided | 2021 | | 2022 | | TOTAL | |
|---|---|---|---|---|---|---|
| | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) | EUR ('000) | USD ('000) |
| Mitigation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Adaptation | 49.7 | 58.8 | 0.0 | 0.0 | 49.7 | 58.8 |
| Cross-cutting | 27.21 | 32.2 | 0.0 | 0.0 | 27.21 | 32.2 |
| **TOTAL** | **76.91** | **91.02** | **0.0** | **0.0** | **76.91** | **91.02** |

***Table 23: Financial support mobilised in 2021 and 2022***

## IV.D. Information on support for technology development and transfer provided under Article 10 of the Paris Agreement

126. Information, in textual format, on support for technology development and transfer provided under Article 10 of the Paris Agreement, including, to the extent possible, qualitative and/or quantitative information on:
(a) Strategies employed to support technology development and transfer, including case studies;
(b) Support provided at different stages of the technology cycle;
(c) Support for the development and enhancement of endogenous capacities and technologies of developing country Parties;
(d) Efforts to encourage private sector activities related to technology development and transfer and how such efforts support developing country Parties;
(e) Efforts to accelerate, encourage and enable innovation, including research, development and deployment efforts, and collaborative approaches to research and development;
(f) Knowledge generated

Slovenia is taking active steps to integrate technology development and transfer into its bilateral climate finance projects. Already at the project selection stage, one of the criteria for evaluating infrastructure projects is the development or transfer of technologies, with additional points awarded to projects that incorporate these components. These activities may involve the transfer of both soft technologies (such as capacity-building, research and training, development of information networks, etc.) and hard technologies; many activities possess characteristics of both.

In providing external support for climate finance, Slovenia has developed expertise in technologies related to water and sanitation, which is why the majority of technology development and transfer projects are carried out in this sector. Technologies such as satellite imagery for improved flood management, 3D visualisation applications, and systems for monitoring water resources have also been successfully implemented within the framework of international development cooperation (see Tables 24 and 25).

In relation to the technology cycle of projects, most support is provided during the growth and maturity phases. During the reporting period, no projects were implemented to support research into climate-relevant technologies in developing countries, or to foster endogenous capacities and technologies.

Some private sector initiatives related to technology development and transfer have been successfully mobilised (see the case study in Tables 24 and 25). However, Slovenia aims to further expand and strengthen these efforts in the future.

| | | | |
|---|---|---|---|
| **Programme title**: Ganga – Satellite imagery and river flood modelling | | | |
| **Recipient**: India, Indian Institute of Technology Kanpur | **Sector:** Water and Sanitation | **Total amount of support**: EUR 108,675.00 | **Period:** 2022–2023 |
| **Technology developed and/or transferred:** flooding model and a 3D visualisation application | | | |
| **Objective and description**: GangaSat is a pilot project that provided a basis for demonstrating the socio-economic and environmental benefits of floodplain mapping. The project mapped flood-prone areas around two cities, Delhi on the Ganges and Varanasi on the Yamuna, using satellite imagery. An assessment of the flood history was made based on data available for the last 3-5 years, and the results were provided in digital form to enable numerical analysis and post-processing with artificial intelligence for situational awareness. Radar and optical imagery from Sentinel satellites and optical imagery from the Nemo-HD satellite was used for this purpose. | | | |
| **Results**: Based on these images, a flooding model and a 3D visualisation application was developed, which can be applied to other flood areas. This technology allows better flood management and prevention. | | | |

***Table 24: Case Study 1 – Satellite Imagery and River Flood Modelling in India***

| | | | |
|---|---|---|---|
| **Program name**: Sustainable management of water and other resources for better health and livelihoods in Karongi District, Rwanda | | | |
| **Recipient:** Rwanda | **Sector:** Water and Sanitation | **Total amount of support**: EUR 301,296.10 | **Period:** 2021–2023 |
| **Technology developed and/or transferred**: water supply infrastructure | | | |
| **Objective and description**: The project addresses the lack of access and sustainability of water and other resource management by people living in the hill sectors of Mutuntu, Gashari, Rugabano, Rwankuba in Karongi District in W Rwanda, where 45.3% of the people live below the poverty line, 85.2% depend on agriculture, and there are almost no income opportunities, especially for women, youth. On depleted land, with erosion, droughts, poor access to water, it is difficult to grow enough food. 17.2% of households drink unsafe water (33% of water systems destroyed), which with poor hygiene deteriorates health, increases the spread of CWD-19. The specific objective was to improve access and sustainable management of water and environmental resources in 4 sectors in Karongi by September 2023 and to enable 1,450 vulnerable people to improve their livelihoods and health. GeoCodis sought to enable further development by setting up a water supply monitoring system in 4 sectors, with wifi servers for information access and analysis. | | | |
| **Results:**<br>• 20 water stations built for access to clean water, 2 water systems rehabilitated and 6 water kiosks to combat covid-19; 6 wells newly built or rehabilitated;<br>• domestic animals, seeds, fruit trees and hygiene kits provided to 1450 families from 29 vulnerable communities;<br>• capacity building for sustainable management (255 people trained in water resources management, 266 people trained in business plan preparation and 1450 families taught better agricultural practices);<br>• 58 savings and credit groups set up;<br>• 2 wi-fi servers for information on water supply configured. | | | |

***Table 25: Case study 2 – Sustainable water and resource management for improved health and livelihood in Rwanda***

The development and transfer of technologies are also embedded in the activities of multilateral international organisations (e.g., IBRD) and climate funds (such as the Green Climate Fund (GCF) and GEF), to which Slovenia provides financial support. These projects include the installation of renewable energy equipment, climate change adaptation technologies (such as flood-resistant construction), as well as innovative agricultural technologies and methods.

127. Quantitative and/or qualitative information in a common tabular format on measures or activities related to support for technology development and transfer implemented or planned since their previous report, including, to the extent possible and as relevant:
(a) Title;
(b) Recipient entity;
(c) Description and objectives;
(d) Type of support (mitigation, adaptation or cross-cutting);
(e) Sector;

(f) Type of technology;
(g) Status of measure or activity;
(h) Whether the activity was undertaken by the public and/or private sector.

