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Accompanying the document

Report from the Commission

The European Union Second Biennial Transparency Report under the Paris Agreement and Ninth National Communication under the United Nations Framework Convention on Climate Change

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Abbreviations

Abbreviation	Definition
ACA-MED	Advancing Climate Adaptation in the Southern Mediterranean
ACC	Climate Change Adaptation through Watershed, Forest and Disaster-Risk Management and Governance
ACP	African, Caribbean and Pacific
ACE	Action for Climate Empowerment
AECID	Spanish Agency for International Development Cooperation
AFIR	Alternative Fuels Infrastructure Regulation
AFSHS	Africa Fertiliser and Soil Health Summit
AR6	IPCC's Sixth Assessment Report
BSRP	Building Safety and Resilience in the Pacific Phase
BTR	Biennial Transparency Report
BTR2	European Union's second Biennial Transparency Report
C3S	Copernicus Climate Change Service
CAMS	Copernicus Atmosphere Monitoring Service
CAPR	Climate Action Progress Report
CBAM	Carbon Border Adjustment Mechanism
CCS	Consortium of insurance
CDD	Cooling degree days
CDP	Italian National Promotional Institution
CDSE	Copernicus Data Space Ecosystem
CEMS	Copernicus Emergency Management Service
CH4	Methane
CID	Clean Industrial Deal
Climate-ADAPT	Climate Adaptation Platform
CMA	Meeting of the Parties to the Paris Agreement
CO_2	Cabon dioxide
CO_2-eq	Carbon dioxide equivalent
CO2M	Copernicus CO2 monitoring mission
COM	European Commission communication/document identifier
CoM	Covenant of Mayors
COP	Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
COST	European Cooperation in Science and Technology
CRAFT	Climate Resilience and Adaptation Finance and Technology Transfer Facility
CRT	Common Reporting Tables
CTCN	Climate Technology Centre and Network
CTF	Common tabular format
DAC	Development Assistance Committee
DeSIRA	Development of Smart Innovation through Research in Agriculture
DeSIRA-LIFT	DeSIRA – Leveraging the Impact of Food Security and Nutrition
DG	Directorate-General
DG INTPA	Directorate-General for International Partnerships
EAP	Environment Action Programme

EaP	Eastern Partnership
EBRD	European Bank for Reconstruction and Development
ECMWF	European Centre for Medium-Range Weather Forecasts
EDFIs	European development finance institutions
EEA	European Environment Agency
EED	Energy Efficiency Directive
EFSD	Environment Fund for Sustainable Development
EIB	European Investment Bank
EIGE	European Institute for Gender Equality
EIONET	European Environment Information and Observation Network
EIT	European Institute of Innovation and Technology
EMODnet	European Marine Observation and Data Network
EMSO	European Multidisciplinary Seafloor and water-column Observatory
EPALE	Electronic Platform for Adult Learning in Europe
EPBD	Energy Performance of Buildings Directive
ERA	European Research Area
ERA5	Fifth generation European climate reanalysis dataset
ERA6	Sixth generation European climate reanalysis dataset
ERA-NET	European Research Area Network
ERCC	Emergency Response Coordination Centre
ERIC	European Research Infrastructure Consortium
ESEP	European School Education Platform
ESM	Earth system model
ESOTC	European State of the Climate report
ESR	Effort Sharing Regulation
ETC/CCA	European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation
ETS	Emissions Trading System
EU	European Union
EUCDs2	EU Climate Dialogues 2
EUCRA	European Climate Risk Assessment
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EuroGOOS	European Global Ocean Observing System
EUR	Euro
EV	Electric vehicle
FAIR	Findable, accessible, interoperable and reusable
F-gases	Fluorinated greenhouse gases
FMO	Dutch Entrepreneurial Development Bank
FO-RI	Farmers Organisations Leading Research and Innovation on Agroecology for Sustainable Food Systems
GAP	Gender Action Plan
GCOS	Global Climate Observing System
GDP	Gross domestic product
GGBI	Global Green Bond Initiative
GHG	Greenhouse gas
GHG_E	Greenhouse gas emissions from energy fuel combustion
GIZ	German Agency for International Cooperation

GOOS	Global Ocean Observing System
GREENA	Gender-responsive evaluation for an environmental and sustainable future for all
GVA	Gross Value Added
GWP	Global-warming-potential
HDD	Heating degree days
HDVs	Heavy-duty vehicles
HFCs	Hydrofluorocarbons
ICOS	Integrated Carbon Observation System
ICS	Innovative Climate Solutions
IDEES	Integrated Database of the European Energy System
IDFC	International Development Finance Club
INERA	Environment and Agricultural Research Institute in Burkina Faso
IOC	Intergovernmental Oceanographic Commission
IORPs	Institutions for occupational retirement provisions
IPA	Instrument for Pre-Accession Assistance
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
IRSAT	Institute for Research in Applied Sciences and Technologies in Burkina Faso
ISO	International Organisation Standardisation
JETPs	Just Energy Transition Partnerships
JPI	Joint Programming Initiative
JRC	Joint Research Centre
JTF	Just Transition Fund
KICs	Knowledge and Innovation Communities
LAC	Latin America and Caribbean region
LDCs	Least developed countries
LIFE	Programme for Environment and Climate Action
LT-LEDS	Long-term low greenhouse gas emission development strategies
LULUCF	Land use, land-use change and forestry
MDB	Multilateral development bank
MEL	Monitoring, evaluation and learning
MIPs	Multiannual Indicative Programmes
MRV	Monitoring, reporting, and verification
$MtCO_2$-eq	Million tonnes of carbon dioxide equivalent
N2O	Nitrous oxide
NC9	Ninth National Communication
NDC	Nationally Determined Contribution
NDICI	Neighbourhood, Development and International Cooperation Instrument
NECPs	National Energy and Climate Plans
NF3	Nitrogen trifluoride
NGOs	Non-governmental organisations
NUTS	Nomenclature of Territorial Units for Statistics
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OOF	Other Official Flows
PCD	Policy coherence for development

PEC	Primary Energy Consumption
PESETA	Projection of Economic impacts of climate change in sectors of the EU
PFCs	Perfluorocarbons
PISA	Programme for International Student Assessment
POP	Population
PRIMES	Price-Induced Market Equilibrium System
QA/QC	Quality assurance and quality control
RED	EU Renewable Energy Directive
REGILIENCE+	Regional Pathways to Climate Resilience
RFNBO	Wholesale price hydrogen
RRF	Recovery and Resilience Facility
RRP	Recovery and Resilience Plan
SACE	Italian Export Credit Agency
SAF	Sustainable aviation fuel
SBI	Subsidiary body of implementation
SDG	Sustainability Development Goal
SEACAPs	Sustainable energy access and climate action plans
SF6	Sulphur hexafluoride
SFIC	Strategic Forum for International Scientific and Technological Cooperation
SIDS	Small island developing states
SIOS	Svalbard Integrated Arctic Earth Observing System
STEM	Science, technology, engineering and mathematics
SWD	Staff Working Document
TAIEX	Technical Assistance and Information Exchange
TCX	Currency Exchange Fund
TEC	Technical Executive Committee
TEI	Team Europe Initiative
TEN-T	Trans-European Transport Network
TRATOLOW	Transition towards a low-emission and climate-resilient economy in the Western Balkans and Türkiye
UCPM	Union Civil Protection Mechanism
UN	United Nations
UNCCD	UN Convention to Combat Desertification
UNDP	UN Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
VET	Vocational education and training
WAM	With additional measures
WEM	With existing measures
WMO	World Meteorological Organization

1 Introduction and executive summary

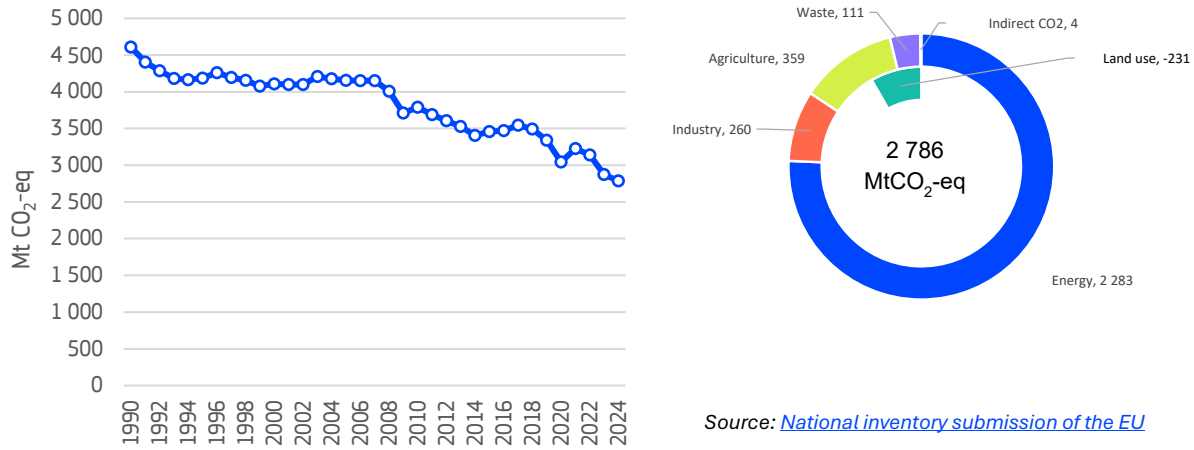
This Staff Working Document (SWD) and the Report from the Commission 'The European Union Second Biennial Transparency Report under the Paris Agreement and Ninth National Communication under the United Nations Framework Convention on Climate Change', together constitute the European Union's second Biennial Transparency Report (BTR2) and its ninth National Communication (NC9) to be submitted to the United Nations Framework Convention on Climate Change secretariat as a single document. The Commission has prepared this report based on the guidelines adopted by the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement, and Article 7 paragraph 2 of the Kyoto Protocol, conclusions of the UNFCCC lead reviewers' meetings and Article 29.5(a) of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.[1]

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

2 National inventory report

Total net GHG emissions, including LULUCF, fell by 87 $MtCO_2$-eq, or 3%, between 2023 and 2024, reaching 2 786 $MtCO_2$-eq in 2024. Compared with 1990, emissions were 39.5% lower in 2024 (see Figure 1, left). This follows the strong performance in 2023, when the EU recorded one of its largest relative and absolute reductions in greenhouse gas (GHG) emissions since 1990. Emissions continued to fall in 2024.

Figure 1: Development of GHG net emissions 1990-2024 (left), and shares of GHG emissions and removals by sector in 2024 (right)



Source: National inventory submission of the EU

In 2024, the energy sector was by far the largest source of EU GHG emissions, generating 2 283 $MtCO_2$-eq. It accounted for most of the total emissions (see Figure 1, right). The second largest source was agriculture, with 359 $MtCO_2$-eq, followed by industrial processes and product use, with 260 $MtCO_2$-eq. Waste contributed 111 $MtCO_2$-eq. LULUCF acted as a net sink of greenhouse gas emissions, with a negative value of -231 $MtCO_2$-eq. This means that, overall, this sector removed more CO_2 from the atmosphere than it emitted.

The largest reduction between 2023 and 2024 came from the energy sector, especially public electricity and heat production, where emissions fell by more than 9%, corresponding to 53 $MtCO_2$-eq. This was due mainly to a strong reduction in coal use and, to a lesser extent, natural gas use. Renewable electricity accounted for 47% of net electricity generation in the EU in 2024, mainly thanks to wind, solar and hydropower.

Several other parts of the economy also helped reduce emissions in 2024 compared with 2023. Emissions from cropland decreased by 15 $MtCO_2$-eq. Emissions from manufacturing industries, excluding iron and steel, fell by 7 $MtCO_2$-eq. Emissions from residential fuel use (mainly fuels used for heating homes) decreased by 5 $MtCO_2$-eq. Net removals from forest land also increased slightly by 3 $MtCO_2$-eq.

Some emissions increased in 2024 compared with 2023. The largest increase was in road transport, where emissions rose by 9 $MtCO_2$-eq. Net emissions from grassland also increased by 4 $MtCO_2$-eq.

The EU, as a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, reports its GHG inventory every year.

The inventory covers emissions and removals in the EU from 1990 to two years before the current year (t-2).

This report uses data consistent with the EU GHG inventory submitted in 2026. The National Inventory Document, which the EU submits as a separate document, provides further details.

3 Information necessary to track progress

3.1 National circumstances and institutional arrangements

3.1.1 National circumstances

The EU's NDC is implemented on the basis of the specific circumstances of the EU and of each Member State (such as its state of economic development). This section provides an overview of the national circumstances that affect progress in implementing and achieving the EU's NDC.

As the EU's NDC consists of an economy-wide greenhouse gas (GHG) net emissions reduction target, developments in the larger emitting sectors are particularly significant. The decarbonisation of the energy sector, as described in the following sections, plays a key role in reducing GHG emissions and in implementing and achieving the EU's NDC.

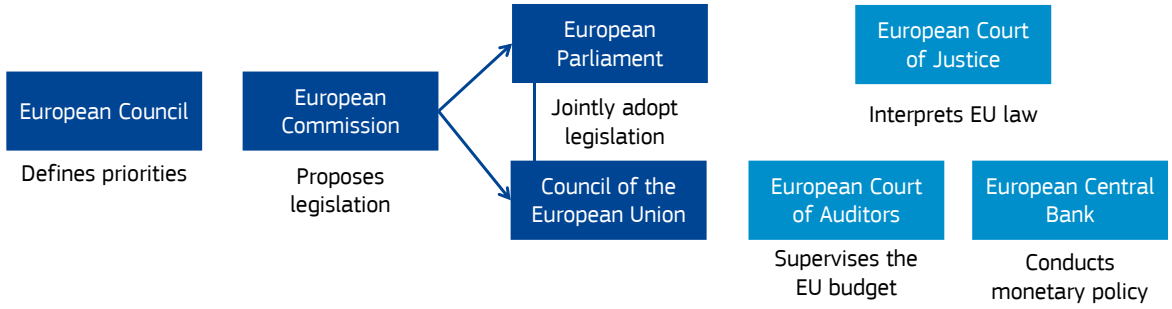
Government structure

The European Union is composed of 27 Member States[2]. All EU actions are grounded in treaties that have been jointly agreed and ratified by the Member States. These treaties define the EU's powers and set out which powers are exercised at EU level, and which remain with the Member States. Within these areas of competence, EU institutions adopt legislation, which is then implemented by the Member States in accordance with national procedures. In the energy and the environment sectors, responsibilities are shared between the EU and the Member States.

The main institutions involved in EU decision-making are the **European Parliament**, the **Council of the European Union**, and the **European Commission**. Together, they ensure democratic representation, intergovernmental coordination and executive implementation across the EU.

[2] 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 and Sweden.

Figure 2: Institutions of the European Union



Source: Types of EU institutions, bodies and agencies

The **European Parliament** represents the citizens of EU countries, who elect the members of the European Parliament every five years. The Parliament debates, amends and adopts EU laws together with the Council of the European Union; a process known as the ordinary legislative procedure. The Parliament also plays a key role in approving the EU budget and overseeing the activities of the European Commission.

The **European Council** is composed of the Heads of State or Government of the EU Member States who have been elected by the citizens through national elections. It sets the EU's overall political direction and priorities but does not adopt legislation. The European Council provides high-level guidance, particularly on matters of strategic importance such as climate policy, energy security or international relations.

The **Council of the European Union,** often referred to simply as *the Council*, represents the governments of the EU Member States. It is a key decision-making body where national ministers meet to discuss, amend and adopt legislative proposals, usually in coordination with the European Parliament. The Council operates in different configurations depending on the policy area, for example, meetings of environment and climate ministers address climate and energy legislation. Decisions within the Council generally require either unanimity or a qualified majority, depending on the subject matter, ensuring that EU Member States retain a decisive voice in EU policymaking.

The **European Commission** acts as the EU's executive arm. It has the exclusive right to propose new laws, which are then examined and adopted by the European Parliament and the Council. Before submitting proposals, the Commission undertakes public consultations and prepares impact assessments to evaluate policy options. These processes include contributions from national authorities, civil society and expert groups[3]. Once legislation is adopted, the Commission monitors and supports its implementation, ensuring that EU Member States apply EU law correctly and initiating infringement procedures when necessary. The European Commission also manages EU programmes and the EU budget.

The work of these main EU institutions is complemented by other bodies with specialised functions. The **Court of Justice of the European Union** ensures the uniform interpretation and application of EU law**,** the **European Central Bank** manages the EU's

[3] How EU policy is decided.

monetary policy for countries in the euro area and the **European Court of Auditors** oversees the sound financial management of the EU budget.

Together, these institutions ensure that the European Union functions as a partnership between supranational and national actors. This partnership combines collective decision-making process at EU level with Member States' active participation in the process and responsibility for implementing the resulting decisions.'.

Population profile

The EU has a large and relatively stable population. In 2025, the EU's population was 450 million people, having grown moderately by around 8% since 1990. According to projections from Eurostat, the population is expected to peak around 2030 and then gradually decline to around 448 million people by 2050.

The EU is urbanised, with around 75% of the population living in urban areas. Urbanisation affects emissions through changes in mobility patterns, housing and energy use. Dense urban areas can reduce transport emissions due to shorter travel distances and greater use of public transport. At the same time, urban lifestyles can increase demand for goods and services, which can raise indirect emissions.

Household composition is another important factor. On average, there are 2.3 persons[4] per household in the EU. The size has remained stable over the last 20 years and therefore there has been no additional pressure on energy consumption from increases in household size.

Demographic ageing is a key feature of the EU's population profile. The share of persons aged 65 and over increased from 16.4% in 2004 to 21.6% in 2024 while the share of children under 15 years decreased from 16.2% to 14.6% over the same period[5]. An increasing share of older people can influence emissions through changes in consumption patterns, mobility and energy use. For example, reduced commuting may lower transport emissions, while increased time spent at home may raise residential energy demand.

Geographical profile

The EU covers approximately 4.1 million km^2, spanning a remarkable spectrum of geodiversity and varied ecosystems. Its territory stretches from the Atlantic and Arctic environments of the north-west to the continental, alpine, and Mediterranean zones of central and southern Europe. This ecological diversity is further enriched by the EU's outermost regions across the Atlantic, the Caribbean, South America and the Indian Ocean, which add tropical, subtropical and insular environments to its geographic profile.

The EU's geographical profile is an important determinant of greenhouse gas emissions and removals over time. The wide variation in climate and topography affects energy demand, transport patterns, land use and the distribution of economic activities. Colder

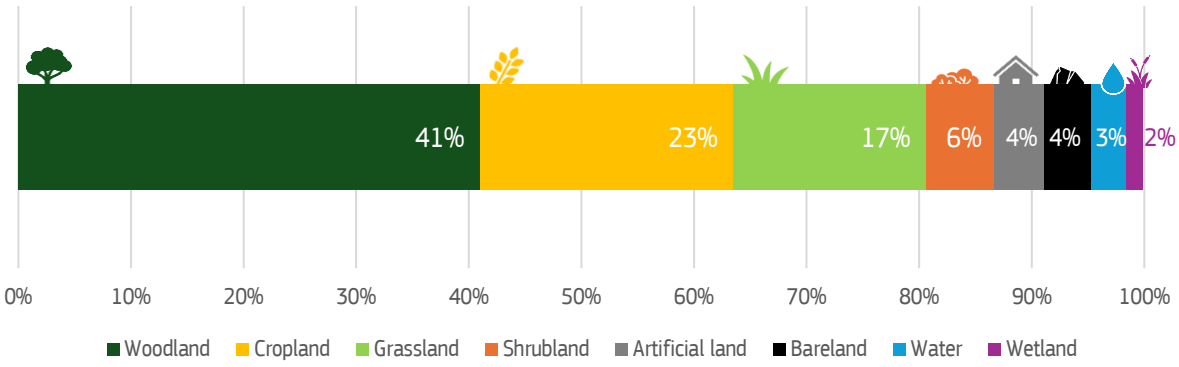
[4] Eurostat, average household size.