| Title | Recipient entity | Project objectives | Type[1] | Sector | Type of technology | Status | Activity under-taken |
|---|---|---|---|---|---|---|---|
| Sustainable management of water and other resources for better health and livelihoods in Karongi District | Rwanda | To improve access and sustainable management of water and environmental resources; to enable 1,450 vulnerable people to improve their livelihoods and health | cc | Water and sanitation | Water supply infrastructure, water supply monitoring system wifi servers for information access and analysis | Completed | Public and private sector |
| Renovation of the Zletovica hydrosystem | North Macedonia | To ensure an uninterrupted supply of quality drinking water for the inhabitants of the municipalities | cc | Water and sanitation | Electronic and hydro-mechanical equipment for the hydrosystem | Completed | Public sector |
| Ganga - satellite imagery and modelling of river flooding | India, Indian technological institute Kanpur | To map flood-prone areas for better flood management | cc | Water and sanitation | Flooding model and a 3D visualisation application | Completed | Public and private sector |
| Reconstruction and upgrading of the wastewater treatment plant in Zhytomyr | Ukraine | To provide modern facilities for treatment of all wastewater in accordance with national legislative requirements and Directive 91/271/ EEC | cc | Water and sanitation | Automatic control system, pumping station | Completed | Public and private sector |
| Reconstruction of public lighting in the municipality of Gradiška | Bosnia and Herzegovina | To modernise public lighting, thereby reducing electricity consumption and light pollution, and increasing traffic safety | m | Energy | LED bulbs | Completed | Public sector |
| Public lighting in Vrnjačka Banja | Serbia | To modernise public lighting, thereby reducing electricity consumption and light pollution, and increasing traffic safety | m | Energy | LED bulbs | Ongoing | Public sector |
| Water, hygiene, food for a decent life in Darfur | Sudan | To provide access to drinking water, sanitation, knowledge, irrigation water and seeds for agriculture | a | Water and sanitation | Irrigation system with solar-powered pump | Completed | Public sector |
| Development of an inclusive and sustainable global supply chain for tomato processing | Egypt | To improve food quality and safety throughout the supply chain, and to introduce new | a | Industry | Greenhouse monitoring system | Completed | Public and private sector |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | products, new production techniques | | | | | |
| Voluntary contribution for decentralised wastewater systems | Developing countries, unspecified | To improve wastewater management | a | Water and sanitation | Decentralised Wastewater Treatment Systems | Ongoing | Public and private sector |
| Women's entrepreneurship development in agriculture in SE Serbia | Serbia | To develop women's entrepreneurship in agriculture in rural areas | cc | Agriculture | Machine for home-made food processing | Completed | Public and private sector |
| Renovation of the Phenol plant site in the Lukavac industrial zone | Bosnia-Herzegovina | Remediation of a contaminated industrial site to reduce water and soil pollution, thereby improving health outcomes | cc | Cross-cutting | Modern remediation technology | Completed | Public and private sector |
| Converting rainwater into drinking water | Comoros | To develop resilience to climate change and access to basic social needs, in particular water and food self-sufficiency | a | Water and sanitation | Rainwater harvesting system | Completed | Public and private sector |
| Reconstruction and upgrading of the Alagovac drinking water treatment plant in the municipality of Nevesinje | Bosnia-Herzegovina | To ensure sufficient drinking water of adequate quality | a | Water and sanitation | Upgrading of water treatment plant | Completed | Public sector |

***Table 26: Measures and activities related to support for technology development and transfer, 2021–2022***

*[1] Type: c = cross-cutting, m = mitigation, a = adaptation*

# IV.E. Information on capacity-building support provided under Article 11 of the Paris Agreement

128. Information, in textual format, on capacity-building support provided under Article 11 of the Paris Agreement, including, to the extent possible, qualitative and/or quantitative information on:
(a) Strategies employed to provide capacity-building support, including case studies;
(b) How capacity-building support that was provided responds to the existing and emerging capacity-building needs, priorities and gaps identified by developing country Parties in the areas of mitigation, adaptation, and technology development and transfer;
(c) Policies that promote capacity-building support;
(d) Involvement of stakeholders;
(e) How support for capacity-building actions in developing country Parties that was provided promotes the sharing of lessons learned and best practices.

Capacity-building is central to nearly all development cooperation efforts. It enhances the ability to operate within a country's own systems and lays the foundation for sustainable outcomes with long-term impact. As such, it is a crucial component of Slovenian development cooperation, including bilateral climate finance. The measures and activities related to capacity-building support provided in 2021 and 2022 are outlined in Table 27.

Slovenia provides capacity-building support at both the individual and organisational levels. At the individual level, the goal is to empower individuals by enhancing their skills, knowledge, and abilities. In this context, Slovenia has provided support to strengthen capacity in areas ranging from forest management practices and modern agricultural techniques to entrepreneurship and business development. At the organisational level, capacity-building focuses on enhancing the ability of regional, national, and local organisations in implementing climate strategies. Support provided in this area includes technical assistance and training for government employees. Table 27 provides examples of capacity-building support delivered both at the individual level (entrepreneurship training) and at the organisational level (participatory processes related to female entrepreneurs and (self)-employment).

Support, at both the individual and organisational levels, can be provided as a standalone initiative or integrated into a larger project. Regardless of its form, Slovenia adheres to the principle of national ownership in all its capacity-building support. This involves engaging relevant stakeholders from partner countries, such as civil society organisations and local authorities, in the preparation, implementation, and monitoring phases of projects.

Slovenia also contributes to multilateral climate funds and organisations that finance climate projects (e.g., GEF, World Bank Group, etc.), incorporating capacity-building into their activities. This may involve various training and educational programmes aimed at empowering stakeholders in developing countries to design mitigation and adaptation projects or develop capacity in specific areas of climate change. Generally speaking, capacity-building is an integral part of most cooperation projects and programmes, as it is vital to ensuring the sustainability of activities.

| | | | |
|---|---|---|---|
| **Programme title:** BiHUB – Support for socially responsible entrepreneurship for women | | | |
| **Recipient entity:** Bosnia and Herzegovina | **Sector:** Cross-cutting | **Total amount of support:** EUR 158,421.00 | **Period:** 2020–2022 |
| **Capacity building support provided:** entrepreneurship (start-up) training | | | |
| **Objective and description:** The project aims to empower women in the Central Bosphorus Canton and Canton 10 by promoting women's socially responsible entrepreneurship and ensuring their involvement in decision-making processes. Through the HUB programme for women's socially responsible entrepreneurship, women and men are empowered to enter the entrepreneurial waters by launching start-ups. This will ensure women's inclusion in the labour market and society and the opportunity to lead in economic life. The project also aimed to develop women's involvement in decision-making processes to ensure lasting systemic support for women's entrepreneurship. To this end, a participatory advocacy campaign was carried out with the aim of designing and | | | |

| |
|---|
| adopting at least one measure to support women's entrepreneurship and innovative forms of women's employment and their regular inclusion in decision-making processes. Both women and men were actively involved in the actions and had the opportunity to propose and decide on specific systemic measures. In addition, key stakeholders were trained in participatory processes to support and promote women's entrepreneurship and women's (self-)employment. |
| **Results:** 15 women's start-ups were founded in different fields such as tourism (travel agencies, development of innovative tourism services and products, etc.), IT and high-tech, fashion industry, crafts (carpentry, traditional products, etc.), agriculture (production and sale of local products) and other ideas that demonstrate innovation and social responsibility. In addition, thanks to the training of key stakeholders in participatory processes, three actions in the area of women's entrepreneurship and (self-) employment were adopted. |

***Table 27: Case study 1 – Supporting women's socially responsible entrepreneurship in Bosnia and Herzegovina***

| |
|---|
| 129. Quantitative and/or qualitative information in a common tabular format on measures or activities related to capacity-building support implemented or planned since their previous report, including, to the extent possible and as relevant:<br>(a) Title;<br>(b) Recipient entity;<br>(c) Description and objectives;<br>(d) Type of support (mitigation, adaptation or cross-cutting);<br>(e) Status of measure or activity. |

| Title | Recipient entity | Capacity building description and objectives | Type | Sector | Status of measure or activity |
|---|---|---|---|---|---|
| Measures for sustainable use of forests in the municipality of Adigeni | Georgia | Training on forest management planning, safe forest work, nature conservation and value chain development | cross-cutting | Forestry | Completed |
| Tackling the root causes of discrimination against women in Albania | Albania | Training and training-the-trainer on gender inequalities | mitigation | Cross-cutting | Completed |
| BiHUB - Supporting women's socially responsible entrepreneurship | Bosnia-Herzegovina | Empowering for entrepreneurship (entrepreneurship training), training key stakeholders in participatory processes to support and promote women's entrepreneurship | mitigation | Cross-cutting | Completed |
| Women's entrepreneurship development in agriculture in SE Serbia | Serbia | Development of women's entrepreneurship in agriculture in rural areas | cross-cutting | Agriculture | Completed |
| Renovation of the Phenol plant site in the Lukavac industrial zone | Bosnia-Herzegovina | Remediation of a contaminated industrial site to reduce water and soil pollution, thereby improving health outcomes | cross-cutting | Cross-cutting | Completed |
| Sustainable management of water and other resources for better health and livelihoods in Karongi District | Rwanda | Teaching better agricultural practices, training in business plan preparation and in water resource management | Cross-cutting | Water and sanitation | Completed |

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| Water for a decent life | Uganda | Capacity building on water and sanitation-related activities, such as rainwater harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies | adaptation | Water and sanitation | Completed |
| Activities under DPPI SEE | Western Balkans | The Disaster Preparedness and Prevention Initiative for SEE (DPPI SEE) is a regional initiative aimed at strengthening cooperation between the countries of the region in the field of disaster protection, in particular the transfer of knowledge and experience and the integration of the region into European networks. | adaptation | Cross-cutting | Ongoing |
| Water, hygiene, food for a decent life in Darfur | Sudan | Provision of access to drinking water, sanitation, knowledge, irrigation water and seeds for agriculture | adaptation | Water and sanitation | Completed |
| Converting rainwater into drinking water | Comoros | Development of resilience to climate change and access to basic social | adaptation | Water and sanitation | Completed |

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| | | needs, in particular water and food self-sufficiency | | | |
| Reconstruction and upgrading of the Alagovac drinking water treatment plant in the municipality of Nevesinje | Bosnia-Herzegovina | Sufficient drinking water of adequate quality | adaptation | Water and sanitation | Completed |
| Reconstruction and upgrading of the wastewater treatment plant in Zhytomyr | Ukraine | Provision of modern facilities for treatment of all wastewater, in accordance with national legislative requirements and Directive 91/271/ EEC | Cross-cutting | Water and sanitation | Completed |
| Strengthening domestic public revenue mobilisation for sustainable development (MDJP) | Western Balkans | Training, experience sharing and networking to improve understanding of how to strengthen public revenue mobilisation for the achievement of the Sustainable Development Goals | cross-cutting | Cross-cutting | Completed |
| Sustainable forest and wildlife management in the Western Balkans 2022-2023 | Western Balkans | Establishment of Regional Expert Advisory Group to strengthen the common forest policy dialogue, improve cooperation and exchange good practices for sustainable territorial development in the field of natural resource management | cross-cutting | Forestry | Completed |
| Support to Operating Structure of the Programme of pre accession assistance for rural development IPARD III (2021-2027) | Serbia | Financing the visit of the Serbian delegation in order to advise and exchange experiences of EU Member States in the preparation of secondary | cross-cutting | Agriculture | Completed |

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| | | national legislation for the establishment of IPARD Action 4 ""Agri-environmental-climate measures"" | | | |
| Training: Conditionality administrative controls, European Agricultural Guarantee Fund-EAGF and the European Agricultural Fund for Rural Development-EAFRD | Serbia | Bilateral development cooperation on the basis of the adopted Action Plan for Technical Assistance from Slovenia to Serbia | cross-cutting | Agriculture | Completed |
| Presentation of Experiences of the Agency RS Agricultural Markets and Rural Development in Accounting and Execution of Payments | Turkey | Bilateral development cooperation on the basis of the adopted Action Plan for Technical Assistance from Slovenia to Turkey | cross-cutting | Agriculture | Completed |
| Chapter 11 - Agriculture and rural development | Western Balkans | Provision of targeted advice and transfer good practices to Western Balkan EU candidate states in the design and selection of measures to expand and improve forest resources, restore fire damaged forests and integrate sustainable wildlife management | cross-cutting | Forestry | Completed |
| Ganga - satellite imagery and modelling of river flooding | India | Training on the use of GangaSat equipment for better flood management | cross-cutting | Water and sanitation | Completed |

***Table 28: Measures and activities related to capacity-building support, 2021–2022***

# V. Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

Not applicable.

# VI. Information to be reported when national communications and biennial transparency reports are submitted jointly every four years

Not applicable.

# VII. Information on flexibility

Not applicable.

# VIII. Improvements in reporting over time

Not applicable for the first BTR reporting.

# IX. Any other information the Party considers relevant to the achievement of the objective of the Paris Agreement, and suitable for inclusion in its biennial transparency report

Slovenia has been actively promoting the human right to a clean, healthy and sustainable environment (HR2HE) on the international stage for many years. A decade ago, Slovenia played a key role in initiating discussions on this issue and, together with other countries, advocated for the adoption of the resolution on HR2HE—first in the Human Rights Council in Geneva in October 2021, and subsequently in the United Nations General Assembly in July 2022. This resolution recognises the close interconnection between environmental degradation, the threat to biodiversity, pollution of natural resources, climate change, and the realisation of human rights. The adoption of the resolution marks an important milestone in Slovenia's efforts to connect the environment with human rights and strengthens the hope and confidence of future generations in the sustainable future of the planet.

On the occasion of the 75th anniversary of the Universal Declaration of Human Rights, Slovenia, together with other countries, launched a joint pledge in December 2023 to advance normative progress and ensure the effective implementation of the HR2HE at both national and global levels, with the aim of placing human rights at the heart of global environmental action. Slovenia is also advocating for the inclusion of the HR2HE in COP outcomes and decision texts.

The linking of human rights with climate action is crucial for ensuring effective and fair solutions. Climate change disproportionately affects various social groups, such as women, children, persons with disabilities, the elderly, as well as individuals and groups in vulnerable situations. Upholding the principle of women’s inclusion in climate diplomacy, environmental governance, and decision-making enhances the effectiveness of climate policies, strengthens societal resilience, and contributes to peace and conflict prevention. Slovenia continues its efforts to integrate the gender perspective into climate policies, recognising that this is not only a question of equality but also a key factor in achieving sustainable and long-term solutions.