[5] Demography of Europe – 2025 edition - Interactive publications – Eurostat, https://ec.europa.eu/eurostat/web/interactive-publications/demography-2025#about-publication.

regions generally require more space heating, while warmer regions face growing cooling demand – both for goods and spaces. Mountains, islands and sparsely populated regions have higher transport needs and infrastructure requirements, while dense lowland areas support more efficient transport and settlement patterns. At the same time, the impacts of climate change differ across regions and may influence emissions and removals in different ways. Southern Europe is increasingly exposed to heat and drought, coastal regions to sea-level rise and flooding, and some northern regions to changing growing conditions and forest dynamics. These regional differences can affect energy demand, agricultural production, risks of natural disturbances and ecosystems' capacity to act as carbon sinks. Together, these factors shape sectoral emission patterns across the EU.

Land cover is a central aspect of the EU's geographical profile. **Forests cover around 41%** of the EU's land area and make a major contribution to net greenhouse gas removals. The EU is one of the few regions of the world where the share of forested area has grown, increasing from 36% in 2009 to 41% in 2022[6]. Cropland and grassland also occupy a large share of the territory, accounting for 23% and 17% respectively, while artificial surfaces remain a smaller, though growing, part of total land cover at around 4%. Changes in land use, including urban expansion and infrastructure development, can reduce the area available for carbon sinks and weaken ecosystem functions, while sustainable land management, bio-diversity friendly afforestation and ecosystem restoration can increase removals.

Figure 3: Land cover in the EU, 2022 (% of total area)



Source: Eurostat. Land cover overview by NUTS 2 regions.

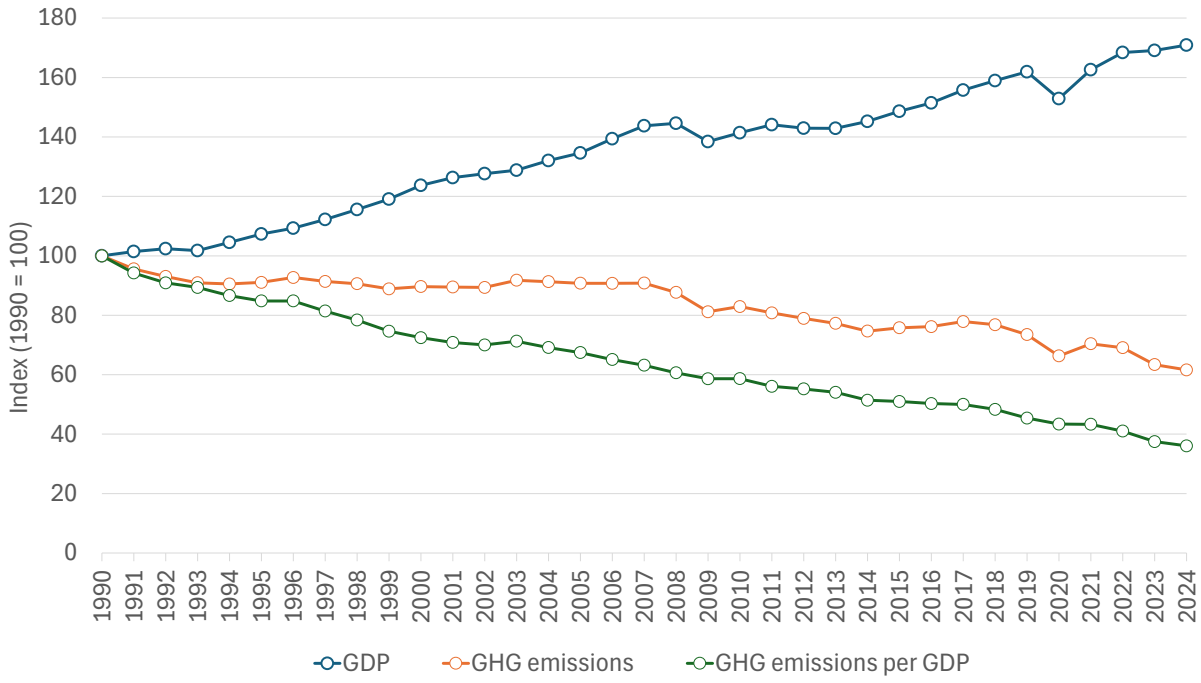
The geographical distribution of land and natural resources also affects the EU's mitigation potential. Different regions have different capacities for renewable energy production, including wind, solar and hydropower, and different constraints related to land availability, water resources and ecosystem protection. Geography therefore influences both current emissions and the pace and shape of the transition to climate neutrality.

[6] Land cover statistics - Statistics Explained - Eurostat, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Land_cover_statistics.

Economic profile

Economic indicators are key to understanding the trends in GHG emissions and the effects of climate change mitigation policies. Real GDP in the EU grew by around 1% in 2024, marking a slow recovery after stagnation in 2023. Since 1990, the EU's real GDP has shown steady growth, reflecting economic resilience and adaptability, particularly in recovering from the global financial crisis of 2009 and the COVID-19 pandemic in 2020. Over the whole period, GHG emissions have seen a significant decline, thanks to policies promoting energy efficiency and renewable energy sources. This continued decoupling of emissions from economic growth demonstrates that climate action and prosperity go hand in hand, strengthening Europe's economic stability and energy security.

Figure 4: Trend in the EU's GDP and GHG emissions



Source: Eurostat, annual EU GHG inventory 2026. Real GDP between 1990 and1995 based on World Bank GDP estimates.

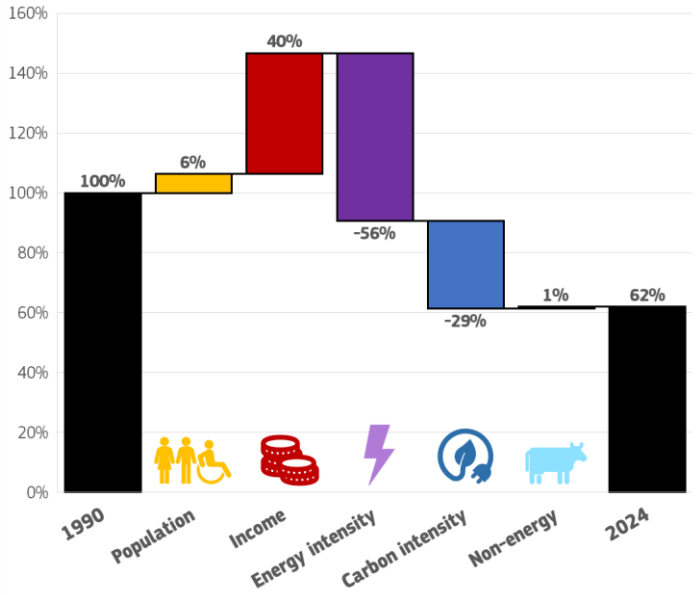
In 2024, emissions were 39.5% lower than in 1990, while GDP was 71% higher, demonstrating the continued decoupling of economic growth from emissions (see Figure 4).

A combination of factors has driven the reduction of total domestic greenhouse gas emissions in the EU since 1990. Figure 8 breaks down this overall change using a decomposition analysis based on an extended Kaya identity, which distinguishes five distinct drivers[7]. The underlying methodology aligns with previous studies, such as those

[7] The Kaya identity is a mathematical identity stating that, in its original version, the total GHG emission level can be expressed as the product of four factors: human population, GDP per capita, energy intensity (per unit of GDP), and carbon intensity (emissions per unit of energy consumed). In this section we further decomposed the identity to distinguish emissions from fuel combustion from other emissions (non-energy effect). Other identities are possible.

by the European Environment Agency[8]. As with all decomposition methods, these effects indicate the drivers' relative contributions rather than establishing direct causality.

Figure 8: Effects on total GHG emissions between 1990-2024 (% of 1990 emissions)



The change in **total GHG emissions (excluding LULUCF)** are attributed to the following decomposition factors:

- Population = **POP**
- Income (GDP per capita) = **GDP/POP**
- Energy intensity of GDP = **PEC/GDP**
- Carbon intensity of energy consumption = **GHG_E/PEC**
- Non-energy effect = **GHG/GHG_E**

Where GDP = Gross Domestic Product, PEC = Primary Energy Consumption, and GHG_E emissions from energy fuel combustion (GHG category 1.A). The non-energy effect is positive if the emissions from fuel combustion declined faster than non-energy related emissions (e.g. agriculture, waste).

Source: Eurostat, annual EU GHG inventory 2026.

Without technological advances in energy efficiency and carbon intensity, i.e. holding all other factors at 1990 levels, the growth in GDP (income effect) and population (population effect) would have led to a substantial increase in emissions.

Economic growth would have caused emissions to increase by 40% and population growth would have caused emissions to increase by another 6%. However, the decrease in primary energy use per unit of output generated (energy intensity effect) alone more than compensated for those growth factors, reducing emissions by 56%.

Compared with 1990, 17% less energy was needed to produce a unit of GDP in 2024. Several key structural changes have contributed to this efficiency gain. They include better energy transformation processes, for example, through electrification. There is also a general shift to the less energy-intensive[9] sectors. The share of energy-intensive industries in total gross value added (GVA) decreased from 2.8% in 1995 to 1.9% in 2023.

The second important driver was the carbon intensity effect (i.e. the emissions from one unit of produced energy), which on its own, reduced emissions by 29%. Fuel switching plays a crucial role here: the share of fossil fuels in electricity and heat production

[8] The methodology of the Logarithm Mean Divisia Index (LMDI) method and the formula itself can be found in the EEA report No 03/2020 on trends and drivers of EU greenhouse gas emissions, https://www.eea.europa.eu/en/analysis/publications/trends-and-drivers-of-eu-ghg.

[9] Intensive energy sectors are defined here as the following NACE (Nomenclature statistique des Activités économiques dans la Communauté Européenne) sectors: manufacture of paper and paper products (NACE 17), manufacture of chemicals and chemical products (NACE 20), manufacture of other non-metallic mineral products (includes cement, concrete, glass, and ceramics) (NACE 23) and manufacture of basic metals (NACE 24).

decreased from 62% in 1990 to 32% in 2024, whereas the share of renewable and nuclear energy increased from 35% in 1990 to 64% in 2024.

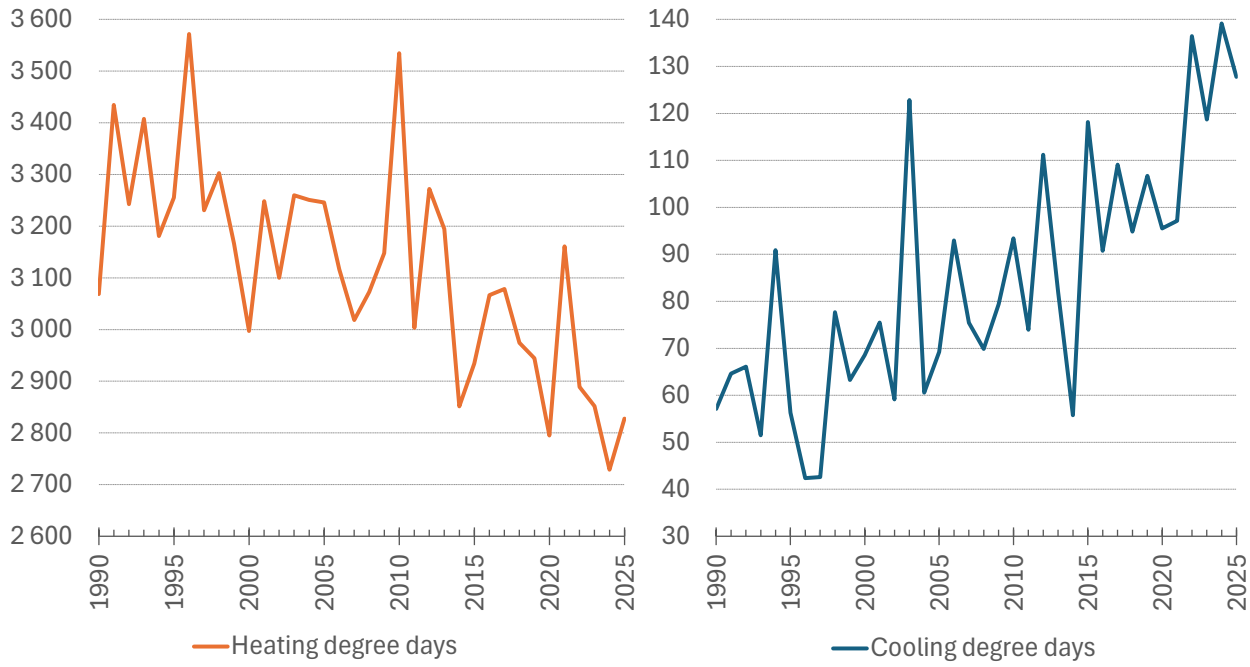
Climate profile

The territory of the EU covers several climatic zones in which economic activities and associated emissions are affected differentially by climatic conditions. In particular, low temperatures in the northern and mountainous regions of the EU – especially in winter – can lead to high heating needs, causing more greenhouse gas emissions than in warmer regions. The opposite pattern is observed for buildings' cooling needs, which can be high in southern regions and remain limited in the EU's northernmost territories.

Heating needs can be measured using heating degree days. This indicator takes the number of days when the average temperature falls below a reference temperature, below which heating is assumed to be needed, and multiplies it by the difference between the average and reference temperatures for each of those days. Cooling needs can be quantified in a similar way, using cooling degree days. This shows the difference between the average temperature and a reference temperature above which cooling is assumed to be needed.

Because of climate change, the number of heating degree days has been decreasing overall in Europe over the last decades, whereas the opposite is true for the number of cooling degree days (see Figure 6).

Figure 6: Time series of heating and cooling degree days



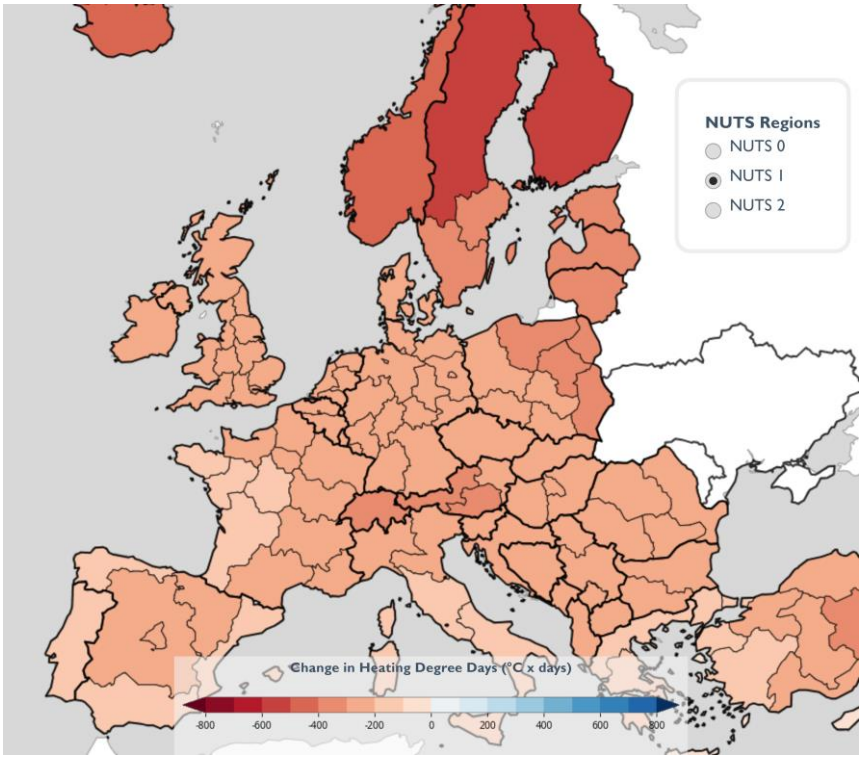
Note: Annual values were calculated by averaging the values of each Nomenclature of Territorial Units for Statistics (NUTS) 3 region.

Source: Analysis based on Eurostat data

These trends are likely to continue in the future, with marked regional variations. Because of projected climate change, the number of heating degree days is expected to decrease mostly in the regions with the coldest climates, which are found in the

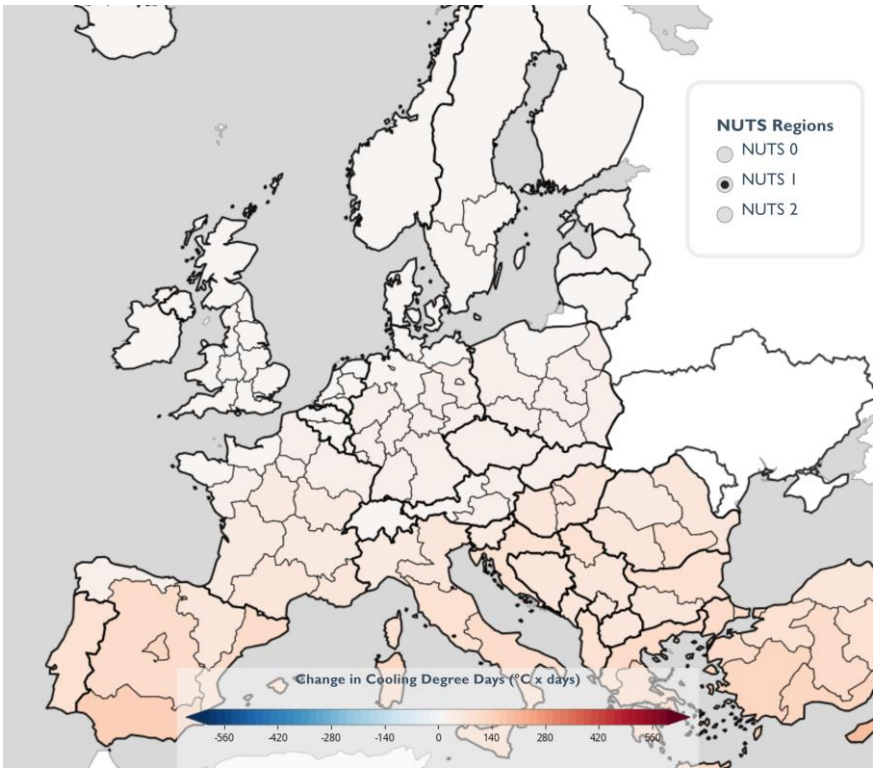
northernmost, eastern and mountainous parts of Europe; see Figure 7. On the other hand, the projected increase in cooling degree days is expected to be highest in the Mediterranean regions (Figure 8). These two phenomena are expected to contribute to a decrease in overall GHG emissions in the EU in winter, but to additional GHG emissions in summer.

Figure 7: Projected change in heating degree days at 2°C of global warming, relative to the 1991–2020 average



Source: European Climate Data Explorer

Figure 8: Projected change in cooling degree days at 2°C of global warming, relative to the 1991–2020 average



Source: European Climate Data Explorer

Climate change affects not only emissions, but also the removal capacity of natural sinks. Changes in climatic conditions have been identified as factors contributing to the decrease in the uptake of carbon from the atmosphere by forests located on EU territory over the last 15 years.

These future changes in climatic conditions will affect natural sinks in several ways. First, higher temperatures speed up the decay processes of carbon stored in soils and dead organic matter, and increase emissions of CO_2. Second, adverse impacts such as windstorms, wildfires and pest outbreaks, which affect forest health negatively, have intensified with climate change. These disturbances also increase CO_2 emissions. Combined with land use, climate change has increased large-scale forest mortality since the 1980s. Projected climate changes will further constrain the capacity of natural sinks and especially forests to take up carbon from the atmosphere.