In its foreign policy, Slovenia prioritises climate, water, women's empowerment, and the environmental protection. As a member of the Group of Friends on Climate and Security at the United Nations, Slovenia has identified “climate, peace, and security” as one of its thematic priorities in the UN Security Council, with a particular focus on water security, women’s empowerment, and conflict prevention. Slovenia actively works to integrate these dimensions into the Security Council’s outcomes, including through the organisation of discussions—such as open debates and Arria-formula meetings. In 2025, Slovenia will also serve as a member of the Informal Expert Group on Climate, Peace, and Security within the Security Council.

Slovenia addresses the nexus of climate change, peace, and security at international conferences, including Africa Day. The Peace Operations Training Centre (POTC), which operates under the Centre for European Perspective (CEP), organises annual training on climate change, peace, and security for peacekeeping personnel from third countries.

# Annex

The Biennial Transparency Report includes the report itself together with the information submitted in tabular format in the CRTs and CTF tables. Accordingly, the following annexes are made available as separate submissions on the UNFCCC website:

• CRT for GHG emissions and removals

• CTF for information necessary to track progress

• CTF for information on support provided and mobilised

The NID is submitted as a standalone document.

# Annex 1: Common tabular formats on information necessary to track progress

**Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates[a]**

| | *Description* |
|---|---|
| Target(s) and description, including target type(s), as applicable[b, c] | **Economy-wide net domestic reduction of at least 55% in GHG emissions by 2030 compared to 1990.**<br>**The term 'domestic' means without the use of international credits.**<br>**Target type: Economy-wide absolute emission reduction.** |
| Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable | **Single year target, 2030.** |
| Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable | **Base year: 1990.**<br>**Net GHG emissions level in 1990:**<br>**4 699 405 kt $CO_2$eq.** |
| Time frame(s) and/or periods for implementation, as applicable | **2021-2030** |
| Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable | **Geographical scope: EU Member States (Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden) including EU outermost regions (Guadeloupe, French Guiana, Martinique, Mayotte, Reunion, Saint Martin (France), Canary Islands (Spain), Azores and Madeira (Portugal)).**<br>**Sectors covered, as contained in Annex I to decision 5/CMA.3:**<br>**Energy**<br>**Industrial processes and product use**<br>**Agriculture**<br>**LULUCF**<br>**Waste**<br>**International Aviation: Emissions from civil aviation activities as set out for 2030 in Annex I to the EU ETS Directive are included only in respect of $CO_2$ emissions from flights subject to effective carbon pricing through the EU ETS. With respect to the geographical scope of the NDC these comprise emissions in 2024-26 from flights between the EU Member States and departing flights to Norway, Iceland, Switzerland and United Kingdom.**<br>**International Navigation: Waterborne navigation is included in respect of CO2, $CH_4$ and $N_2O$ emissions from maritime transport voyages between the EU Member States.**<br>**Gases:**<br>**$CO_2$**<br>**$CH_4$**<br>**$N_2O$**<br>**HFCs)**<br>**PFCs**<br>**$SF_6$**<br>**$NF_3$**<br>**The included LULUCF categories and pools are as defined in decision 5/CMA.3.** |
| Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris | **The EU's at least 55% net reduction target by 2030 is to be achieved through domestic measures only, without contribution from international credits.**<br>**The EU will account and report for its cooperation with other Parties in** |

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| Agreement, as applicable | **a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA.** |
| Any updates or clarifications of previously reported information, as applicable[d] | **The information on the NDC scope contains clarifications/further details compared to the information provided in the updated NDC of the EU.** |

*Note*: This table is to be used by Parties on a voluntary basis.

[a] Each Party shall provide a description of its NDC under Article 4, against which progress will be tracked. The information provided shall include required information, as applicable, including any updates to information previously provided (para. 64 of the MPGs).

[b] For example: economy-wide absolute emission reduction, emission intensity reduction, emission reduction below a projected baseline, mitigation co-benefits of adaptation actions or economic diversification plans, policies and measures, and other (para. 64(a) of the MPGs).

[c] Parties with both unconditional and conditional targets in their NDC may add a row to the table to describe conditional targets.

[d] For example: recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches (para. 64(g) of the MPGs).

**1. Structured summary: Description of selected indicators**

| *Indicator(s) selected to track progress*[a] | *Description* |
|---|---|
| {Indicator} | **Annual total net GHG emissions consistent with the scope of the NDC in $CO_2$eq.** |
| Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate[b] | **The reference level is total net GHG emissions of the EU in the base year (1990). The reference level value for the EU is 4 699 405 kt $CO_2$eq.** |
| Updates in accordance with any recalculation of the GHG inventory, as appropriate | **This is the first time the reference level is reported, hence there are no updates.**<br>**The value of the reference level may be updated in the future due to methodological improvements to the EU GHG inventory and to the determination of international aviation and navigation emissions in the NDC scope.** |
| Relation to NDC[c] | **The indicator is defined in the same unit and metric as the target of the NDC. Hence it can be used directly for tracking progress in implementing and achieving the NDC target.** |

*Notes*: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional selected indicator and related information.

[a] Each Party shall identify the indicator(s) that it has selected to track progress of its NDC (para. 65 of the MPGs).

[b] Each Party shall provide the information for each selected indicator for the reference point(s), level(s), baseline(s), base year(s) or starting point(s) and shall update the information in accordance with any recalculation of the GHG inventory, as appropriate (para. 67 of the MPGs).

[c] Each Party shall describe for each indicator identified how it is related to its NDC (para. 76(a) of the MPGs).

**2. Structured summary: Definitions needed to understand NDC**

| *Definitions*[a] | |
|---|---|
| *Definition needed to understand each indicator:* | |
| **Annual total net GHG emissions** | **Total net GHG emissions correspond to the annual total of emissions and removals reported in $CO_2$ equivalents in the latest GHG inventory of the EU. The totals comprise all sectors and gases listed in the table entitled 'Reporting format for the description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates.' Indirect CO2 emissions are included from those Member States that report these emissions.** |
| *Any sector or category defined differently than in the national inventory report:* | |
| {Sector} **Not applicable** | |
| {Category} **Not applicable** | |
| *Definition needed to understand mitigation co-benefits of adaptation actions and/or economic diversification plans:* | |
| {Mitigation co-benefit(s)} **Not applicable** | |
| *Any other relevant definitions:* | |
| **Not applicable** | |

*Notes*: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional sector, category, mitigation co-benefits of adaptation actions and/or economic diversification plans, indicator and any other relevant definitions.

[a] Each Party shall provide any definitions needed to understand its NDC under Article 4, including those related to each indicator identified in para. 65 of the MPGs, those related to any sectors or categories defined differently than in the national inventory report, or the mitigation co-benefits of adaptation actions and/or economic diversification plans (para. 73 of the MPGs).

**3. Structured summary: Methodologies and accounting approaches – consistency with Article 4, paragraphs 13 and 14, of the Paris Agreement and with decision 4/CMA.1**

| *Reporting requirement* | *Description or reference to the relevant section of the BTR* |
|---|---|
| *For the first NDC under Article 4:*[a] | |
| Accounting approach, including how it is consistent with Article 4, paragraphs 13–14, of the Paris Agreement (para. 71 of the MPGs) | **Net GHG emissions, calculated from emissions and removals from the GHG inventory of the EU and supplemented with data on international aviation and navigation collected in the Joint Research Centre's Integrated Database of the European Energy System (JRC-IDEES), are used to quantify progress towards implementing and achieving of the NDC in respect of the NDC target. This approach promotes environmental integrity, transparency, accuracy, completeness, comparability and consistency and ensures the avoidance of double counting, as described below. Existing methods and guidance under the Convention are taken into account, as described below.** |
| *For the second and subsequent NDC under Article 4, and optionally for the first NDC under Article 4:*[b] | |
| Information on the accounting approach used is consistent with paragraphs 13–17 and annex II of decision 4/CMA.1 (para. 72 of the MPGs) | **The European Union accounts for anthropogenic emissions and removals corresponding to its NDC consistent with paragraphs 13–17 and annex II of decision 4/CMA.1, as detailed below.** |
| Explain how the accounting for anthropogenic emissions and removals is in accordance with methodologies and common metrics assessed by the IPCC and in accordance with decision 18/CMA.1 (para. 1(a) of annex II to decision 4/CMA.1) | **The accounting for anthropogenic emissions and removals is based on the data contained in the EU GHG inventory, which is compiled in accordance with the 2006 IPCC Guidelines. The accounting for emissions from international aviation and navigation in the scope of the NDC is based on activity data, emission factors and methods which are in line with the IPCC guidelines. The accounting approach is also in accordance with decision 18/CMA.1 because the EU GHG inventory conforms with the provisions of chapter II of the Annex to decision 18/CMA.1.** |
| Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) | **The GHG data used for accounting is based on the GHG inventory of the EU. The methodology used for accounting consists of a balancing of GHG emissions and removals, which is consistent with the methodologies used in the GHG inventory of the EU.** |
| Explain how overestimation or underestimation has been avoided for any projected emissions and removals used for accounting (para. 2(c) of annex II to decision 4/CMA.1) | **Not applicable. Projected emissions and removals are not used for accounting.** |
| *For each NDC under Article 4:*[b] | |
| *Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement:* | |
| Each methodology and/or accounting approach used to assess the implementation and achievement of the target(s), as applicable (para. 74(a) of the MPGs) | **The methodology used to assess the implementation and achievement consists of a comparison of the reduction of net GHG emissions from the GHG inventory national total, including a share of GHG inventory international** |

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| | **aviation and navigation emissions in line with the NDC scope, with the NDC target.**<br>**The EU will account for its cooperation with other Parties in a manner consistent with guidance adopted by the CMA.** |
| Each methodology and/or accounting approach used for the construction of any baseline, to the extent possible (para. 74(b) of the MPGs) | **Progress is tracked by comparing annual net emissions with net emissions in the base year. No baseline is constructed.** |
| If the methodology or accounting approach used for the indicator(s) in table 1 differ from those used to assess the implementation and achievement the target, describe each methodology or accounting approach used to generate the information generated for each indicator in table 4 (para. 74(c) of the MPGs) | **Not applicable. The methodology/accounting approach used for the indicator in table 1 is the same as the methodology/accounting approach used to assess the implementation and achievement the target.** |
| Any conditions and assumptions relevant to the achievement of the NDC under Article 4, as applicable and available (para. 75(i) of the MPGs) | **Not applicable. The NDC is unconditional.** |
| Key parameters, assumptions, definitions, data sources and models used, as applicable and available (para. 75(a) of the MPGs) | **Net GHG emissions are the key parameter used for tracking progress in implementing and achieving the NDC. The GHG inventory of the EU is the data source used. Details on assumptions, definitions and models used for determining net GHG emissions can be found in the National Inventory Document of the EU.** |
| IPCC Guidelines used, as applicable and available (para. 75(b) of the MPGs) | **2006 IPCC Guidelines; and 2019 refinement to the 2006 IPCC Guidelines for some source categories.** |
| Report the metrics used, as applicable and available (para. 75(c) of the MPGs) | **100-year time-horizon global warming potential (GWP) values from the IPCC Fifth Assessment Report.** |
| For Parties whose NDC cannot be accounted for using methodologies covered by IPCC guidelines, provide information on their own methodology used, including for NDCs, pursuant to Article 4, paragraph 6, of the Paris Agreement, if applicable (para. 1(b) of annex II to decision 4/CMA.1) | **Not applicable.** |
| Provide information on methodologies used to track progress arising from the implementation of policies and measures, as appropriate (para. 1(d) of annex II to decision 4/CMA.1) | **Progress arising from the implementation of policies and measures is expressed in a reduction of GHG emissions or increase of GHG removals. The methodology used to assess such progress is based on the estimation of GHG emissions and removals in the GHG inventory of the EU and on data on international aviation and navigation monitored in the Joint Research Centre's Integrated Database of the European Energy System (JRC-IDEES).** |
| Where applicable to its NDC, any sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, as applicable (para. 75(d) of the MPGs) | **Sector-, category- and activity-specific assumptions, methodologies and approaches applicable to the NDC are described in the national inventory document of the EU and are consistent with IPCC guidance.**<br>**Emissions from international aviation and navigation in the scope of the NDC are determined based on activity data from the JRC-IDEES, using emission factors and methodologies consistent with IPCC guidance.** |