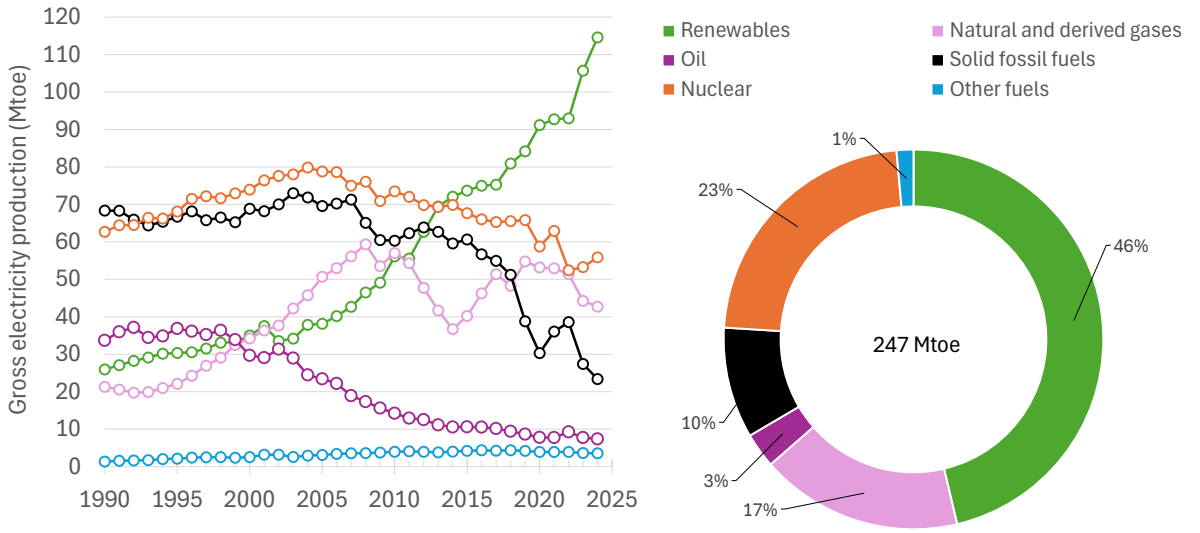
Energy

The energy sector is the largest source of GHG emissions in the EU. It is therefore central to implementing and achieving the EU NDC. The sector comprises all economic activities involved in the extraction, production, conversion, transmission, distribution and supply of energy carriers, including fossil fuels, nuclear energy, electricity, heat and renewable energy sources. Reducing emissions from energy depends on replacing fossil fuels with renewable and low-carbon energy sources, lowering energy demand, improving energy efficiency and electrifying end uses where possible.

Figure 9 shows the change in net GHG emissions from 1990 to 2024 (left), and the contribution of each energy source to total GHG emissions and removals in 2024 (right).

The figure shows that energy production in the EU is spread across a range of different energy sources: solid fuels, natural gas, crude oil, nuclear energy, and renewable energy such as hydropower, wind and solar energy.

Figure 9: Development of electricity production by source 1990-2024 (left), and the shares of energy sources' contribution to total GHG emissions in 2024 (right)



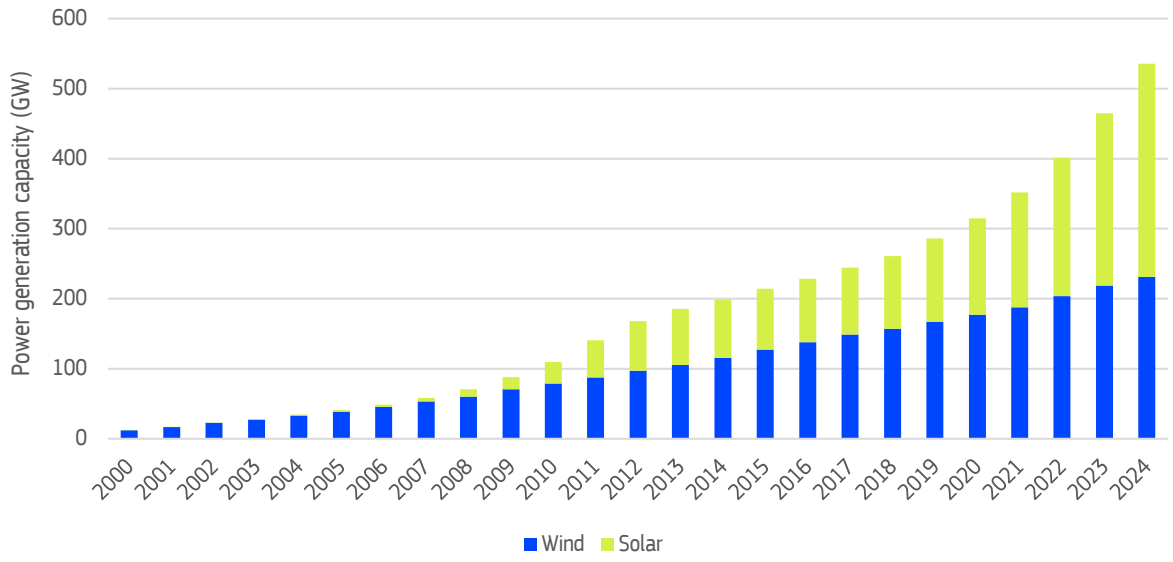
Sources: Eurostat; 2026 GHG inventory submission of the EU

In 2024 in the EU, 23% of the final energy consumed was **electricity,** up from 18% in 1990. The role of electricity differed widely between sectors. It represented around one third of final energy consumption in industry and buildings, but only around 2% in transport.

Electricity came from various sources. In 2024, renewable energy (48%) was the leading source in electricity production, ahead of fossil fuels (28%) and nuclear power (23%). Electricity production from renewable energy sources more than doubled during the last 15 years, while electricity production from solid fossil fuels, oil and nuclear energy decreased over the same period. Natural gas continues to be a significant fuel for electricity generation.

Among renewable sources, the highest share of electricity came from wind turbines (17%), hydropower plants (13%), solar panels (11%) and biofuels (approximately 6%). The installed capacity of wind and solar power has been growing steadily in recent years (see Figure 10). The rapidly falling cost of solar panels led to an annual increase in installed capacity exceeding 20% between 2022 and 2024. There was also a 15% annual increase in wind power capacity over the same period. In 2024, the combined installed capacity of solar and wind power generation was 535 gigawatts, which is approximately 47% of total installed power generation capacity in the EU.

Figure 10: Wind and solar power generation capacity

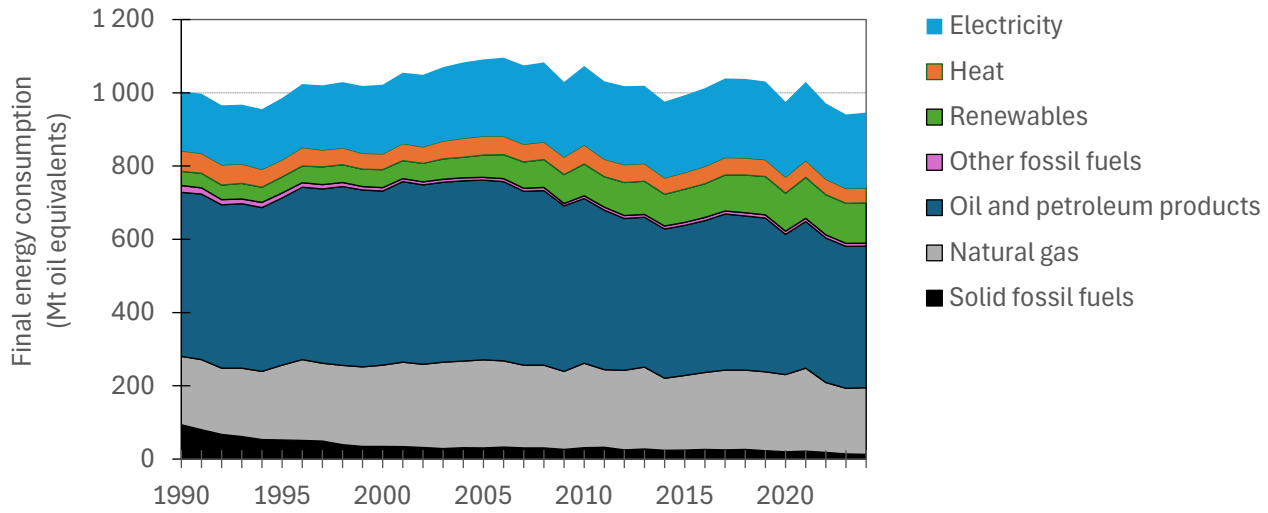


Source: Eurostat

Despite this progress in the use of renewable energy, the **EU still depends on imports of fossil fuels**, especially oil and natural gas. In 2024, the EU's energy imports dependency rate was 57%. This means that nearly 60% of the EU's energy needs were met by net imports. This dependence has implications for both energy security and climate policy. The energy crisis that started in 2021 and intensified in 2022 showed the risks linked to fossil fuel dependence and high energy prices. The conflict in the Middle East in 2026 further exposed these risks. Disruptions to global oil and liquefied natural gas (LNG) supplies pushed up energy prices and increased the EU's fossil fuel import costs. By the end of September 2026, the EU had spent an estimated additional EUR 100 billion on fossil fuel imports since the start of the conflict. These crises have increased the importance of energy savings, energy efficiency and the faster deployment of renewable energy.

Final energy consumption has remained broadly stable over the long term, although it has declined by 12% from its peak in 2006 (see Figure 11). Fossil fuels are still widely used by final consumers, especially in transport, buildings and industry. This means that further emission reductions will depend not only on cleaner electricity generation, but several other factors. Those factors are reducing energy demand, improving energy efficiency, replacing fossil fuels in heating and industrial processes, and increasing the use of clean electricity and renewable fuels.

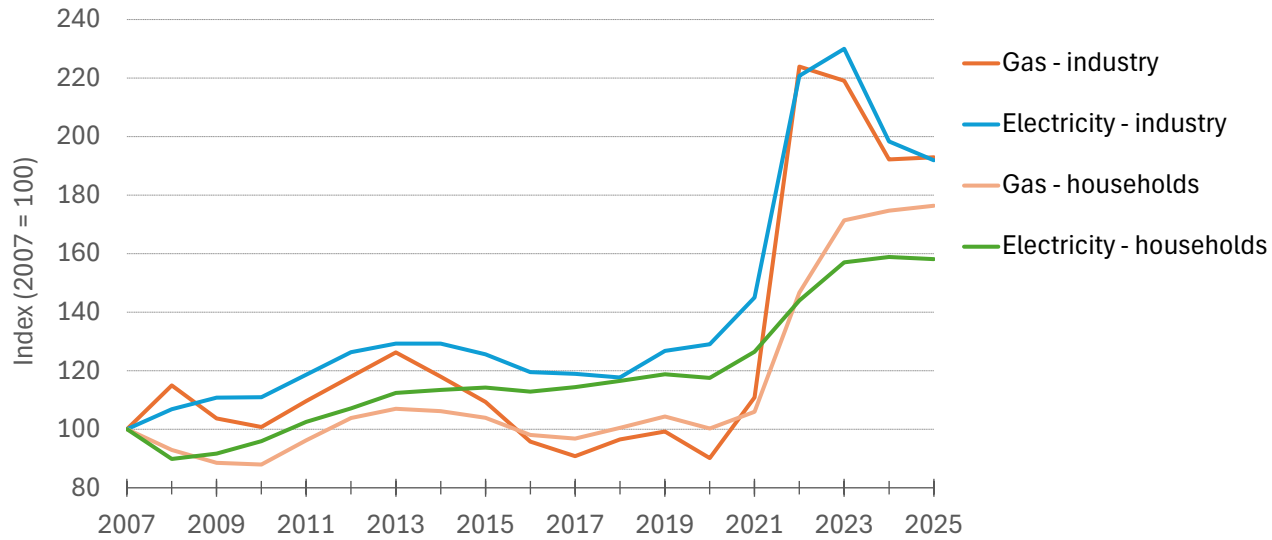
Figure 11: Final energy consumption in the EU



Source: Eurostat

Energy prices also influence greenhouse gas emissions. Higher energy prices can reduce energy demand, but they can also create social and economic pressures for households and businesses. Electricity and gas prices increased sharply in the EU between 2021 and 2022 and remained high afterwards (see Figure 12). This contributed to lower demand for energy, but also affected industrial production and household energy costs.

Figure 12: Average end-user energy prices in the EU



Note: Prices are nominal, i.e. not adjusted for inflation.

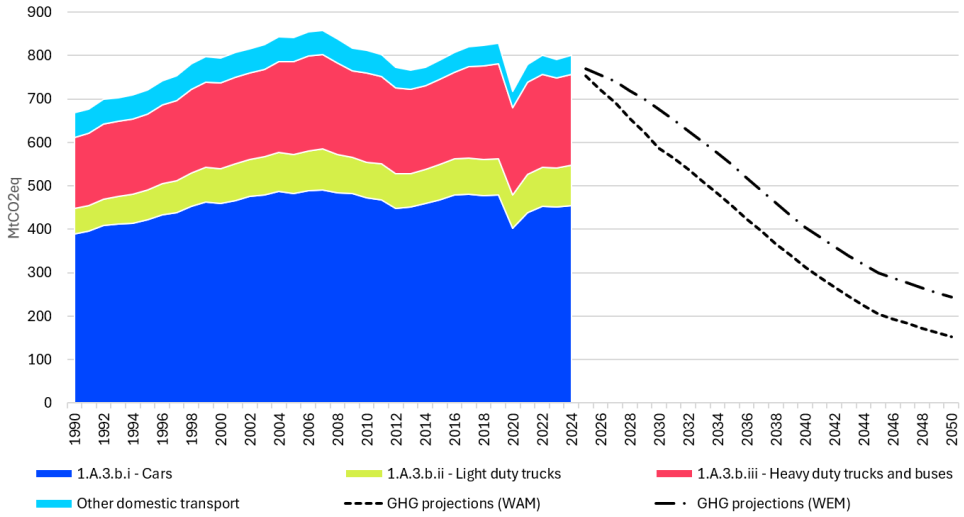
Source: Eurostat

Transforming the EU energy system is essential for meeting the EU's climate target. Energy use is gradually falling, fossil fuels are becoming less important, and renewable electricity is growing quickly. However, transport, buildings and industry still depend heavily on fossil fuels. More information on EU energy policies and measures is provided in Section 3.5.4.

Transport

Transport is a key source of emissions, comprising 27% of total GHG emissions in 2024, excluding LULUCF. It is the only major economic sector where GHG emissions have increased since 1990: by 19%, or 28% when international transport is included. Transport is also the largest contributor to emissions of NOx, which harms human health and the environment. The transport sector is one of the main sources of environmental noise pollution in Europe[10].

Figure 13: GHG emissions in domestic transport (historic and projected)

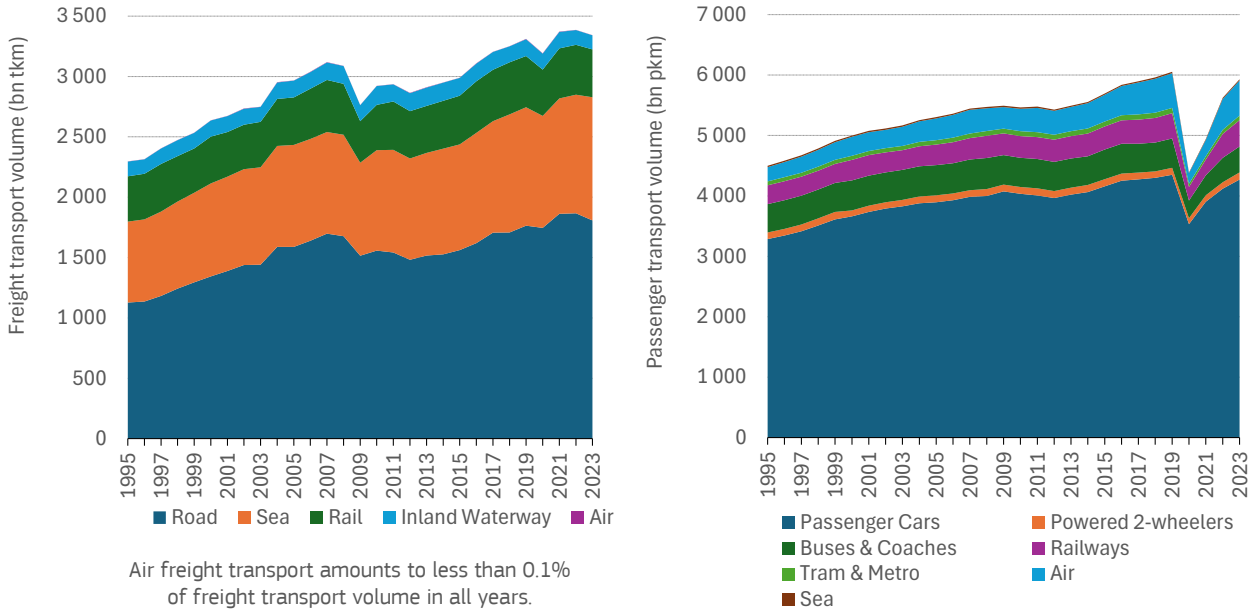


Source: 2026 GHG inventory submission of the EU (1990-2024) and 2026 GHG projections (2025-2050)

In 2024, domestic transport emissions represented more than a quarter of the EU's overall GHG emissions. They peaked in 2007, slowed down following the global financial and economic crisis, then rebounded before dropping significantly with the outburst of the COVID-19 pandemic. As a result, in 2024 emissions had decreased only slightly since 2005, by 5%. In 2024, the road transport sector was responsible for most transport emissions, approximately 95%, or 72% when international shipping and aviation are included. More than 70% of road transport emissions originate from passenger cars and vans. Between 2005 and 2024, emissions from road transport decreased by only 4%. This shows that improved vehicle efficiency and the uptake of low-emission powertrains have barely outweighed the effect of the continued increase in road transport activity (see Figure 14).

[10] European Environment Agency. (2025). *Environmental noise in Europe 2025*. Publications Office of the European Union.

Figure 14: Freight and passenger transport volume in the EU



Note: Air transport in this graph covers only domestic and intra-EU transport. Maritime transport is not included.