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| For Parties that address emissions and subsequent removals from natural disturbances on managed lands, provide detailed information on the approach used and how it is consistent with relevant IPCC guidance, as appropriate, or indicate the relevant section of the national GHG inventory report containing that information (para. 1(e) of annex II to decision 4/CMA.1, para. 75(d)(i) of the MPGs) | **NA**[125] |
| For Parties that account for emissions and removals from harvested wood products, provide detailed information on which IPCC approach has been used to estimate emissions and removals (para. 1(f) of annex II to decision 4/CMA.1, para. 75(d)(ii) of the MPGs) | **The EU accounts for emissions and removals from harvested wood products as an integral part of net GHG emissions and removals in the scope of the NDC. GHG emissions and removals from harvested wood products are determined in accordance with the production approach, as defined in Annex 12.A.1 to Volume 4 of the 2006 IPCC Guidelines for National GHG Inventories.** |
| For Parties that address the effects of age-class structure in forests, provide detailed information on the approach used and how this is consistent with relevant IPCC guidance, as appropriate (para. 1(g) of annex II to decision 4/CMA.1, para. 75(d)(iii) of the MPGs) | **The EU does not address the effects of age-class structure in forests in the accounting approach for its NDC.** |
| How the Party has drawn on existing methods and guidance established under the Convention and its related legal instruments, as appropriate, if applicable (para. 1(c) of annex II to decision 4/CMA.1) | **The EU has drawn on existing methods and guidance established under the Convention by using an NDC target which is an advancement of the quantified economy-wide emission reduction target for 2020, which was communicated and tracked under the Convention.** |
| Any methodologies used to account for mitigation co-benefits of adaptation actions and/or economic diversification plans (para. 75(e) of the MPGs) | **The NDC does not consist of mitigation co-benefits of adaptation actions and/or economic diversification plans. Hence these co-benefits were not accounted for, and no related methodologies were used.** |
| Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed related to Article 6 if relevant (para. 76(d) of the MPGs) | **GHG emissions and removals from the EU's GHG inventory, complemented with JRC-IDEES data for determining the share of emissions form international aviation and navigation in the NDC scope, are used for tracking the net GHG emission reductions. Emissions and removals are reported in line with IPCC guidelines, with the aim of neither over- nor underestimating GHG emissions.**<br>**GHG emissions and removals are reported by the EU and its Member States in their respective GHG inventories. For tracking progress towards implementing and achieving the EU NDC, only those net GHG emission reductions are counted which are reported at EU level.**<br>**For cooperative approaches under Article 6, corresponding adjustments are made in a manner consistent with guidance adopted by the CMA.** |
| Any other methodologies related to the NDC under Article 4 (para. 75(h) of the MPGs) | **Not applicable.** |
| *Ensuring methodological consistency, including on baselines, between the communication and implementation of NDCs (para. 12(b) of the decision 4/CMA.1):* | |

[125] To determine emissions and removals in the scope of the NDC, the EU does not disaggregate emissions and removals on managed land into those considered to result from human activities and those considered to result from natural disturbances.

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| Explain how consistency has been maintained in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines, between the communication and implementation of NDCs (para. 2(a) of annex II to decision 4/CMA.1) | **The scope, coverage, definitions, data sources, metrics and approaches are consistent between the communicated NDC and its implementation, as described in the BTR.** |
| Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) and explain methodological inconsistencies with the Party's most recent national inventory report, if applicable (para. 76(c) of the MPGs) | **The GHG inventory of the EU is the primary source for the GHG data used for accounting. The share of GHG inventory emissions from international aviation and navigation in the scope of the NDC have been determined separately based on JRC-IDEES data, using emission factors and methodologies consistent with IPCC guidance. There are no methodological inconsistencies with the most recent national inventory report.** |
| *For Parties that apply technical changes to update reference points, reference levels or projections, the changes should reflect either of the following (para. 2(d) of annex II to decision 4/CMA.1):* | |
| Technical changes related to technical corrections to the Party's inventory (para. 2(d)(i) of annex II to decision 4/CMA.1) | **No technical changes related to technical corrections to the GHG inventory were applied to update reference points, reference levels or projections.** |
| Technical changes related to improvements in accuracy that maintain methodological consistency (para. 2(d)(ii) of annex II to decision 4/CMA.1) | **No technical changes related to improvements in accuracy were applied to update reference points, reference levels or projections.** |
| Explain how any methodological changes and technical updates made during the implementation of their NDC were transparently reported (para. 2(e) of annex II to decision 4/CMA.1) | **Methodological changes and technical updates are reported in the chapter entitled 'recalculations and improvements' of the National Inventory Document of the EU.**<br>**GHG emissions from international aviation and navigation in the scope of the EU NDC are reported for the first time in this BTR (see Annex 2 to the BTR).** |
| *Striving to include all categories of anthropogenic emissions or removals in the NDC and, once a source, sink or activity is included, continuing to include it (para. 3 of annex II to decision 4/CMA.1):* | |
| Explain how all categories of anthropogenic emissions and removals corresponding to their NDC were accounted for (para. 3(a) of annex II to decision 4/CMA.1) | **The indicator used for tracking progress towards implementing and achieving the NDC target comprises all categories of anthropogenic emissions and removals corresponding to the NDC.** |
| Explain how Party is striving to include all categories of anthropogenic emissions and removals in its NDC, and, once a source, sink or activity is included, continue to include it (para. 3(b) of annex II to decision 4/CMA.1) | **The scope of the NDC of the EU covers all categories of emissions and removals reported in the GHG inventory, in line with IPCC guidelines. Member States report some specific source categories as 'not estimated' when the estimates would be insignificant as defined in paragraph 32 of the annex to decision 18/CMA.1. Information on these categories is provided in Common Reporting Table 9 of the respective Member States' GHG inventory submission.**<br>**Besides including all sectors listed in decision 18/CMA.1, a share of emissions from international aviation and navigation are also included in the NDC scope.** |
| Provide an explanation of why any categories of anthropogenic emissions or removals are excluded (para. 4 of annex II to decision 4/CMA.1) | **All categories of anthropogenic emissions and removals contained in the national total of the EU GHG inventory are included in the NDC.** |

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| *Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of its NDC* | |
| Provide information on any methodologies associated with any cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 (para. 75(f) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA, when applicable.** |
| Provide information on how each cooperative approach promotes sustainable development, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA, when applicable.** |
| Provide information on how each cooperative approach ensures environmental integrity consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA, when applicable.** |
| Provide information on how each cooperative approach ensures transparency, including in governance, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA, when applicable.** |
| Provide information on how each cooperative approach applies robust accounting to ensure, inter alia, the avoidance of double counting, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA, when applicable, when applicable.** |
| Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA, when applicable.** |

*Notes*: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs.

[a] For the first NDC under Article 4, each Party shall clearly indicate and report its accounting approach, including how it is consistent with Article 4, paras. 13–14, of the Paris Agreement (para. 71 of the MPGs).

[b] For the second and subsequent NDC under Article 4, each Party shall provide information referred to in chapter III.B and C of the MPGs consistent with decision 4/CMA.1. Each Party shall clearly indicate how its reporting is consistent with decision 4/CMA.1 (para. 72 of the MPGs). Each Party may choose to provide information on accounting of its first NDC consistent with decision 4/CMA.1 (para. 71 of the MPGs).