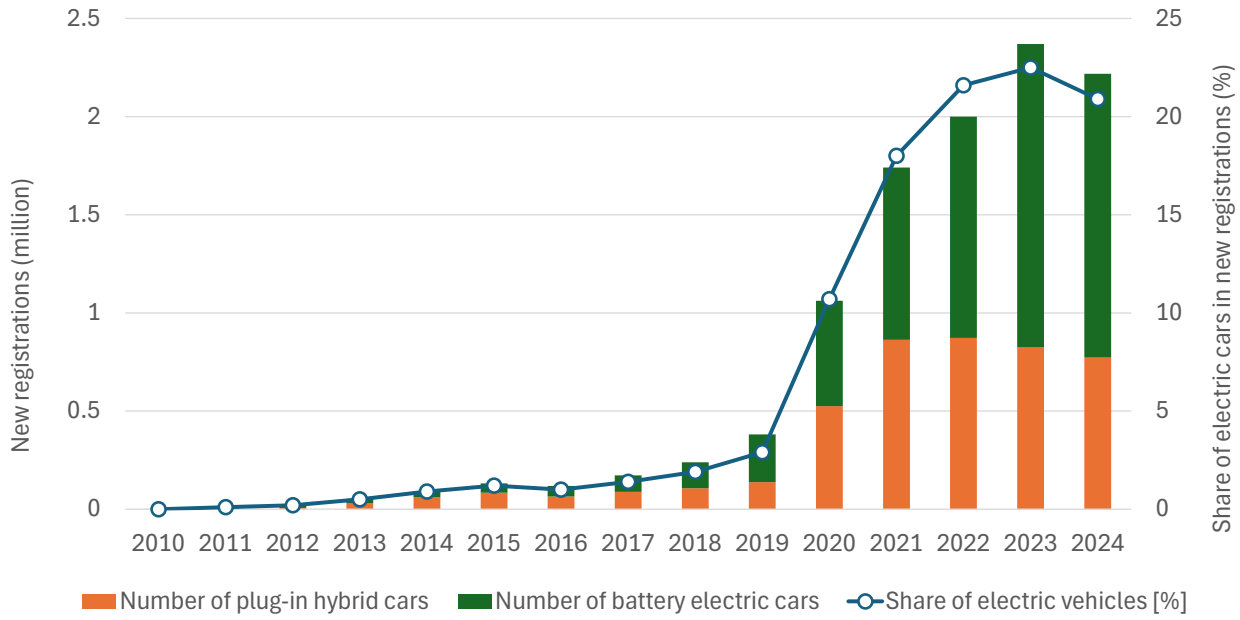
Source: Eurostat and EU Transport in figures

Recognising these issues, the EU has put in place robust climate policies for cutting emissions in the transport sector. The EU's regulatory framework, which includes CO_2 emission standards for vehicles and the gradual expansion of the EU Emissions Trading System, sets clear limits and incentives for cleaner mobility solutions. Initiatives under the European Green Deal and the Fit for 55 package further support the shift to low- and zero-emission vehicles through investments in infrastructure, such as charging stations, and promoting alternative fuels like hydrogen and bioenergy. EU Member States are complementing these efforts with policies like congestion charges, vehicle taxation reforms and incentives for electric mobility.

Technological advancements offer promising avenues for decarbonisation in the transport sector. The adoption of electric vehicles (EVs) is accelerating, triggered by EU legislation and supported by national incentives and infrastructure investments. Electric cars (both battery electric and plug-in hybrid electric) accounted for approximately 21% of all new cars registered in the EU in 2024 (Figure 15). Additionally, the integration of digital technologies, such as smart logistics, multimodal transport systems and digital demand management, can optimise mobility patterns, reduce congestion and improve energy efficiency[11]. EU and national policies that promote rail over road transport, invest in cleaner fuels, and encourage behavioural shifts towards sustainable modes of transport further bolster these technological opportunities.

[11] European Environment Agency, Transport and Environment Report 2022, https://www.eea.europa.eu/en/analysis/publications/transport-and-environment-report-2022.

Figure 15: New registrations of EVs in the EU



Source: European Environment Agency

Industry

The industry sector is central to the EU's transition towards climate neutrality. First, it represents almost a quarter of the EU's current emissions and therefore has an important role to play in the decarbonisation of the EU's energy system. Furthermore, it is manufacturing the climate solutions of the future, including innovative construction materials, sustainable transport solutions and new technologies that enable emission reductions across the society.

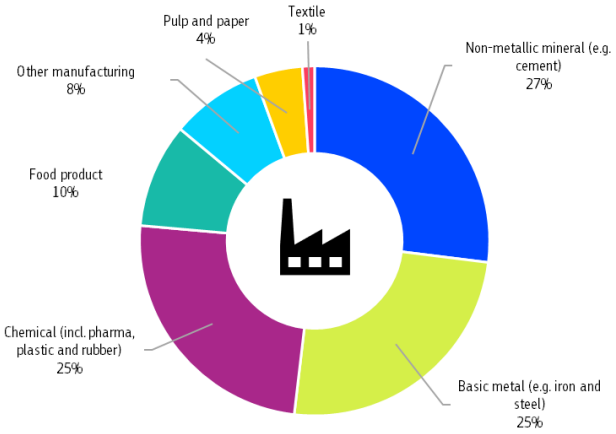
Emissions from the industry sector are reported under the following two main categories in the greenhouse gas inventories:

- fuel combustion in industry (CRT category 1.A.2 - Manufacturing industries and construction);
- industrial processes and product use (CRT sector 2 - Industrial processes and product use (IPPU)).

The first category covers emissions from fuel combustion in various industrial activities, such as the iron and steel industry, glass, ceramics, cement production and chemical manufacturing. The second category includes emissions emitted directly during industrial production.

In 2024, the industry sector accounted for around 20% of total EU greenhouse gas emissions excluding LULUCF. Of those industry sector emissions, 57% were from fuel combustion and 43% from industrial processes. As shown in Figure 16, the non-metallic mineral industry, including cement, glass and ceramics, was responsible for 27% of total industrial emissions, followed by the iron and steel industry and the chemical industry, which each contributed 25%.

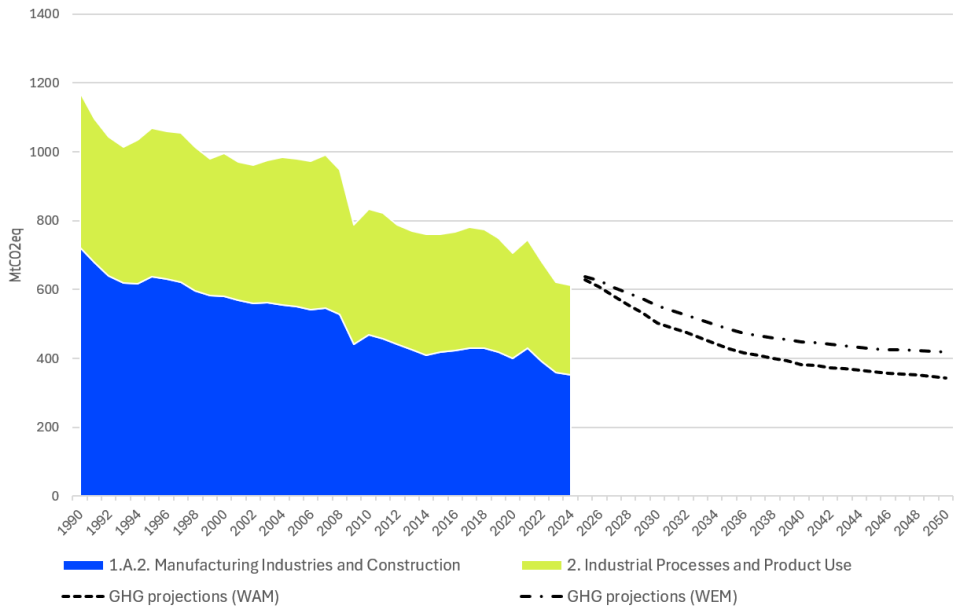
Figure 16: Industrial GHG emissions by industry subsector (2024, %)



Source: Eurostat

Between 2005 and 2024, total GHG emissions from industry declined by 38%. Emissions from fuel combustion decreased by 36%, and process-related emissions by 39%, indicating a comparable rate of reduction in both sources (see Figure 17).

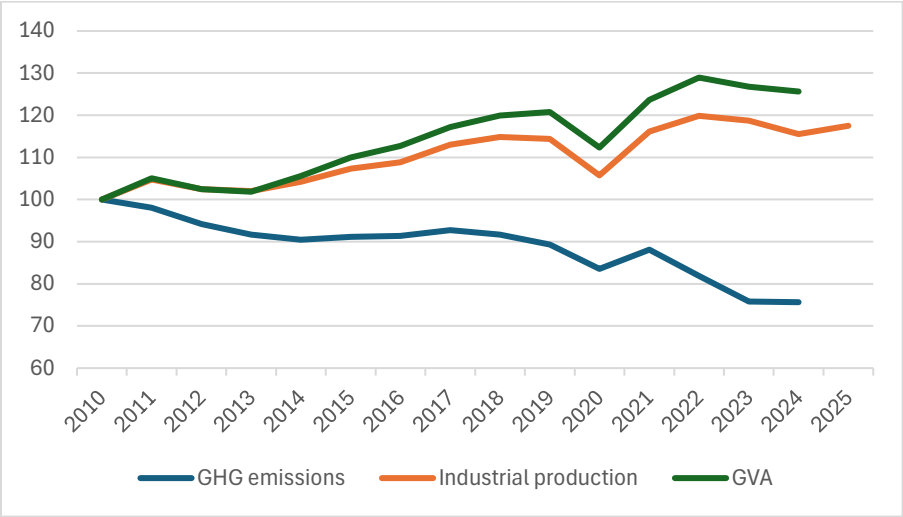
Figure 17: GHG emissions in industry (historical and projected)



Source: 2026 GHG inventory (1990-2024) and 2026 GHG projections (2025-2050)

Between 2010 and 2024, manufacturing gross value added (GVA) increased by 26%, while production grew by 16%. The concurrent reduction in greenhouse gas emissions suggests a decoupling of economic growth and emissions in the manufacturing sector, demonstrating that increases in both value added and output can be consistent with emission reductions (see Figure 18).

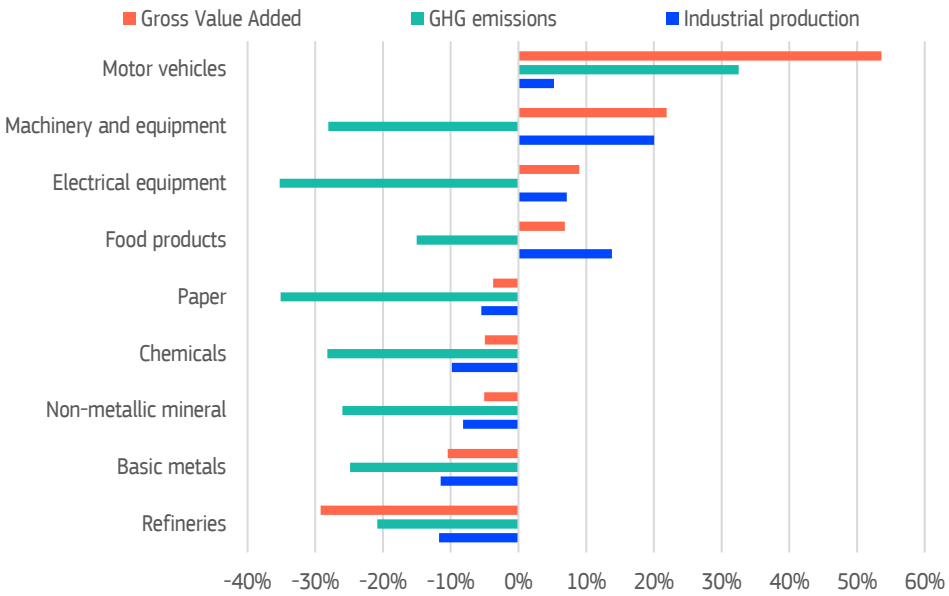
Figure 18: Gross value added, industrial production and GHG emissions of the manufacturing sector (2010=100)



Source: 2026 GHG inventory submission of the EU (category 1.A.2.and sector 2), Eurostat

The industrial sector is highly diverse, with subsectors varying considerably in their emission intensities and technological capabilities. Figure 19 illustrates these trends across key manufacturing industries. While automotive, machinery and food production saw strong growth in economic value, energy-intensive sectors, especially cement, and iron and steel, experienced declines in both production value and volume.

Figure 19: Change in industrial production, GVA and GHG emissions in the main manufacturing sectors



Note: The changes are calculated over the following periods: 2010–2025 for industrial production, 2010–2023 for gross value added, and 2010–2024 for GHG emissions.

Note: For the chemical and refineries sectors, the EU GVA at the EU level is calculated by aggregating the available data (data are missing for some EU Member States due to Eurostat confidentiality clauses).

Source: Eurostat

This decoupling between greenhouse gas emissions and gross value added reflects gains in energy efficiency (i.e. producing more value with less energy), a transition to cleaner energy sources and structural shifts in production. These structural shifts could have included a move away from energy-intensive industries towards higher-value, lower-emission goods and services. At the same time, emissions from industrial processes and product use have declined, demonstrating the EU's ability to strengthen industrial competitiveness while cutting emissions.

Adopting innovative strategies to decarbonise the industrial sector presents numerous opportunities for sustainable development and long-term competitiveness. In early 2025, the European Commission introduced the Clean Industrial Deal and the action plan for affordable energy to lower energy bills, accelerate the green transition and strengthen the Energy Union. Crucially, those initiatives demonstrate that industrial strength and energy affordability can mutually reinforce economic resilience. A key pathway to achieving these goals is the circular economy model, supported by frameworks like the Ecodesign for Sustainable Products Regulation. By prioritising resource efficiency, waste reduction and material reuse, industries can significantly lower their carbon footprints while reducing critical raw material dependencies.

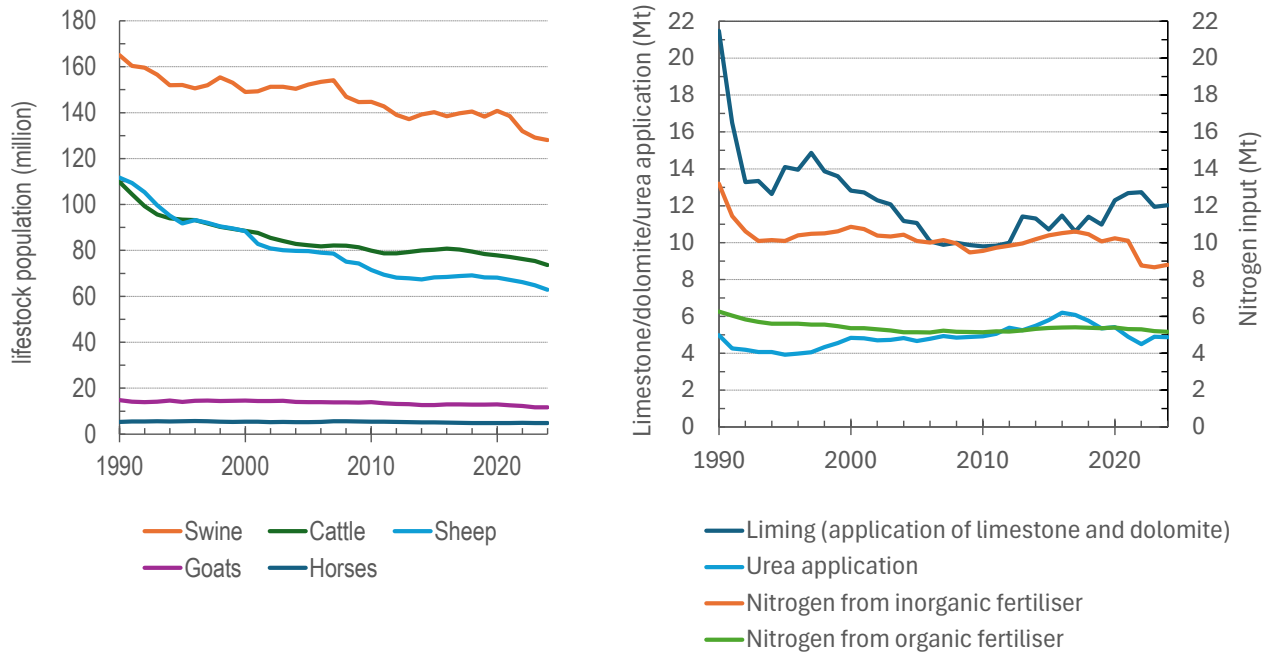
Agriculture

Agriculture is one of the main land uses in the EU and plays an important role in food production, the economy of rural areas, land management and the bioeconomy. Around 39% of the EU's surface area is used for agriculture. Agricultural land also contributes to emissions and removals accounted for under the LULUCF sector.

The main emissions in agriculture come from livestock production (49% of the total agriculture emissions), manure management (17%) and the application of fertilisers (24%). Methane is emitted primarily by livestock, particularly cattle, during enteric fermentation, and from manure management. Nitrous oxide is emitted mainly from agricultural soils as a result of nitrogen inputs, including synthetic fertilisers and manure, as well as from manure management. Carbon dioxide emissions from the agriculture sector are relatively small but arise from the application of limestone, dolomite and urea-based fertilisers.

Changes in livestock numbers and fertiliser use are important drivers of agricultural emissions. In the EU, livestock populations have changed over recent decades. Between 1990 and 2024, cattle, sheep and pig populations decreased by 33%, 44% and 22%, respectively (see Figure 20).

Figure 20: Livestock population and fertiliser application in the EU



Source: 2026 GHG inventory submission of the EU (1990-2024)

Over the same period, the use of some fertilisers and soil amendments also decreased. Liming fell by 44% and the application of inorganic fertiliser by 33%, while urea application decreased by 2% and nitrogen from organic fertiliser by 17%.

Future emission trends will depend mainly on livestock numbers, manure management, fertiliser use and farming practices. Agriculture is also increasingly affected by climate change. Droughts, heatwaves, floods, changing rainfall patterns and new pests can affect crop yields, livestock health and farm productivity. This makes adaptation an important part of agricultural policy and farm management.

Forests

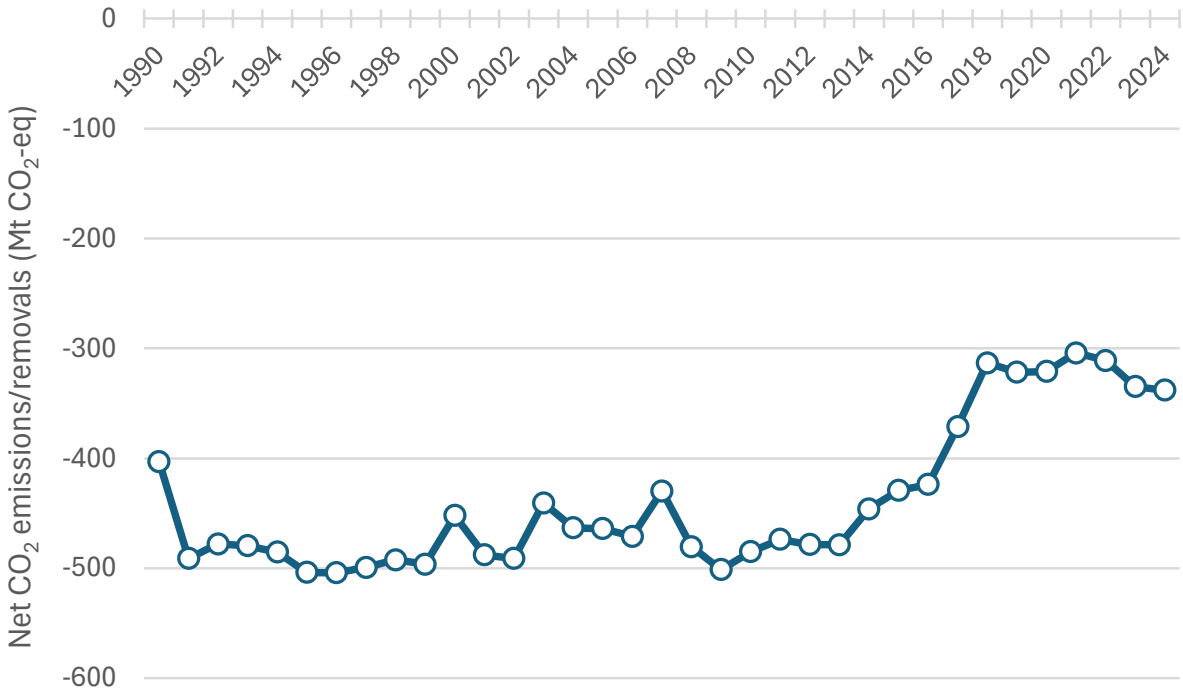
Forests are one of the most important land types in the EU. Woodland accounts for around 41% of all land in the EU. Most woodland in the EU is used for forestry and related economic activities, although the role and intensity of forest use vary significantly across the EU.

EU forests provide a wide range of benefits. They store large amounts of carbon, remove carbon dioxide from the atmosphere, support biodiversity, protect soils and water resources, and provide wood and other forest-based products and services. They are also important for rural areas and for the EU bioeconomy. Because of this, forest management is closely linked to climate change mitigation, biodiversity protection, adaptation to climate change and economic activity in rural regions.

Forests with living biomass, dead wood, litter, soil and harvested wood products are a significant carbon sink in the EU. In 2024, the LULUCF sector as a whole removed 231 $MtCO_2$-eq from the atmosphere. Some measures, such as maintaining permanent grassland, restoring peatlands and wetlands, and introducing agroforestry, can also increase carbon storage in soils and biomass Forest land is the main sink. However, the EU forest sink has declined over the past 15 years (see Figure 21). This decline is linked

to several factors, including increased harvesting, ageing of forests, lower annual forest growth, droughts, wildfires, storms, insect outbreaks and other climate-related impacts.

Figure 21: Net CO_2 emissions/removals from forest land



Note: Net CO_2 emissions from forest land including CO_2 emissions from biomass burning

Source: 2026 GHG inventory submission of the EU (1990-2024)

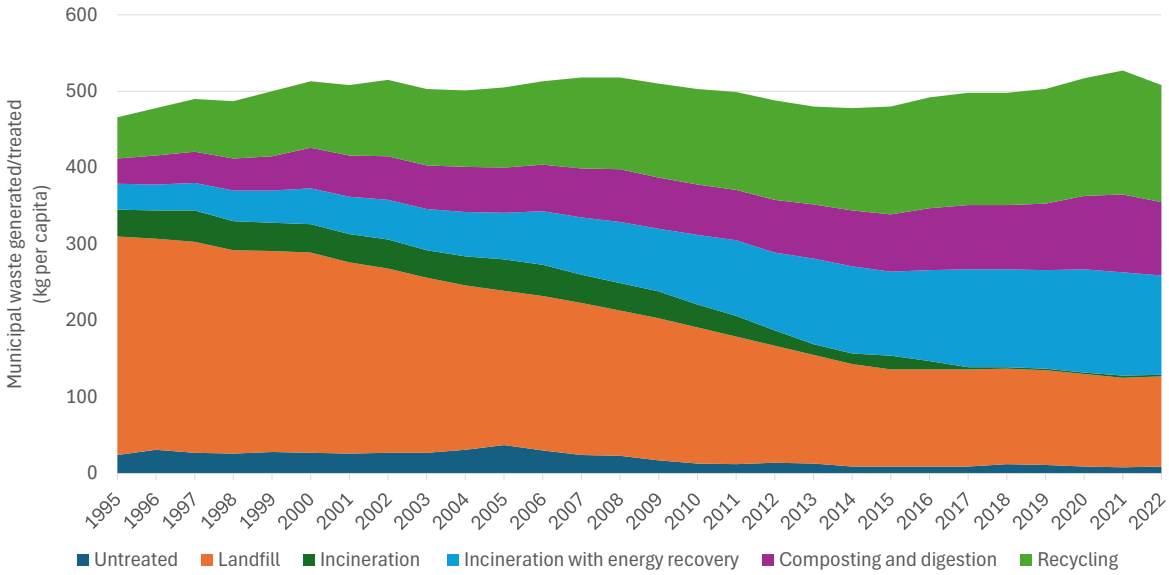
Waste

The waste sector represents a relatively small share of total EU greenhouse gas emissions, but changes in waste treatment have contributed to emission reductions over recent decades. The waste sector comprises emissions from solid waste disposal (landfills), wastewater treatment and discharge, biological treatment of solid waste (e.g. composting and anaerobic digestion), waste incineration without energy recovery, and open burning of waste.

Municipal waste generation in the EU has remained relatively stable over recent decades.

However, the way municipal waste is treated has changed significantly. The share of waste sent to landfill has decreased, while recycling, composting and digestion, and incineration with energy recovery have increased (see Figure 22). This shift reflects EU and national waste policies, including measures to promote the waste hierarchy, separate collection, recycling and recovery, and to reduce the amount of biodegradable waste sent to landfill.

Figure 22: Treatment of municipal waste in the EU



Source: Eurostat

The move away from landfilling is important for climate change mitigation. Landfills are a major source of methane emissions in the waste sector, especially when biodegradable waste decomposes without oxygen. Reducing the amount of biodegradable waste sent to landfill, improving landfill management and increasing landfill gas recovery have helped to reduce these emissions. At the same time, more waste is now treated through recycling, composting, anaerobic digestion and incineration with energy recovery.

Waste incineration causes carbon dioxide emissions, especially when waste contains fossil fuel-based materials such as plastics. However, when incineration includes energy recovery, the recovered energy can also be used instead of fossil fuels for heat or electricity generation. For this reason, the climate impact of waste treatment depends not only on the amount of waste generated, but also on the composition of the waste and the treatment method used.

Buildings

Buildings are the single largest energy consumer in the EU[12]. This significant energy demand still relies largely on fossil fuels. Making buildings more energy efficient and shifting to renewable energy sources are therefore key strategies to reduce emissions from this sector.

The Energy Performance of Building Directive sets out the main pathways to a decarbonised EU building stock. Those pathways focus on setting cost-optimal minimum energy performance requirements, promoting highly energy-efficient buildings, strengthening the Energy Performance Certificate scheme and developing long-term renovation strategies with a view to mobilising energy-efficiency investments in residential and commercial buildings. The Recovery and Resilience Facility and

[12] Improving energy efficiency of buildings to reduce bills and save energy - European Commission.

cohesion policy allocate a significant portion of funds to improve energy efficiency in buildings.

Emissions from buildings are reported under two main categories in the greenhouse gas inventories:

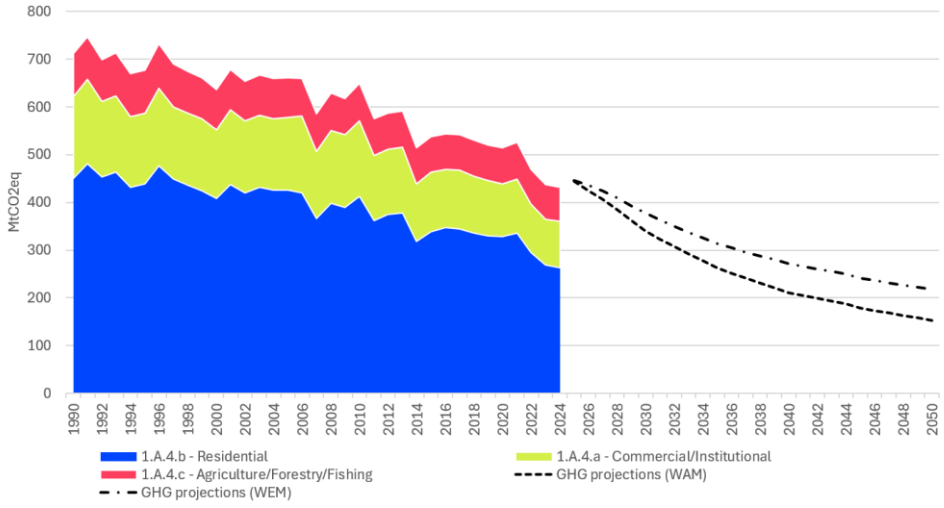
- residential buildings (1.A.4.b);
- non-residential buildings (commercial/institutional, 1.A.4.a).

To facilitate comparison across countries and projected emissions, in this analysis, the buildings sector also includes emissions from fuel combustion in agriculture, forestry and fishing (1.A.4.c)[13].

In 2024, buildings emissions represented nearly 14% of the EU's total GHG emissions. Of those emissions, 61% were from residential buildings, and 22% from non-residential buildings (commercial and institutional). The pace of emissions reduction increased visibly after 2005.

Between 2005 and 2024, emissions from residential buildings and non-residential buildings dropped by 38% and 36%, respectively, while fuel combustion in farms and fishery installations fell by 15% (Figure 23). Emission reductions were due to a combination of factors, including stricter energy efficiency standards for new buildings, improved energy efficiency in existing buildings, and a shift towards electricity and cleaner energy sources for heating. A general trend towards warmer winter temperatures, and therefore reduced winter heating needs, has also helped reduce emissions from buildings.

Figure 23: GHG emissions in residential and non-residential buildings (historic and projected)



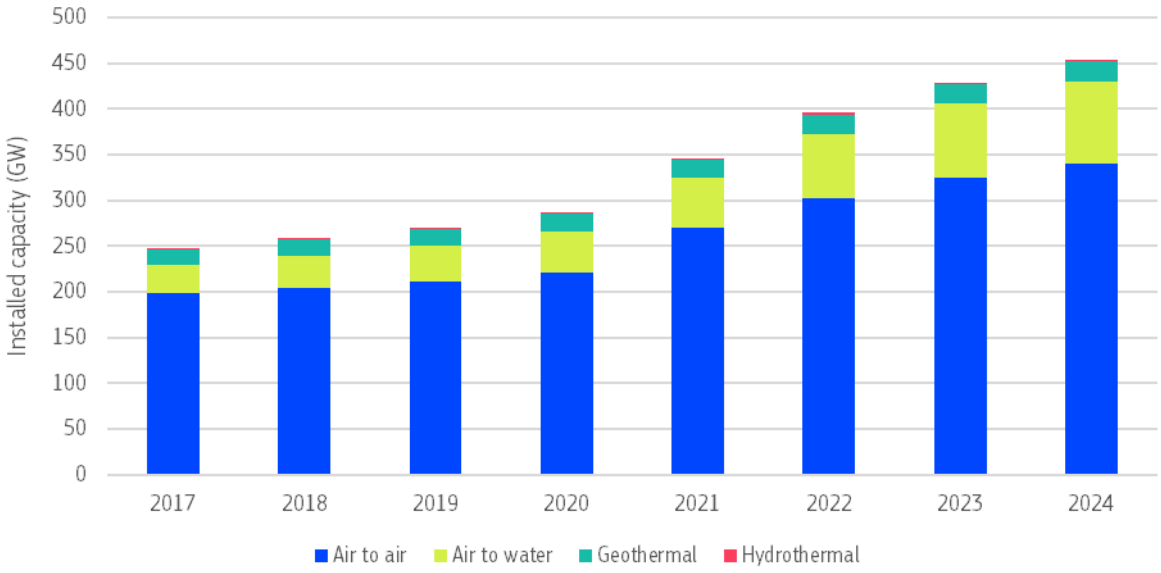
Source: 2026 GHG inventory submission of the EU (1990-2024), and 2026 GHG projections (2025-2050)

Note: Based on 2025 GHG inventories and 2025 GHG projections submitted by EU Member States. The estimated contribution to the EU 2030 EU target is based on the modelling outcomes of the core policy scenario supporting the Fit for 55 initiatives.

[13] This includes emissions from stationary sources like heating and machinery used on farms, forestry operations, and fish farms, as well as mobile sources like tractors, fishing boats, and other machinery used in these activities.

The reduction of emissions from the heating and cooling of buildings presents significant opportunities within the EU's framework for energy efficiency. Advances in low-carbon technologies, particularly the widespread adoption of heat pumps, are expected to play a pivotal role in this transition (Figure 24).

Figure 24: Installed capacities of heat pumps in the EU



Source: Eurostat

3.1.2 Institutional arrangements

Institutional arrangements for tracking progress

The EU's Governance Regulation establishes a mechanism to track the progress of the EU and its Member States towards the EU's climate and energy targets and commitments under the UNFCCC and the Paris Agreement. The mechanism includes the monitoring and projections of GHG emissions and removals, the reporting of policies and measures, and progress on adaptation to climate change. The main domestic tool for tracking progress is the Climate Action Progress Report. It is published every year by the European Commission and reviews how the EU and its Member States are progressing on climate policies and meeting their climate targets.

The progress is tracked across three main policy areas:

- the EU Emissions Trading System (EU ETS), which covers emissions from power generation, energy-intensive industries, and aviation and maritime transport;
- the Effort Sharing Regulation (ESR), which includes the areas of transport, buildings, agriculture, waste, and small industry that are not covered by the EU ETS;
- the LULUCF sector which covers both emissions and removals from land use.

The report uses information and data from three main sources:

- greenhouse gas inventory;
- national energy and climate progress reports;
- policies, measures and projections.

The Climate Action Progress Report is part of a larger package of reports released together with the State of the Energy Union report.

Greenhouse gas inventory

The EU has set up its inventory system to ensure that data reported by the EU and its Member States are timely, transparent, accurate, consistent, comparable and complete. This inventory system includes a quality assurance and quality control programme, common procedures for estimating emissions, and comprehensive reviews of national inventory data to assess the progress towards climate goals.

The GHG inventory covers all emissions and removals from the following sectors:

- energy;
- industrial processes and product use;
- agriculture;
- LULUCF;
- waste;
- other sources, and indirect CO_2 emissions.

Each EU Member State prepares its GHG inventory in line with the reporting guidelines under the Paris Agreement[14] and the 2006 Intergovernmental Panel on Climate Change (IPCC) guidelines. GHG inventory data on anthropogenic GHG emissions and removals, including information on methods, are then sent electronically to the European Environment Agency (EEA), where they are checked for quality and combined into one EU GHG inventory. The full details are provided in Section 1.2 of the EU's National Inventory Document.

National energy and climate progress reports

Every two years, each EU Member State reports to the European Commission on its progress in implementing its national energy and climate plan (NECP). These plans set national targets, policies and measures for climate mitigation, renewable energy, energy efficiency, adaptation and related areas up to 2030. This reporting is done through the national energy and climate progress reports, which allows the European Commission to monitor progress towards the 2030 intermediate target, climate neutrality and climate change adaptation objectives.

Policies, measures and projections

EU Member States also operate national systems for policies, measures and projections. They submit standardised data to the EEA by 15 March each year. The EEA checks the quality and completeness of the data and compiles projections of the total GHG emissions and removals for the EU.

Both the EU and the national systems are subject to continuous improvements.

[14] 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.

NECPs were introduced by the Governance Regulation. They are a key planning tool for EU Member States to outline how each of them intends to reach and track progress towards the climate and energy targets from 2021 to 2030.
In these 10-year strategic documents, EU Member States set out their national targets, contributions and policies, as well as the measures needed to achieve EU climate and energy goals. These plans were first submitted in 2019 and were updated in 2024-2025 to reflect the more ambitious goals of the Fit for 55 package and the REPowerEU plan.
This update allowed EU Members States to review their progress, identify gaps and revise existing policies, or plan new ones where needed.
In May 2025, after the updated plans were submitted, the European Commission concluded in its EU-wide assessment that, if fully implemented, the plans would reduce net greenhouse gas emissions by up to 54%, close to its 2030 legally binding reduction target of 55%. Overall, EU Member States are encouraged to implement additional measures in the transport and building sectors to meet their targets under the Effort Sharing Regulation, and to continue stepping up action to reduce emissions from aviation and maritime transport, and to increase removals or reduce emissions in the LULUCF sector.

Institutional arrangements implementing the NDCs

The EU and its Member States have set up a comprehensive system to implement the EU's climate change mitigation targets. The European Climate Law sets the goal of climate neutrality by 2050, and the intermediate targets of reducing net greenhouse gas emissions by at least 55% by 2030 and by 90% by 2040, compared with 1990. These targets cover emissions and removals regulated under EU law.

As described in the EU's updated NDC submitted in October 2023, the EU has outlined three main policies to ensure that it meets its target of reducing emissions by 55% by 2030.

- The EU Emissions Trading System (ETS) aims to cut emissions by 62% compared with 2005 levels.
- The Effort Sharing Regulation sets a target of a 40% reduction compared with 2005 levels.
- The Land Use, Land-Use Change and Forestry (LULUCF) Regulation provides for an additional 42 $MtCO_2$-eq land-based net removal compared with the 2016-2018 average.

The ESR is supported by additional sectoral policies and measures. More details are provided in the chapter on mitigation policies and measures.

The Fit for 55 legislative package adopted in 2023 significantly deepens and broadens the decarbonisation of the economies of the EU and its Member States to achieve the 2030 targets and climate neutrality by 2050. That package strengthens the EU ETS[15], the LULUCF Regulation and the ESR.

[15] This refers to the ETS1, i.e. the Emissions 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

- The EU ETS caps GHG emissions in energy, industry, aviation and maritime transport;
- the LULUCF Regulation includes national net removal targets for the LULUCF sector; and;
- the ESR sets 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.

These main instruments are supported by additional legislation like the ETS2 for buildings, transport and small industry not covered by the existing EU ETS. Comprehensive measures have also been introduced to accelerate the uptake of renewable energy, improve energy efficiency and promote sustainable mobility. Those measures target companies, households and public administrations, while supporting investments in clean and decarbonisation technologies.

This architecture ensures effective emission reductions through the combined, reinforcing effect of overlapping policies, requiring all sectors of the economy to contribute. The European Commission's impact assessments demonstrate that the 2030 climate targets are best achieved through this integrated policy scenario, rather than through individual measures. This interconnected approach ensures a fair, cost-effective, and competitive transition across all EU Member States.

The progress made in implementing these policies and measures is monitored under the Governance Regulation. Relevant information, which is reported regularly to the EEA, includes the UNFCCC GHG inventories, approximated GHG inventories for the previous year, information on policies and measures, projections and progress towards the implementation of integrated NECPs. This information helps the EU and its Member States to correct their course if progress towards the 2030 targets is behind schedule. As an example, the European Commission assesses the drafts of new or updated NECPs and provides recommendations to improve 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.

All EU legislation, including the legislation under the 2030 climate and energy framework, is subject to stakeholder engagement. The EU's better regulation tools help ensure that policy is based on evidence and good practice. When preparing a legislative proposal, the European Commission invites individuals, businesses and stakeholder organisations to share their views. These comments are published on a dedicated portal, and the European Commission explains how it has taken them into account when developing its proposal. The Governance Regulation also requires EU Member States to ensure that the public is given early and effective opportunities to participate in the preparation of the NECPs.

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).

The revised EU ETS Directive increases the existing system's emissions reduction target from 43% to 62% by 2030, compared with 2005 levels, and extends the system to apply also to international maritime transport. A separate carbon pricing system (ETS2) will apply to fuel combustion in road transport, buildings and other sectors (mainly small industry) with a 42% emission reduction target compared with 2005 levels across the sectors covered. The amended Effort Sharing Regulation (ESR) increased, for the sectors that it covers, the EU-level greenhouse gas emissions reduction target from 29% to 40% by 2030, compared with 2005 levels, which resulted in updated 2030 targets for each EU Member State.
The LULUCF Regulation sets an overall EU-level objective for an additional 42 $MtCO_2$-eq land-based net removal in 2030 compared with the 2016-2018 average. This is broken down into net carbon removal targets for the EU and for each Member State.
The ESR sets national targets for reducing GHG emissions in the EU Member States by 2030. Member States are also subject to annual emission limits that gradually decrease every year from 2021 to 2030. The annual progress towards the national targets under the effort sharing legislation is assessed by comparing greenhouse gas emission levels from the sectors covered by the ESR with the relevant annual emission allocations under the legislation. To achieve compliance under the ESR, EU Member States are permitted to use flexibilities to a certain extent.

3.2 Description of the nationally determined contribution

In its updated 2030 nationally determined contribution (2030 NDC), the EU commits to reducing net greenhouse gas emissions by at least 55% by 2030 compared with 1990 levels.

In November 2025, the EU submitted to the UNFCCC an updated NDC covering the period up to 2035.[43] The submission reiterates the EU's 2030 target and includes an indicative contribution of a 66.25%-72.5% net reduction in greenhouse gas emissions by 2035 compared with 1990 levels. It also reflects the EU's broader climate trajectory towards a 90% net reduction in greenhouse gas emissions by 2040 and climate neutrality by 2050.