## 4. Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreement[a]

| | Unit, as applicable | Reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate (paras. 67 and 77(a)(i) of the MPGs) | Implementation period of the NDC covering information for previous reporting years, as applicable, and the most recent year, including the end year or end of period (paras. 68 and 77(a)(ii–iii) of the MPGs) | | Target level[b] | Target year or period | Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs) |
|---|---|---|---|---|---|---|---|
| | | | **2021** | **2022** | | | |
| Indicator(s) selected to track progress of the NDC or portion of NDC under Article 4 of the Paris Agreement (paras. 65 and 77(a) of the MPGs): | | | | | | | |
| **Annual total GHG emissions and removals consistent with the scope of the NDC** | **kt $CO_2$eq[126]** | **4 699 405** | **3 272 650** | **3 205 223** | **(at least 55% below base year level)** | **2030** | **The most recent level of the indicator is** 31.8 **% below the base year level.** |
| Where applicable, total GHG emissions and removals consistent with the coverage of the NDC (para. 77(b) of the MPGs) | **kt $CO_2$eq** | **4 699 405** | **3 272 650** | **3 205 223** | | | |
| Contribution from the LULUCF sector for each year of the target period or target year, if not included in the inventory time series of total net GHG emissions and removals, as applicable (para. 77(c) of the MPGs) | **NA** | | **NA** | **NA** | | | |
| Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of the NDC, shall provide (para. 77(d) of the MPGs): | | | | | | | |
| If applicable, an indicative multi-year emissions trajectory, trajectories or budget for its NDC implementation period (para. 7(a)(i), annex to decision 2/CMA.3) | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |

[126] Net GHG emissions in the scope of the NDC

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| If applicable, multi-year emissions trajectory, trajectories or budget for its NDC implementation period that is consistent with the NDC (para. 7(b), annex to decision 2/CMA.3) | **NA** | | **NA** | **NA** | | | |
| Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the emission or sink categories as identified by the host Party pursuant to paragraph 10 of annex to decision 2/CMA.3 (para. 23(a), annex to decision 2/CMA.3) (as part of para. 77 (d)(i) of the MPGs) | **kt $CO_2$eq** | | **3 272 650** | **3 205 223** | | | |
| Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the portion of its NDC in accordance with paragraph 10, annex to decision 2/CMA.3 (para. 23(b), annex to decision 2/CMA.3) | **kt $CO_2$eq** | | **3 272 650** | **3 205 223** | | | |
| If applicable, annual level of the relevant non-GHG indicator that is being used by the Party to track progress towards the implementation and achievement of its NDC and was selected pursuant to paragraph 65, annex to decision 18/CMA.1 (para. 23(i), annex, decision 2/CMA.3) | **NA** | | **NA** | **NA** | | | |
| Annual quantity of ITMOs first transferred (para. 23(c), annex to decision 2/CMA.3) (para. 77(d)(ii) of the MPGs) | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |
| Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcomes, as appropriate (para. 23(d), annex to decision 2/CMA.3) (para. 77(d)(ii) of the MPGs) | **NA** | | **NA** | **NA** | | | |
| Annual quantity of ITMOs used towards achievement of the NDC (para. 23(e), annex to decision 2/CMA.3) (para. 77(d)(ii) of the MPGs) | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |
| Net annual quantity of ITMOs resulting from paras. 23(c)-(e), annex to decision 2/CMA.3 (para. 23(f), annex to decision 2/CMA.3) | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |
| If applicable, the cumulative amount of ITMOs, divided by the number of elapsed years in the NDC implementation period (para. 7(a)(ii), annex to decision 2/CMA.3) | **NA** | | **NA** | **NA** | | | |
| Total quantitative corresponding adjustments used to calculate the emissions balance referred to in para. 23(k)(i), annex to decision 2/CMA.3, in accordance with the Party's method for applying corresponding adjustments consistent with section III.B, annex to decision 2/CMA.3 (Application of | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| corresponding adjustments) (para. 23(g), annex to decision 2/CMA.3) | | | | | | | |
| The cumulative information in respect of the annual information in para. 23(f), annex to decision 2/CMA.3, as applicable (para. 23(h), annex to decision 2/CMA.3) | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |
| For metrics in tonnes of CO2 eq. or non-GHG, an annual emissions balance consistent with chapter III.B (Application of corresponding adjustment), annex, decision 2/CMA.3 (para. 23(k)(i), annex to decision 2/CMA.3) (as part of para. 77 (d)(ii) of the MPGs) | **kt $CO_2$eq** | | **To be reported in subsequent BTR** | **To be reported in subsequent BTR** | | | |
| For metrics in non-GHG, for each non-GHG metric determined by participating Parties, annual adjustments resulting in an annual adjusted indicator, consistent with para. 9 of chapter III.B (Corresponding adjustments), annex to decision 2/CMA.3, and future guidance to be adopted by the CMA (para. 23(k)(ii), annex to decision 2/CMA.3) | **NA** | | **NA** | **NA** | | | |
| Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs) | **The EU will account and report for its cooperation with other Parties in a manner consistent with the guidance adopted by CMA1 and any further guidance agreed by the CMA in a subsequent BTR or initial report, when applicable.** | | | | | | |

***Table 29***

*Notes*: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional selected indicator.

*a* This table could be used for each NDC target in case Party's NDC has multiple targets.

*b* Parties may provide information on conditional targets in a documentation box with references to the relevant page in their biennial transparency report.

**The section 'Assessment of the achievement of the Party's NDC' of CTF table 4 is not included here because it applies after the end of the BTR period only, and the CTF reporting tool does not allow filling in this information at this point in time.**

# Annex 2: Methodology applied for the identification of GHG emissions from international aviation and navigation in the scope of the EU NDC

The scope of the EU NDC goes beyond national GHG emissions and removals in the scope of the national GHG inventory; it also includes specific emissions from international aviation and navigation. This annex describes the methodology for identifying these emissions.

International aviation and maritime emissions are estimated by using the Joint Research Centre's Integrated Database of the European Energy System (JRC-IDEES).[127] It allows to split the international transport CO2 emissions into intraEU/extraEU and intraEEA/extraEEA and the departing flights from the EU to the UK and Switzerland, categories backwards in time (i.e. 1990) (i.e. for the time period back to 1990).[128]

For international transport, JRC-IDEES applies a decomposition methodology that reconciles the scopes of available primary statistics and harmonises historical data on international aviation and maritime emissions, energy use, and transport activity. The resulting annual dataset covers 1990-2021 and distinguishes domestic, intra-EU/intra-EEA, and extra-EU/extra-EEA activity for each EU Member State, Norway and Iceland.

In aviation, JRC-IDEES distinguishes passenger and freight modes, with three geographical categories of flight origin/destinations for each mode: domestic, intra-EEA + UK, and extra-EEA + UK. Intra-EU, the UK, and EEA[129] categories are also used internally during calibration but aggregated for reporting. For each mode/category combination, JRC-IDEES estimates activity (as passenger-km or tonnes-km), energy use and $CO_2$ emissions, aircraft stock (expressed as representative aircraft), load factors, and aircraft efficiencies. As country-specific activity statistics are not available, the decomposition first allocates EU-level activity data from the Transport Pocketbook[130] of the European Commission's Directorate-General for Mobility and Transport to each country and flight category.

For passenger modes, this allocation calculates average load factors using Eurostat data on total passengers and flights. These load factors and total flight numbers are combined with average flight distances from EUROCONTROL, the pan-European organisation dedicated to air traffic management, to yield an initial estimate for passenger transport activity. For intra-EU activity, a uniform scaling factor is then applied across Member States to match total EU-level Transport Pocketbook data. Freight activity follows a similar process, using a 'representative flight' concept with a common load factor across all Member States to account for mixed passenger-freight flights.