This new submission is an important step in the EU's long-term climate action. It sets a more ambitious target for the EU on the paths towards climate neutrality by 2050 and builds on continued emission reductions and the revised European Climate Law.

As the 2035 NDC's implementation period has not yet begun, this Biennial Transparency Report (BTR) tracks progress towards the 2030 NDC only.

3.2.1 Scope of the 2030 nationally determined contribution

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

The scope of the 2030 NDC is supplemented by additional information to clarify the international aviation and maritime emissions that are covered under the 2030 NDC. Details can be found in the NDC description below. Information on the cooperation with Iceland, Liechtenstein and Norway under the EEA agreement and with Northern Ireland under the Protocol on Ireland/Northern Ireland within the EU ETS Directive, ESR and LULUCF Regulations and their implications for the EU 2030 NDC are further explained in annex II to this BTR.

International aviation

For the purposes of the EU's 2030 NDC, international aviation covers only CO_2 emissions from: (i) civil aviation activities set out for 2030 in Annex I to the EU ETS Directive and (ii) flights that are subject to effective carbon pricing under the EU ETS as shown in Table 1.

Table 1: Aviation emissions covered by the 2030 NDC

Flights		Example	2030 NDC scope
Domestic aviation	Domestic flights in EU countries	Palermo–Rome	● Yes
	Domestic flights to/from outermost regions	Canary Islands–Madrid	● Yes
International aviation	Flights between two EU countries	Brussels–Prague	● Yes
	Flights from Iceland and Norway to the EU	Oslo–Brussels	○ No
	Flights from the EU to Iceland and Norway	Brussels–Oslo	● Yes
	Flights between the EU and outermost regions	Paris–Canary Islands	● Yes *(since 01/2024)*
	Flights from the EU to the UK and Switzerland	Prague–London	● Yes
	Flights from the UK and Switzerland to the EU	London–Prague	○ No
	Flights between the EU and other countries not mentioned above	Rome–New York	○ No

In July 2026, the European Commission has proposed a revised EU ETS including scope for aviation, following an assessment of the Carbon Offsetting and Reduction Scheme for International Aviation's (CORSIA) ambition and participation under the revised EU ETS Directive. For more information on the recent proposals to amend the EU ETS, see Section 3.5.3.

Maritime transport

Maritime transport is included in the scope of the EU's 2030 NDC in respect of emissions from domestic maritime activities and emissions that are subject to effective carbon pricing through the EU ETS. The extension of the EU ETS to maritime emissions covers carbon dioxide emissions from ships above 5 000 gross tonnage, as well as methane and nitrous oxide emissions as from 1 January 2026. The EU ETS applies to 50% of the emissions from voyages starting or ending outside the EU, and to all emissions from voyages within the EU and emissions from ships within EU ports.

Unlike aviation, maritime transport has a different and narrower scope in the EU's 2030 NDC compared with the scope of the EU ETS. The latter also covers half of the emissions from voyages between the EU and countries outside the EU.

Table 2: Emissions from international navigation covered by the 2030 NDC

Voyages		Example	2030 NDC scope
Domestic navigation	Voyages in EU countries	Valencia-Barcelona	● Yes
International navigation	Voyages between two EU countries (covered under the ETS)	Valencia-Rotterdam	● Yes
	Voyages between an EU country and Norway/Iceland (covered under the ETS)	Rotterdam-Oslo	○ No
	Voyages between an EU country and other country outside the EU (covered under the ETS)	Rotterdam-Houston	○ No
	Voyages between Norway/Iceland and other country outside the EU	Oslo-Houston	○ No
	'Within port' emissions in an EU port	Marseille	● Yes
	'Within port' emissions in a port in Norway / Iceland / other country outside the EU	Oslo	○ No

3.2.2 Description of the 2030 nationally determined contribution

The EU set out its 2030 NDC in its submission to the UNFCCC on 17 October 2023.

Table 3: Description of the EU's 2030 NDC

Information	Description
Target and description	Economy-wide net domestic reduction of at least 55% of GHG emission by 2030 compared with 1990. The term 'domestic' means without the use of international credits.
Target type	Economy-wide net emissions reduction.
Target year	2030 (single-year target)
Base year	1990
Base year value	Net greenhouse gas emissions level in 1990: 4 662 620 ktCO_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 set out in Annex I to decision 5/CMA[16].3: energy, industrial processes and product use, agriculture, land use, land-use change and forestry (LULUCF), waste. ***International aviation:*** emissions from civil aviation activities as set out for 2030 in Annex I to the EU ETS Directive are included in the NDC 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. ***International navigation:*** waterborne 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	Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (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 goal of a net reduction in GHG by least 55% by 2030 is to be achieved through domestic measures only, without contribution from international credits. The EU will account for and report on 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	The information on the NDC's scope contains clarifications/further details compared with the information provided in the updated NDC of the EU.

[16] CMA refers to the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement.

applicable	

Note: This table is identical to the 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.

3.2.3 Description of the 2035 nationally determined contribution

The EU set out its 2035 NDC in its submission to the UNFCCC on 5 November 2025.

In April 2026, the amendment to the EU Climate Law entered into force. It sets a legally binding 2040 target of reducing net GHG emissions by 90% compared with 1990 levels. Of that target, at least 85% must be achieved through domestic action, while up to 5% may be achieved using high-quality international carbon credits, available only from 2036 (with an earlier 2031-2035 pilot phase to help build market capacity). The revision is designed to bridge the EU's 2030 target (55% reduction) and its 2050 climate-neutrality objective.

Table 4: Description of the EU's 2035 NDC

Information	Description
Target and description	In response to decision 6/CMA.3 on common time frames for NDCs and decision 1/CMA.5 on the global stocktake, the EU and its Member States, acting jointly, aim to achieve, by 2035, an indicative contribution of a reduction of net GHG emissions of between 66.25% and 72.5% compared with 1990 levels. This is based on indicative linear trajectories from, on the one hand, the EU's climate targets for 2030 and 2050, and, on the other hand, the EU's climate targets for 2030 and 2040
Target type	Economy-wide net emissions reduction
Target year	2035 (single-year target)
Base year	1990
Implementation period	2031-2035
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 set out in Annex I to decision 5/CMA.3: energy, industrial processes and product use, agriculture, LULUCF, waste and international aviation. ***International aviation:*** emissions from civil aviation are included in respect of CO_2 emissions from flights subject to effective carbon pricing through the EU ETS (which, up to 31 December 2026, comprises flights within the European Economic Area, departing flights to Switzerland and departing flights to the United Kingdom).

Information	Description
	International navigation: *international navigation is included in respect of emissions from domestic navigation activities and emissions subject to effective carbon pricing through the EU ETS. The extension of the EU ETS to maritime emissions covers CO_2 emissions from ships above 5 000 gross tonnage, as well as methane and nitrous oxide emissions as from 1 January 2026. It applies to 50% of emissions from voyages starting or ending outside the EU, and to all emissions from voyages within the EU and emissions from ships within EU ports.*
Gases	Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (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	Of the 2040 90% reduction target, up to 5% may be achieved using high-quality international carbon credits, available only from 2036. Therefore, the adequate contribution from international credits will be reflected as of 2036. The EU will account for and report on cooperative approaches 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	N/A

3.2.4 Arrangements for assessing progress towards the joint NDC of the EU and its Member States

In September 2025, the conclusions of the UNFCCC second meeting of lead reviewers[17] of biennial transparency reports suggested that the assessment of progress towards the single joint NDC target of the EU and its Member States should be reviewed **only during the review of the EU's BTR,** while the review of the 27 EU Member States' individual BTRs should take the form of a non-technical check if Member States include a reference to the EU's BTR and common tabular format (CTF) tables.

If the reported information differs, the technical expert review team should make a recommendation stating that the EU Member State has reported information that is inconsistent with the EU's reporting on the joint target.

If an EU Member State has additional NDC targets for territories not included in the joint target, progress towards those targets should be reviewed during the review of the Member States' individual BTRs.

17 Conclusions of the second meeting of lead reviewers of biennial transparency reports, https://unfccc.int/documents/650053.

3.3 Summary of progress, indicator and methodologies

3.3.1 Indicator

Progress towards implementing and achieving the EU's 2030 NDC is monitored using an indicator expressed in the same unit and metric as the NDC base year and target values. The indicator selected for this purpose is 'annual total net GHG emissions consistent with the scope of the NDC in CO_2-eq'. Table 5 provides more information on this indicator.

Table 5: Indicator for tracking progress

Information	Description
Selected indicator	Annual total net GHG emissions consistent with the scope of the NDC in CO_2-eq
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 4 662 620 kt CO_2-eq.
Updates	The value of the reference level has been updated owing to methodological improvements to the EU GHG inventory.
Relation to the NDC	The indicator is defined with 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': Total net GHG emissions correspond to the annual total of emissions and removals reported in CO_2 equivalents in the EU's latest GHG inventory. 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 and indirect CO_2 emissions of those EU Member States that report these emissions.

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 EU GHG inventory 1990-2024.

3.3.2 Methodologies and accounting approach

The EU uses the following accounting approach for tracking progress towards the joint EU NDC: annual GHG data from the national GHG inventory of the EU is complemented with estimates from the Joint Research Centre's Integrated Database of the European Energy System that take emissions from international aviation and navigation into account. The total net greenhouse gas emissions are provided in the scope of the EU NDC and are compared with the economy-wide absolute emissions reduction target as defined in the NDC. The EU will account for its cooperation with other Parties in a manner consistent with relevant guidance.

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

Details on methodologies and accounting approaches that are consistent with the accounting guidance under the Paris Agreement can be found in CTF Table 3

('Methodologies and accounting approaches'), which was submitted electronically together with this BTR.

3.3.3 Structured summary – status of progress

The most recent data on GHG emissions and removals in the scope of the NDC constitute the key information for tracking this progress. Table 6 summarises the current status of progress.

Table 6: Summary of progress towards implementing and achieving the NDC

	Unit	Base year value	Values in the implementation period				Target level	Target year	Progress made towards the NDC
			2021	2022	2023	2024			
Indicator: total net GHG emissions consistent with the scope of the EU NDC	$ktCO_2$-eq	4 662 620	3 283 198	3 221 663	2 956 310	2 872 818	At least 55% below base year level	2030	The most recent level of the indicator is 38.4% below the base year level.

Note that an annual emissions balance consistent with Chapter III.B (Application of the corresponding adjustment) will be provided in a subsequent BTR.

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 EU GHG inventory 1990-2024.

According to the GHG inventory data and data on international aviation and navigation in the scope of the NDC for 2024, the EU and its Member States have reduced net GHG emissions by 38.4% compared with 1990.

This shows that the EU is making progress towards its NDC. The legal and institutional framework is in place to support further emission reductions and to reach the 2030 target.

3.4 Investments in climate action

Stepping up climate action is a critical investment that will protect public budgets, people and assets, and secure the EU's economic resilience and energy independence. Between 1980 and 2024, climate-related extreme events caused an estimated EUR 822 billion in economic losses across the EU. A quarter of those losses have occurred since 2022, highlighting the growing pressure that these disasters place on public finances and debt sustainability.

However, prioritising the green transition offers significant relief. For instance, the EU could reduce fossil fuel imports by EUR 2.8 trillion between 2031 and 2050, compared with the 2011-2020 average. This is equivalent to around 0.7% of current EU GDP per

year. Beyond these massive financial savings, proactive climate action increases strategic autonomy, reduces vulnerability to economic shocks and delivers vital societal benefits like cleaner air, better public health and lower healthcare costs.

Realising these benefits requires investment that supports the transition. Achieving the Paris Agreement's goals therefore means not only increasing climate finance but also taking climate impacts into account in financial and economic decisions and directing investment towards a low-emission and climate-resilient economy. This section describes how the EU is contributing to this objective under Article 2(1)(c) of the Paris Agreement.

Article 2(1)(c) of the Paris Agreement

'This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.'

This requires a combination of climate and financial policies. Carbon pricing and support for clean technologies can create incentives for investment. Rules requiring companies to publish sustainability information, together with the EU taxonomy, can improve transparency and help investors identify sustainable activities. Financial instruments such as green bonds, guarantees and blended finance can help mobilise additional capital. These measures are most effective when they work together as part of a coherent policy framework.

For the EU, aligning financial flows with climate goals is also closely linked to competitiveness. Investment in clean technologies, infrastructure and more efficient use of resources can support economic growth while helping the EU move towards climate neutrality and greater resilience.

3.4.1 Future needs

Adaptation

A recent study estimates that around EUR 69 billion needs to be invested in climate adaptation across the EU every year up to 2050. Over the period 2026-2050, this would amount to more than EUR 1 trillion in net present value.

The largest investment needs are in infrastructure, at around EUR 29 billion a year. This includes measures to protect buildings, transport networks, energy systems and water infrastructure from climate impacts. Around EUR 21 billion a year is needed to strengthen ecosystems, while EUR 11.5 billion is needed for food systems and EUR 7 billion for health.

Around EUR 25 billion a year, or more than one third of the total, is linked to the most urgent climate risks identified at EU level. These include flooding and risks to crop production.

The study concludes that current investment in adaptation is not sufficient. Climate risks need to be better reflected in public budgets, investment planning and private-sector decisions. Better data are also needed to assess the costs and benefits of adaptation measures and to identify the climate risks that can't be eliminated through action.

Mitigation

As highlighted in the 2025 Climate Action Progress Report, investment needs to increase substantially to meet the EU's climate and energy targets and strengthen resilience to climate impacts. Annual investment in the energy system needs to reach around EUR 565 billion in 2021-2030, more than double the level of the previous decade, excluding transport. The largest increases are needed in electricity grids, building renovation and industrial decarbonisation. The investment needs for achieving the 2040 target and climate neutrality in 2050 were estimated in the impact assessment for the 2040 climate target at close to EUR 660 billion annually in 2031-2050. An updated assessment of the investment needs in line with the Commission proposals for the post-2030 climate and energy package is expected to be published in the first quarter of 2026.

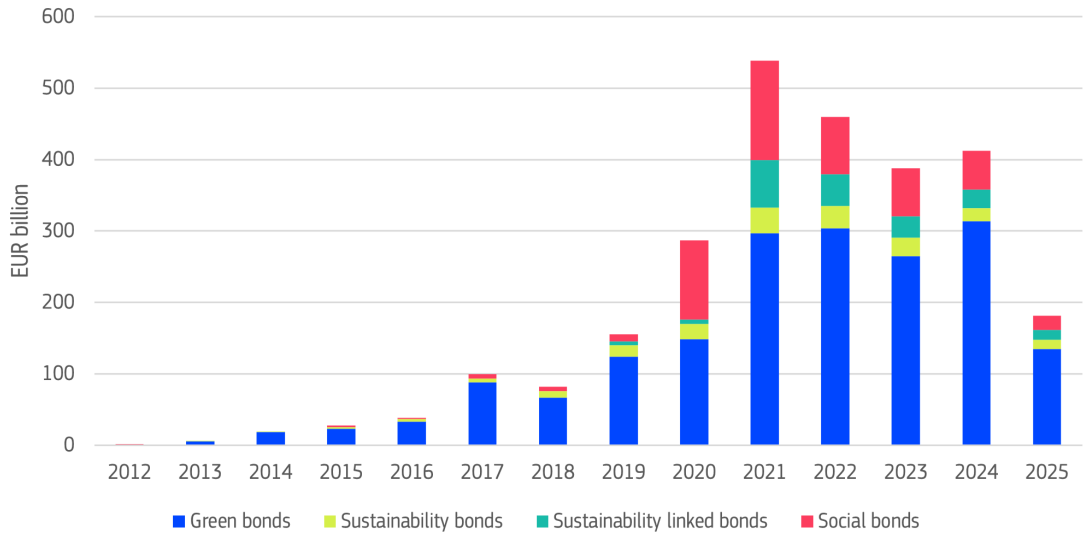
3.4.2 Mobilising private-sector investment

Given the scale of investment needs, private-sector contributions to financing both climate resilience and climate mitigation need to be substantial. This is why the EU put together a policy framework that specifically aims to facilitate private-sector investments in sustainable activities, in addition to the incentives for private investment provided by the mitigation policies and measures described in section 3.5 and the public funding set out in section 3.4.3. The Sustainable Finance Framework provides investors with robust definitions of sustainable activities (the EU Taxonomy), requires companies and financial institutions to disclose their impact on the environment and climate (Corporate Sustainability Reporting Directive), and provide information on how sustainability factors are taken into account in financial product they make available (Sustainable Finance Disclosure Regulation). The rules governing sustainable finance are currently being simplified to reduce their administrative burden on companies, while making the framework more workable and impactful. In February 2025, the Commission put forward legislative proposals to reduce the volume of sustainability reports and the number of companies that need to report this information. In November 2025, it proposed to streamline disclosures for sustainability-related financial products, grouped into three categories. The Commission is also considering other simplification measures.

Over the past years, the corporate and financial sectors have channelled significant resources towards green objectives in the EU. For instance, in 2025, capital investments by large companies into **the EU Taxonomy-aligned activities** amounted to EUR 323.8 billion, bringing the **cumulative reported value to EUR 1.224 trillion of sustainable investments since 2022**. Overall, Taxonomy-aligned investments continue to remain stable.

In the financial sector, certain instruments have emerged as a fundamental tool to mobilise private capital. Figure 25 presents the annual amounts of ESG (environmental, social or corporate governance) bonds issued in the EU by the first half of June 2025. Green bonds (i.e. bonds financing green projects) continue to dominate the ESG market. The volume of new green bonds issued amounted to EUR 314 billion in 2024, its highest level since the first issuance of green bonds in 2007. In contrast, sustainability-linked bonds (i.e. bonds for which issuers pay a higher interest if they do not meet their pre-defined 'sustainability' objectives) continue to decrease, amounting to only EUR 26 billion in 2024, compared with EUR 66 billion in 2021 and EUR 45 billion in 2022. This decrease reflects the more rigorous approach to sustainability taken by investors. Similarly, social bonds (i.e. bonds financing social projects) and sustainability bonds (i.e. bonds financing a combination of green and social projects) both saw a decrease, reinforcing the prevalence of green bonds.

Figure 25: Annual volumes issued in the EU – ESG bonds



Source: London Stock Exchange Group, JRC calculations. Data as at15 June 2025.

The EU is a global leader in the green bonds market. In every year between 2021 and 2024, EU green bonds accounted for over 3% of all bond issuances globally (reaching 2.7% in mid-2025), which is much higher than the non-EU share of green bonds at less than 0.5%.

To bring greater transparency and credibility to these financial instruments, the EU adopted, as of December 2024, the European Green Bond Regulation, which is a voluntary framework for issuers who wish to label their bonds as European Green Bonds. This standard is based on the detailed criteria of the EU taxonomy to define green economic activities, ensuring transparency levels that align with market best practices. It also introduces supervision for companies conducting pre- and post-issuance reviews at EU level. Since the European Green Bond standard became available to issuers in December 2024, market adoption has gained momentum. The bond issuers raised **EUR 60 billion** of fresh capital by September 2026[18]. European Green Bonds accounted for 11% of all EEA green bonds issuances in the second quarter

[18] Platform on Sustainable Finance (Report on Monitoring of Capital Flows, 2026).

of 2026 (up from 6% compared to the same period in 2025)[19]. To further broaden the attractiveness and use of the European Green Bond standard, the Commission will maintain reviewing the EU Taxonomy technical screening criteria.

Banks and other financial institutions are increasingly required to take climate-related financial risks into account. Revised EU banking rules (CRR3/CRD6) require banks to identify, disclose and manage both physical risks, such as damage from floods or heatwaves, and transition risks linked to the shift to a low-emission economy. This work is supported by the European Central Bank and the European Banking Authority, including through climate stress testing. Since June 2026, the European Central Bank has also taken climate-related risks into account when assessing corporate bonds that banks use as security for central bank borrowing. Bonds that are more exposed to climate transition risks are assigned a slightly lower value, reducing the amount that banks can borrow against them.

The EU framework for institutions for occupational retirement provisions (IORPs) regulates supplementary occupational pension funds managing retirement savings. On 20 November 2025 the European Commission proposed changes to the IORP II Directive. The proposal strengthens requirements for pension funds to take sustainability factors into account when making investment decisions. As pension funds manage large amounts of long-term savings, this can help channel more private investment towards projects that reduce greenhouse gas emissions or strengthen resilience to climate change.

Climate risks are also becoming more significant for insurance. Historically, only around a quarter of economic losses from extreme weather and climate-related events in Europe have been insured. The Solvency II Directive integrates sustainability risks into insurance prudential rules. The European Commission's Climate Resilience Dialogue has also brought together insurers, reinsurers, public authorities and consumers to explore how this protection gap can be further reduced.

3.4.3 Public funding

EU funding supports climate action across all sectors, helping to put regulatory and economic policies into practice and to incentivise private investment. Together with private investment, it provides funding for the technologies, infrastructure and other investments needed to achieve the EU's climate targets and to strengthen resilience and preparedness.

The EU supports climate action through three main funding pillars:

- the regular EU budget;
- the temporary Recovery and Resilience Facility (RRF); and
- revenues linked to the EU Emissions Trading System.

These funding sources help public authorities, businesses, households and researchers invest in the transition to a climate-neutral and climate-resilient economy. They support renewable energy, electricity grids, energy efficiency, clean transport, industrial

[19] ESMA (Green Finance Dashboard – 2Q26).

decarbonisation, research and innovation, climate adaptation and the development of workers' skills. They also help regions, households and businesses that face greater costs during the transition. The EU provides this support through grants, loans, guarantees and other financial instruments.

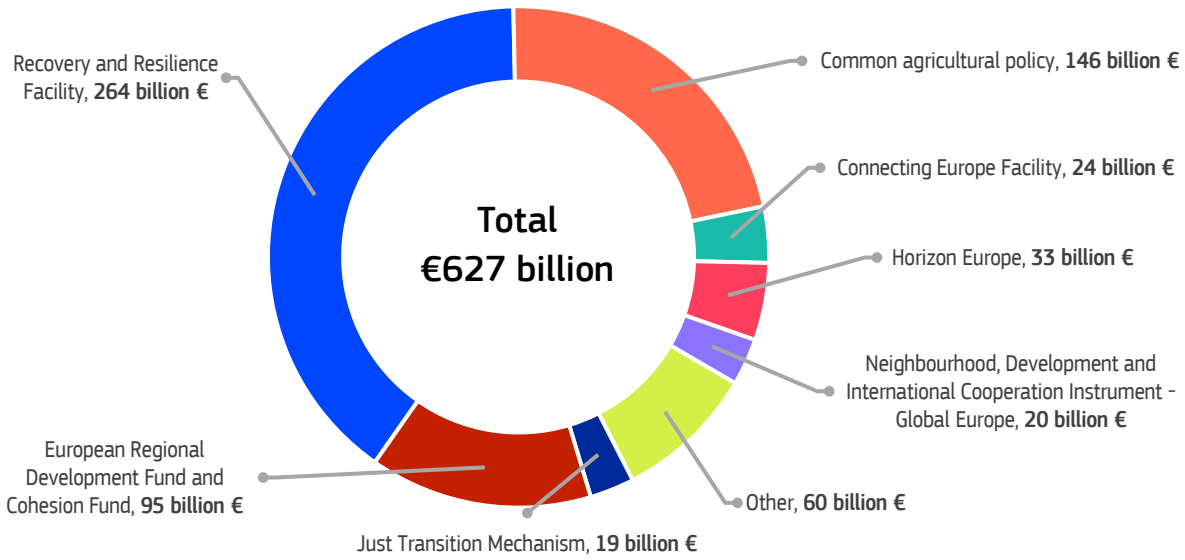
The EU's **regular budget for 2021-2027** represents the largest and most diverse source of EU funding. The EU supports climate objectives through many different spending programmes rather than financing them through a single climate fund. Cohesion policy funds support investments in clean energy, sustainable transport, energy efficiency, adaptation and regional development. The Just Transition Fund provides targeted support to regions that face serious social and economic effects from the transition away from fossil fuels and carbon-intensive activities, including by promoting women's participation in upskilling, entrepreneurship and technical occupations linked to the energy and industrial transition.

The common agricultural policy supports climate action in agriculture and rural areas. Other programmes play more specialised roles. Horizon Europe finances research and innovation, while the LIFE programme focuses on environmental and climate projects. The Connecting Europe Facility supports cross-border energy and transport infrastructure. InvestEU uses an EU budget guarantee to attract additional public and private investment.

Alongside the regular EU budget, the EU created the temporary **RRF** in response to the COVID-19 crisis, with a duration until the end of August 2026. It forms the main part of **NextGenerationEU** and provides grants and loans for reforms and investments in EU Member States. Each national recovery and resilience plan must allocate at least 37% of its expenditure to climate objectives. In practice, EU Member States have allocated around 40% of the facility's expenditure to climate measures, with some of them spending well over half of their allocation on climate action. Around EUR 8 billion contributes to adaptation and the management of climate related risks, while the remainder supports mitigation efforts. National recovery and resilience plans support clean energy, building renovation, sustainable transport, industrial transformation and other measures that contribute to the green transition. They were updated with REPowerEU chapters in response to the energy crisis triggered by Russia's invasion of Ukraine to support measures that reduce dependence on fossil fuels, diversify energy supplies and accelerate the deployment of clean energy. Commission's estimates indicate that RRF-supported investments can generate approximately 54 $MtCO_2$-eq of annual emission savings (around 1.2% of 1990 net emissions), while RRF-supported reforms contribute 52 $MtCO_2$-eq in annual emission savings (around 1.1%), based on a subset of measures that can be quantified.

Taken together, the regular EU budget and NextGenerationEU are projected to contribute around EUR 661 billion to climate objectives during 2021-2027. This represents around 34% of the total budget, well above the overall climate spending target of 30%.

Figure 26: Climate contribution of the EU budget (2021-2027, billion EUR)



Source: EU budget contribution to climate action.

The **EU ETS** provides another major source of funding. The system requires polluters to pay for their greenhouse gas emissions. The auctioning of emission allowances generates revenues for EU Member States and several EU-level funds. The system has raised well over EUR 270 billion in auction revenues since 2013. EU Member States must use these revenues to support climate action and the energy transition. They can use them for renewable energy, energy efficiency, clean transport, industrial decarbonisation, climate adaptation and support for a just transition. At EU level, the **Innovation Fund** supports innovative low-carbon and clean technologies across the EU. The **Modernisation Fund** is helping 13 lower-income EU Member States to modernise their energy systems and improve energy efficiency. The **Social Climate Fund** will support vulnerable households, transport users and microenterprises affected by the new emissions trading system for buildings, road transport and small industry. In addition to the EU-wide carbon pricing system, some EU Member States apply their own national carbon pricing measures to sectors not covered by the EU ETS to secure additional funding.

Together, these funding sources cover different needs and stages of the transition. Some programmes finance research and first-of-a-kind technologies. Others support the large-scale deployment of proven solutions, public infrastructure or measures for households and regions. EU funding cannot cover all investment needs, but it can help launch projects, reduce risks and attract additional national and private investment.

The European Investment Bank, the EU's public investment bank, also plays an important role in financing the transition. Under its Climate Bank Roadmap, all new financing must be aligned with the Paris Agreement, and more than half should support climate action and environmental sustainability. In 2025, the European Investment Bank invested EUR 50.3 billion for this purpose, committing more than 60% of total financing

to supporting the green transition[20]The updated Roadmap for 2026-2030 keeps these commitments and places greater emphasis on mobilising private investment and financing climate adaptation. The European Bank for Reconstruction and Development has similar commitments. Since 2023, all its activities have been aligned with the Paris Agreement, and at least half of its annual investment is intended to support green projects, with EUR 9.4 billion of green financing committed in 2025, approximately 56% of total financing amounts[21].

Green budgeting is also becoming more common at national level. It helps governments assess how public spending and taxation contribute to climate and environmental objectives. According to the 2025 survey, 21 of the 26 reporting EU Member States have introduced or plan to introduce green budgeting practices. Many are also increasingly aligning their approaches with the EU taxonomy and integrate "Do No Significant Harm" screening methodologies.

From 2026, EU Member States are also required, where possible, to report in their budget documents how climate-related risks could affect public finances over the medium and long term.

Reducing public support for fossil fuels is another important part of aligning financial flows with climate goals. The European Commission tracks fossil fuel subsidies annually through its State of the Energy Union Report, with a specific report on energy subsidies in the EU. EU Member States are also required to report on their plans and measures to phase out fossil fuels.

Fossil fuel subsidies in the EU amounted to around EUR 97 billion in 2024. They rose sharply during the 2022 energy crisis and have remained well above pre-crisis levels. The European Commission continues to call on EU Member States to set clear phase-out plans, including through their National Energy and Climate Plans. The phase out of certain fossil fuel subsidies is also addressed through country-specific recommendations under the European Semester of economic and social policy coordination.

3.4.4 International finance

The EU also promotes sustainable finance internationally. The International Platform on Sustainable Finance, co-founded by the EU in 2019, brings together public authorities from major economies to exchange on sustainable-finance policies and strengthen comparability and interoperability across approaches. The platform's work has included taxonomy comparability, including through the Common Ground Taxonomy, which helps identify commonalities among different classification systems. More recent cooperation has increasingly focused on practical implementation and peer learning.

The EU supports partner countries in developing sustainable finance frameworks. The Global Green Bond Initiative and the Sustainable Finance Advisory Hub provide technical assistance in areas such as taxonomies, standards and green bond markets.

[20] Climate and environment – What we offer

[21] EBRD invests record €16.8 billion in 2025

The Global Green Bond Initiative is a flagship of the Global Gateway strategy. Signed in April 2026, it combines a EUR 3 billion blended-finance fund with technical assistance and support for bond issuers. It aims to mobilise up to EUR 20 billion in private investment, with at least one fifth of investments being directed towards least developed countries. Further details on the EU's international climate finance instruments are provided in Chapter 5.

The wider Global Gateway strategy supports sustainable investment in partner countries. By October 2025, it had mobilised more than EUR 300 billion in investments. The new objective is to mobilise EUR 400 billion by 2027. The European Fund for Sustainable Development Plus will play an important role by using guarantees and blended finance to reduce risks and attract private investment.

The EU is working through the OECD to align officially supported export credits with climate goals. In 2021, participating countries agreed to end export credit support for unabated coal-fired power. The rules were further updated in 2023, and the EU continues to support extending restrictions to other fossil fuel energy projects.

Estimated mitigation impact

There is no single estimate of the emission reductions achieved through EU funding. EU funds help implement climate policies and support investments together with national and private funding. Their impact is therefore usually captured through the cross-cutting and sectoral policies they support, rather than calculated separately for each funding programme.
As implementation progresses, the impact of individual funds and programmes becomes easier to assess. For example, the European Commission estimates that RRF-supported investments and reforms could reduce emissions by 54 and 52 $MtCO_2$-eq per year respectively, equivalent to around 1.2 and 1.1 of EU net emissions in 1990. A recent evaluation of the Modernisation Fund estimates average annual reductions of 83.7 $MtCO_2$-eq, equivalent to around 32% of 2020 emissions from the electricity, gas, steam and air-conditioning sectors in the beneficiary EU Member States. The common agricultural policy has the potential to contribute around 35 $MtCO_2$-eq per year through greenhouse gas emission reductions and increased carbon removals across the EU. However, the actual impact will depend on farmers' uptake of the measures and how effectively they are implemented.

3.5 Mitigation policies and measures

Since the submission of BTR1, the EU has focused on supporting action in Member States to meet the 2030 target, setting an EU climate target for 2040 as the next step towards climate neutrality, and ensuring that decarbonisation strengthens the EU's competitiveness and resilience.

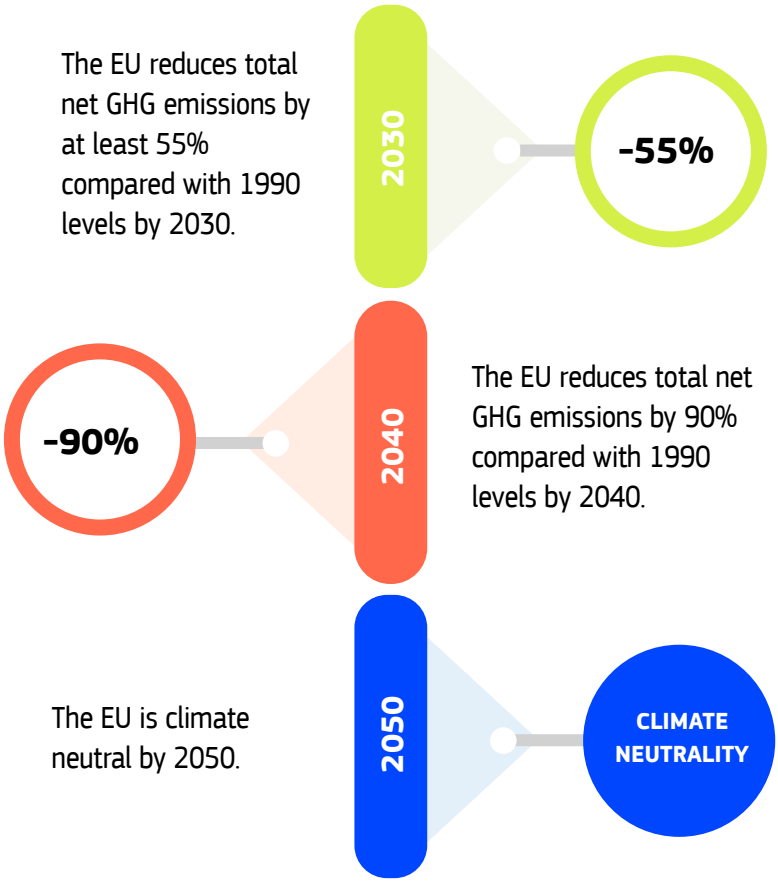
The European Commission continued to prepare the legislation needed to implement the revised EU climate laws and the Fit for 55 package. This includes measures implementing:

- the Effort Sharing Regulation (ESR);
- the Regulation on land use, land-use change, and forestry (LULUCF);
- the Regulation on CO_2 emission standards for cars and vans;
- the EU Emissions Trading System (ETS), including revised rules for aviation and the extension of the ETS to the maritime sector;
- the ETS2 for buildings and road transport;
- the Carbon Border Adjustment Mechanism, including a broader exemption for smaller importers; and
- the Social Climate Fund.

In 2024, the European Commission presented, on the basis of an impact assessment, its Communication on the 2040 climate target and recommended reducing the EU's net greenhouse gas emissions by 90% by 2040 compared with 1990. The proposal was later adopted and entered into force in 2026. It sets a legally binding target to reduce net greenhouse gas emissions by 90% by 2040, with a contribution of up to 5% from high-quality international credits. The 2040 target provides a clear pathway towards climate neutrality by 2050. Achieving that target will require wider use of carbon capture, substantial reductions in GHG emissions from the land sector, and a fully developed carbon management industry by 2040. In parallel, the EU and its Member States agreed on their 2040 nationally determined contribution under the Paris Agreement, which was submitted to the UNFCCC on 5 November 2025 (see Section 3.2.1).

The Fit for 55 package and the 2040 climate target set the overall framework for EU climate policy over the coming decades. The policies and measures described in the following sections will help to achieve the EU's nationally determined contribution (NDC) under the Paris Agreement, the legally binding targets under the European Climate Law, and climate neutrality by 2050.

Figure 27: EU legally binding climate targets



3.5.1 EU policy framework

The EU's 2030 climate and energy framework is the main set of laws for meeting the EU's commitments under the Paris Agreement and its NDC. The framework's main components are the EU ETS, the ESR and the LULUCF Regulation.

The framework was originally based on the EU's 2015 NDC, which set the target of reducing greenhouse gas emissions by 40% by 2030 compared with 1990. In 2020, the EU increased this target to a net reduction of at least 55%. To achieve that, legislation under the Fit for 55 package was adopted in 2023 and 2024. Only the revision of EU energy taxation rules has not yet been adopted.

The Governance Regulation provides the framework for planning, reporting and monitoring progress towards the EU's 2030 climate and energy targets, and its commitments under the Paris Agreement.

Alongside its legally binding climate targets and legislation, the EU has several key strategies that set out the path towards climate neutrality. These strategies are described in the following sections.

Long-term strategy

In 2020, the EU became the first major economy to commit to economy-wide climate neutrality by submitting its long-term strategy to the UNFCCC.

The strategy sets out a vision for achieving climate neutrality by 2050 through a fair transition across all sectors of the economy. It identifies seven strategic priorities, including making full use of the bioeconomy and strengthening carbon sinks.

Clean Industrial Deal

In February 2025, the European Commission adopted the Clean Industrial Deal (CID), together with the action plan for affordable energy. The CID is an EU policy framework to help European industry reduce its greenhouse gas emissions while remaining competitive. It is not a law itself. Instead, it sets the direction for a range of legislative, financial and other measures that are being developed and implemented.

The framework focuses on six main areas: (i) making energy more affordable; (ii) creating demand for cleaner products; (iii) increasing public and private investment; (iv) improving access to raw materials and promoting recycling and circularity; (v) strengthening access to global markets; and (vi) supporting skills and quality jobs.

The CID is being implemented through more specific measures and sectoral action plans, including for the automotive, steel and metals, chemicals and clean-technology industries. For reporting purposes, it is classified as an enabling instrument.

Bioeconomy strategy

The Strategy for a Competitive and Sustainable EU Bioeconomy adopted in November 2025, aims to build on advances in biotechnology and follows the EU bioeconomy strategies of 2012 and 2018, which helped strengthen research and innovation in this field.

The bioeconomy covers economic activities that use biological resources to produce goods and services. It includes sectors such as agriculture, forestry, fisheries and aquaculture, as well as biomass processing, biomanufacturing and biotechnology in areas including food, health, energy and industry. Biological resources include primary and secondary biomass, such as by-products and residues, as well as genetic resources and biogenic carbon captured through innovative technologies.

The new Bioeconomy Strategy has three main goals:

- **Strengthening the competitiveness of the EU bioeconomy and providing investment certainty**, including by helping promising bio-based materials, products and technologies reach the market.
- **Ensuring a competitive and sustainable supply of biomass**, while promoting higher-value uses of biological resources and strengthening the role of primary producers.
- **Strengthening the EU's position in growing international markets** for bio-based materials, biomanufacturing and bio-based chemicals, including through EU external policy instruments.

For reporting purposes, the strategy is considered an enabling policy framework.

The environmental policy framework

The EU's overall environmental policy is guided by environment action programmes, which set the main priorities for EU action over a given period.

The eighth Environment Action Programme, which entered into force in May 2022, sets the EU's environmental priorities up to 2030. It covers six main areas, several of which are closely linked to climate action:

- reducing greenhouse gas emissions by at least 55% by 2030 and achieving climate neutrality by 2050;
- strengthening resilience and reducing vulnerability to the impacts of climate change;
- reducing the use of resources and accelerating the transition to a circular economy;
- reducing air, water and soil pollution, and protecting human health;
- protecting and restoring biodiversity and ecosystems; and
- reducing the environmental and climate impacts of production and consumption.