Next, the decomposition estimates fuel use from EUROCONTROL data, by deriving a distance-dependent average aircraft efficiency, then applying it to the country-specific ensemble of flights and routes. The final step scales the estimates to meet Eurostat energy balances for total domestic and international consumption back to 1990 values, maintaining intra-EEA/extra-EEA fuel use ratios derived from EUROCONTROL. JRC-IDEES additionally reports resulting differences with submissions by Parties to the UNFCCC. The above process is followed throughout the entire decomposition period (1990-2021). Data gaps are estimated from the existing indicators as follows:

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[127] European Commission, Joint Research Centre, Rózsai, M., Jaxa-Rozen, M., Salvucci, R., Sikora, P., Tattini, J. and Neuwahl, F., JRC-IDEES-2021: the Integrated Database of the European Energy System – Data update and technical documentation, Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/614599.

[128] The JRC-IDEES analytical database is designed to support energy modelling and policy analysis, by combining primary statistics with technical assumptions to compile detailed energy-economy-emissions historical data for each key energy sector. For aviation, EEA emissions includes emissions related to the UK but not to Switzerland, where total $CO_2$ emissions for the scope are additionally estimated from EUROCONTROL data.

[129] In this annex, EEA stands for European Economic Area, which comprises the 27 EU Member States, Iceland, Liechtenstein and Norway.

[130] Statistical pocketbook 2023, https://transport.ec.europa.eu/facts-funding/studies-data/eu-transport-figures-statistical-pocketbook/statistical-pocketbook-2023_en.

- The process iterates backwards towards 1990, starting from the oldest years in which data is available in each Member State.
- Average flight distance is kept constant for early years without EUROCONTROL data (generally before 2004).
- If the load factor (passengers per flight) cannot be calculated due to a lack of passenger and/or flight data, it is estimated from the trend of the existing time series.
- Missing numbers of flights are calculated from the load factor and the passengers carried.
- If no passenger data is available, the total mileage is estimated from the energy consumption, and combined with average flight distance to estimate the number of flights. The number of flights is then combined with the load factor to estimate the total passengers carried.
- For early years without data, constant values are assumed for the factors used to *i)* scale intra-EU activity to the Transport Pocketbook, *ii)* adjust the estimated fuel use to EUROCONTROL data for specific routes, and *iii)* scale this adjusted fuel use to Eurostat energy balances (e.g. before 1995 for Transport Pocketbook data; before 2004 for EUROCONTROL data).

  For international maritime transport, JRC-IDEES estimates data both for intra-EU/extra-EU and intra-EEA/extra-EEA geographical categories. The emission estimates in the GHG inventory already include $CO_2$, $CH_4$, and $N_2O$ gases. Transport activity (tonnes-km) is estimated from Eurostat data on gross weight of transported goods, using port-level and country-level data for intra-EU and extra-EU categories, respectively. Intra-EU activities are then scaled to match the Transport Pocketbook totals, accounting for domestic coastal shipping (calibrated separately in JRC-IDEES). Next, transport activity is combined with data reported under the monitoring, reporting and verification system for maritime transport under the EU ETS ('THETIS MRV'[131]), namely EU-level mileage data and country-specific vessel sizes to estimate load factors (tonnes per movement). The load factors and resulting annual mileage (km) are calibrated to meet EU-level THETIS MRV mileage. The annual mileage is in turn combined with THETIS MRV average efficiency to yield a total technical energy consumption, with corresponding emissions derived from default emissions factors. This energy consumption is scaled to Eurostat energy balances so as to minimise discrepancy to total intra-EU THETIS MRV emissions. As with aviation, JRC-IDEES reports corresponding differences to submissions under the UNFCCC. Early years with data gaps are estimated from existing indicators as follows:

  - The process iterates backwards towards 1990, starting from the oldest years in which data is available in each Member State.
  - Average distance of voyages is kept constant for early years without Eurostat activity data (generally before 1997-2000).
  - If the load factor (tonnes per movement) cannot be estimated due a lack of activity data, it is kept constant.
  - If activity data is not available, it is estimated from Eurostat energy consumption.
  - Missing mileage data is derived from the activity and load factor estimates.
  - For early years without data, constant values are assumed for the factors used to i) scale intra-EU activity to the Transport Pocketbook, ii) scale estimated mileage to meet EU-level

[131] THETIS MRV, https://mrv.emsa.europa.eu/#public/eumrv.

THETIS MRV mileage, and iii) scale domestic and intra-EU $CO_2$ emissions estimated from energy consumption so as to match total THETIS MRV $CO_2$ emissions.

- Finally, the ratios between the estimated MRV emissions and the $CO_2$ emissions for the reported transport activity (for intra-EU/EEA and extra-EU/EEA categories) between 2018 and 2021 are used to calculate the MRV compliant estimates back to 1990 levels.

For the year 2022, the international navigation and aviation emissions under the EU NDC scope have been estimated by applying the same share of those emissions on the total international navigation and aviation emissions (as reported in the GHG inventory) as in 2021.

| **Emissions** | **Domestic aviation** | | **Intra-EEA aviation** | | | **Extra-EEA aviation** |
|---|---|---|---|---|---|---|
| **Current NDC commitment** | Domestic EU flights (e.g. Palermo Milan | Domestic "non-EU EEA" flights (e.g. Oslo to Bergen) | Flights between "non-EU EEA" countries (from Oslo to Reykjavik) | Flights within the EEA, departing from EU airports | Flights to/from EU airports to OMRs | Departing flights from EU airports to UK and Switzerland |
| **Current NDC commitment** | Yes | No | No | Yes | Yes From Jan 2024 | Yes |

***Table 30: Aviation emissions covered by the EU NDC scope***

| **Emissions** | **Domestic maritime navigation** | | **International maritime navigation** | | | | **International maritime navigation** | |
|---|---|---|---|---|---|---|---|---|
| | Domestic EU flights (e.g. Palermo Milan | Voyages within NO/IS (e.g. Oslo - Bergen | Voyages between two EU MS (e.g. Valencia - Rotterdam ) ) | Voyages between a MS and NO/IS (e.g. Rotterdam - Oslo) | Voyages between an EU MS and a third country | Voyages between NO/IS and a third country (or IS/NO) | Emissions within a port of an EU MS (reported under domestic emissions ) | Emissions within a port of NO or IS (or another third country) |
| **Current NDC commitment** ($CO_2$; $CH_4$; $N_2O$) | Yes | No | Yes | No | No | No | Yes | No |

***Table 31: Maritime navigation emissions covered by the EU NDC***

REPUBLIC OF SLOVENIA
**MINISTRY OF THE ENVIRONMENT, CLIMATE AND ENERGY**