The European Commission reports annually on progress towards these objectives. A mid-term review completed in March 2024 found good progress in reducing greenhouse gas emissions, but concluded that faster reductions would be needed, particularly in the buildings and transport sectors. It also highlighted the need to increase carbon removals. A full evaluation of the programme will be carried out by 2029.

Policy framework for cities

The EU Covenant of Mayors for Climate and Energy brings together more than 12 000 local governments across the EU that voluntarily commit to ambitious climate and energy action.

Cities and other local authorities that join the Covenant commit to supporting the EU's 2030 climate target and to acting on both reducing greenhouse gas emissions and adapting to climate change. Within two years of joining, they are expected to prepare a sustainable energy and climate action plan setting out the main measures they intend to take. They also report regularly on their progress.

The Covenant is voluntary and is implemented through local action plans rather than legislation. For reporting purposes, it is therefore considered an enabling and coordination framework.

Since 2016, the EU Covenant of Mayors has also been part of the Global Covenant of Mayors for Climate and Energy, which brings together more than 13 000 local governments in over 140 countries.

3.5.2 Selection of key mitigation policies

Throughout this chapter, the EU has identified the policies and measures expected to have the greatest impact on greenhouse gas emissions or removals and on key categories in the greenhouse gas inventory.

The key mitigation policies for the EU are those that:

- are part of the Fit for 55 package; and
- are set up through legally binding EU legislation.

Table 7 identifies the main EU policies affecting key greenhouse gas inventory categories. It shows which inventory categories each policy affects and summarises its expected contribution to emission reductions or removals. More detailed descriptions and references are provided in the following sections of this chapter.

Table 7: Summary of the most significant policies

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
1 – Energy - stationary combustion & power generation	Carbon pricing	EU ETS revised Directive	Economic instrument	Implemented	1A1, 1A2, 1A3a, 1A3d 2 IPPU	CO_2	Primary carbon pricing instrument for power, industry, aviation and maritime transport. Reduces the cap to achieve 62% reduction vs 2005 in ETS sectors by 2030. Linear reduction factor increased from 2.2% to 4.3%/year. Phase-out of free allowances between 2026-2034. Highest impact measure across energy key categories	3.5.3 (page 84)
		EU ETS II for buildings, road and transport	Economic instrument	Adopted-operational as of 2028	1A3b, 1A4	CO_2	New separate emissions trading system cap targets 42% reduction in buildings and road transport covered by ETS2 by 2030 vs 2005. Absolute $MtCO_2$-eq trajectory to be confirmed once the ETS2 cap is finalised for 2027.	3.5.3 (page 87)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
	Renewable energy	EU Renewable Energy Directive (RED III) Directive (EU) 2023/2413	Regulatory (target setting)	Implemented	1A1, 1A2, 1A3, 1A4	CO_2, CH_4, N_2O, (indirect via fuel displacement)	Binding EU target of 42.5% renewable energy in gross final consumption by 2030. With sub-targets for industry (+1.6% per year), buildings (49% RE in heating and cooling), district heating (+2.2% per year) and transport (14.5% or 29% GHG intensity reduction). Cross-cutting high impact policy affecting multiple key categories. Contributes to the EC MIX scenario package-wide reduction but is not separately quantified in $MtCO_2$-eq.	3.5.3 (page 90)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
	Energy efficiency	Energy Efficiency Directive (EED)	Regulatory (target setting)	Implemented	1A1, 1A2, 1A4	CO_2, CH_4, N_2O	Binding EU primary energy consumption target of an 11.7% reduction by 2030. Price-induced market equilibrium system (PRIMES) projections of an annual energy savings obligation of 1.9% of final consumption for EU Member States. The 'energy efficiency first' principle made legally binding across policy planning. Affects all stationary combustion key categories. CH_4 is part of the package-wide contribution, and is not separately quantified in $MtCO_2$-eq.	3.5.4 (page 100)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
		Energy Performance of Buildings Directive (EPBD)	Regulatory	Implemented	1A4 (residential and commercial)	CO_2, CH_4,N_2O	All new buildings must be zero-emission by 2030 (public buildings from 2028). Minimum energy performance standards for worst-performing buildings. Phase-out of fossil-fuel-only boilers in new installations. The EPBD targets are expressed as primary-energy-use reductions for worst-performing building stock rather than stand-alone EU $MtCO_2$-eq.	3.5.4 (page 101)
2- ENERGY - Transport	Road transport	CO_2 standards for cars and vans	Regulatory – performance standard	Implemented	1A3b (road transport)	CO_2	100% CO_2 reduction target for new cars and vans by 2035. Combined with RED III renewable electricity targets, delivers life-cycle decarbonisation of the largest road transport sub-category - high impact.	3.5.5 (page 104)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
		CO_2 standards for heavy-duty vehicles	Regulatory (performance standard)	Implemented	1A3b (road transport)	CO_2	45% CO_2 reduction for new HDVs by 2030, 65% by 2035% and 90% by 2040 vs 2019. No separate assessment available.	3.5.5 (page 104)
		Alternative Fuels Infrastructure Regulation	Regulatory	Implemented	1A3b (road transport)	CO_2		3.5.5 (page 106)
	Aviation	ETS – Aviation	Economic instrument	Implemented	1A3a (aviation)	CO_2	Aviation ETS phase-out of free allowances for aviation; full auctioning by 2026, but not a stand-alone emissions cap.	3.5.3 (page 84)
		ReFuelEU Aviation	Regulatory	Implemented	1A3a (aviation)	CO_2	Mandatory sustainable aviation fuel (SAF) blending at EU airports: 2% (2025) rising to 70% by 2050. Life-cycle GHG savings depend on the SAF feedstock mix. No single EU-wide $MtCO_2$-eq.	3.5.5 (page 107)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
	Maritime transport	ETS – Maritime	Economic instrument	Implemented (phased from 2024)	1A3d (maritime)	CO_2	Phased inclusion of verified maritime CO_2 emissions 40% (2024), 70% (2025).	3.5.3 (page 84)
		FuelEU – Maritime	Regulatory GHG intensity standards	Implemented	1A3d (maritime)	CO_2, CH_4, N_2O	GHG intensity of energy used on board ships to fall 2% (2025), 6% (2030) and 80% (2050) vs a 2020 baseline. Absolute $MtCO_2$-eq savings not separately quantified by the EC impact assessment.	3.5.5 (page 108)
3 – Industrial processes and product use (IPPU)	Carbon pricing – Industrial ETS coverage	EU ETS – industrial coverage	Economic instrument	Implemented	2A, 2F(IPPU), 1A2	CO_2, N_2O, PFCs	Industrial installations are covered by the same overall EU ETS cap as above (62% reduction vs 2005 by 2030 across all ETS sectors). Industrial-only emissions were not assessed separately.	3.5.3 (page 84)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
		Carbon Border Adjustment Mechanism (CBAM)	Economic instrument	Implemented	2A, 2B, 2C (steel, cement, aluminium, fertilisers)	CO_2, N_2O, PFCs	Prevents carbon leakage as ETS free allowances are phased out (2026-2034) for sectors covered, thereby protecting the integrity of the EU ETS.	3.5.3 (page 91)
	Fluorinated gases	F-Gas Regulation	Regulatory (phase-down & prohibitions)	Implemented	2E, (electrical equipment), 2F (product use - refrigeration, AC, heat pumps)	HFCs, PFCs, SF_6, NF_3	Significantly accelerates HFC phase-down with consumption cut from a 2015 baseline of 176.7 by 2030. Introduces bans on high-global-warming-potential HFCs in specific applications. The impact assessment does not quantify the F-gases individually.	3.5.6 (page 110)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
4 – Agriculture	Governance – Binding national targets	Effort Sharing Regulation	Regulatory (binding national targets)	Implemented	2 IPPU, 3 (agriculture), 1A3b, 1A4, 5 (waste)	CH_4, N_2O, CO_2 (non ETS) HFCs PFCs SF_6 NF_3	EU-wide non-ETS target of 40% reduction by 2030 vs 2005. Sets binding annual GHG targets for each EU Member State in non-ETS sectors (agriculture, domestic, transport, waste, small industry) as a bloc not disaggregated to agriculture alone. The ESR is the governance mechanism obligating national action.	3.5.3 (page 88)
5 – Land use, land-use change and forestry	Land use	Revised LULUCF Regulation	Regulatory (binding national targets)	Implemented	4 (LULUCF – forestry, cropland, grassland, wetlands)	CH_4, N_2O, CO_2	Binding EU-level targets of 310 $MtCO_2$-eq. The net LULUCF sink is included in the 2030 target.	3.5.3 (page 95)

		Policy	Type	Status	CRT section	GHGs covered	Significance/expected impact	Reference
6 Waste and methane	Methane from energy sector and waste	EU Methane Regulation	Regulatory (reporting obligations)	Implemented	1B (fugitive emissions from oil, gas and coal)	CH_4,	It is complementary to Fit for 55. No binding EU-wide $MtCO_2$-eq target. Through the EU Methane Regulation combined with the assumptions of Fit for 55, 94.3% of methane emissions from the EU oil, gas, and coal sectors should be eliminated by 2030 from a 1990 baseline, representing a reduction of 6.2 Mt of methane emissions (183.7 $MtCO_2$-eq).	3.5.4 (page 102)
		Effort Sharing Regulation – waste sector coverage	Regulatory (national targets)	Implemented	5A (solid waste disposal), 5D (wastewater)	CH_4, N_2O,	Covered within the same 40% non-ETS ESR target above (waste sector). Waste-only emissions were not assessed separately.	3.5.3 (page 88)

3.5.3 Cross-cutting policies

The main EU cross-cutting measures under the 2030 climate and energy framework are the EU ETS and the Effort Sharing Regulation. These are supported by a broader set of EU policies that contribute to achieving the EU's climate targets.

EU Emissions Trading System

Key mitigation policy

Emissions covered by the EU Emissions Trading System (ETS) account for a bit less than 40% of the EU's total greenhouse gas emissions. The system covers more than 12 500 entities, including around 8 600 installations in the power and heat sector and manufacturing industry.

The ETS works on the 'cap-and-trade' principle. A cap is set for the total amount of certain greenhouse gases that may be emitted by the installations covered by the system. The cap is designed to reduce ETS emissions by 62% by 2030 compared with 2005. From 2024 to 2027, the cap decreases annually by 4.3% (the 'linear reduction factor') and from 2028 this annual reduction will increase to 4.4% per year.

The cap is expressed in allowances, which companies must surrender each year to cover their emissions. Companies primarily purchase allowances at auctions, which raise revenues for EU Member States to fund further climate action and energy transition. With the price of allowances set by the market, the EU ETS incentivises emission reductions where it costs the least to do so, in a technologically neutral way.

While auctioning is the primary method for distributing allowances in the EU ETS, a significant volume of allowances is allocated to installations for free to address the risk of carbon leakage. In certain industry sectors covered by the EU ETS (cement, aluminium, fertilisers, hydrogen, iron and steel), the Carbon Border Adjustment Mechanism (CBAM; see dedicated section below) will gradually replace free allocation from 2026 onwards. These sectors represent approximately 54% of total free allocation in 2021-2025.

The EU ETS is in operation in all 27 EU Member States and in Iceland, Liechtenstein and Norway. In Northern Ireland, it applies to electricity generation.

The system also covers aviation within the EU, Norway and Iceland, and departing flights to Switzerland and the United Kingdom. In parallel, the EU implements the international Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) through the EU ETS Directive. CORSIA is applied to relevant international flights outside the EEA, Switzerland and the UK between participating countries and requires EU-based aircraft operators to offset emissions above the scheme's baseline, which is 85% of 2019 emissions.

Cooperation with Iceland, Liechtenstein and Norway under the EEA agreement and with Northern Ireland under the Protocol on Ireland/Northern Ireland

The 27 European Union Member States, Iceland, Liechtenstein and Norway implement the EU Emissions Trading System (EU ETS) under Directive 2003/87/EC. The Directive was incorporated into point 21al into Annex XX of the Agreement on the European Economic Area (EEA Agreement), by Decision No 146/2007 of 26 October 2007 of the EEA Joint Committee. Electricity generators in Northern Ireland are covered under the Protocol on Ireland/Northern Ireland now referred to the Windsor Framework forming part of the EU-UK Withdrawal Agreement. This is without prejudice to how the EU, Iceland, Liechtenstein and Norway implement the Paris Agreement. The EU, Iceland, Liechtenstein, Norway and the United Kingdom each have separate NDCs under the Paris Agreement.

The EU ETS is a common policy and measure implemented by the participating Parties. It sets a single cap on issued allowances covering activities across participating jurisdictions. Iceland, Liechtenstein and Norway implement the relevant provisions of the EU ETS through their respective national legal frameworks.

Each Party reports greenhouse gas emissions occurring within its territory in its national greenhouse gas inventory, in accordance with the applicable IPCC guideline and describes its participation in the EU ETS among its policies and measures in its Biennial Transparency Report.

Since 2024, the system has also covered maritime transport. It covers 100% of emissions from voyages between EU ports and emissions within EU ports, and 50% of emissions from voyages between an EU port and a port outside the EU. The scope of the EU's NDC is narrower for maritime transport and includes only emissions from voyages inside the EU.

The EU ETS covers several greenhouse gases, depending on the activity:

- carbon dioxide (CO_2) from electricity and heat generation, energy-intensive industries, aviation and maritime transport;
- nitrous oxide (N_2O) from the production of certain chemicals and, from 2026, from maritime transport;
- perfluorocarbons (PFCs) from aluminium production; and
- from 2026, methane (CH_4) from maritime transport.

Emissions covered by the EU ETS are monitored, reported and independently verified.

Participation in the EU ETS is mandatory for companies covered by the system. In some sectors, only installations above specified size or production thresholds are covered.

Since 2024, larger municipal waste incinerators have also had to monitor, report and verify their emissions. However, they do not yet have to surrender allowances for these emissions.

The EU ETS Directive was adopted in 2003. It was revised in 2018 and again in 2023 as the EU stepped up its climate ambition. Most of the 2023 revisions entered into force in 2024:

- reducing the EU ETS cap to bring down emissions by 62% compared with 2005 levels by 2030;
- including emissions from maritime transport in the system;
- reducing and eliminating free allocation in the manufacturing industry and aviation;
- strengthening the Market Stability Reserve;
- introducing a new emissions trading system (ETS2) for buildings, road transport and other sectors from 2027;
- setting up the Social Climate Fund to address the social impacts of ETS2.

Recent policy developments

Putting in place the framework to deliver the 2040 target

In July 2026, the Commission adopted a proposal to update the EU Emissions Trading System (ETS) to create an even stronger engine for investment and innovation in Europe and to align its ambition with the EU's 2040 and 2050 climate targets.

The proposal adjusts the pace at which the ETS emissions cap declines after 2030. It gives industry a more gradual pathway but maintains a strong incentive to cut emissions. It also integrates high-quality permanent domestic carbon removals into the ETS, providing additional flexibility for sectors where emissions are particularly difficult to reduce. It proposes to continue free allocations of allowances and compensation for indirect carbon costs beyond 2030, with new requirements for companies to make tangible investments to decarbonise.

The proposal also significantly increases public support for industrial decarbonisation. A new Industrial Decarbonisation Bank will support the roll-out of clean technologies, aiming at EUR 100 billion in funding and starting with an Investment Booster backed by 400 million ETS allowances worth around EUR 30 billion for the first period up to 2030. Member States are also required to spend at least 50% of the auction revenues on investments in decarbonising the ETS sectors in the EU, giving better visibility and transparency of the use of ETS revenues.

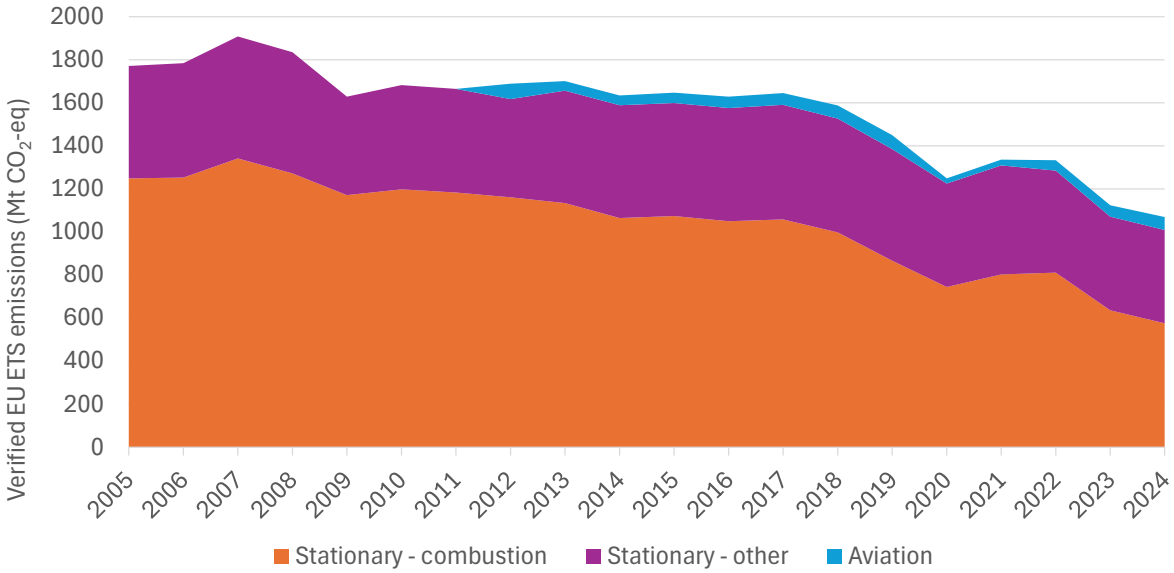
The proposal to update the ETS also aims to modernise the functioning and scope of the system. The Market Stability Reserve, which adjusts the supply of allowances when there is a large surplus or shortage in the market, would become more responsive as the ETS market becomes smaller. The proposal strengthens carbon pricing for aviation, including a wider coverage of international flights from 2029 and more support for sustainable aviation fuels. For maritime transport, it extends coverage to selected smaller ships, supports cleaner fuels and technologies. It proposes to gradually include municipal waste incineration in the ETS from 2031 to reach full coverage in 2034. The proposal includes further measures to simplify monitoring and reporting rules and to improve the incentives for carbon capture and use.

Proposals for the post-2030 national targets and flexibilities for the sectors outside the ETS are expected in the first quarter of 2027.

Trends in emissions

By the end of 2024, the EU ETS had helped drive down emissions from electricity and heat generation and industrial manufacturing by approximately 50% compared with 2005 levels (see Figure 28). With this progress, the system is on track to achieve the 2030 target of 62% reduction.

Figure 28: EU ETS emissions, 2005-2024



Source: European Environment Agency

In 2024, emissions from the power and industry sectors continued to decrease following a record annual drop in 2023 (see Table 8). Emissions from electricity and heat generation dropped by 10.7%, largely due to a substantial increase in the share of renewables and nuclear power in the electricity mix, coupled with a reduced reliance on major fossil fuels such as natural gas and coal. In 2024, renewables and biofuels were the leading source of electricity in the EU, capturing 47.2% of the share, with the overall renewable electricity output having increased by 7.6% in 2024. The drop in the power sector's emissions in 2024 marks a 30% reduction since 2021.

Emissions from industrial installations fell by 0.8% in 2024 compared with 2023. This reflected several factors, including lower production in some industrial sectors, a recovery in output in energy-intensive industries such as steel, fertilisers and chemicals, and improvements in energy efficiency.

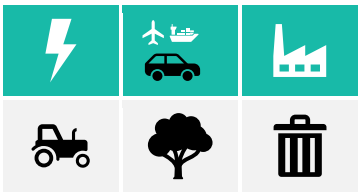
Table 8: Verified emissions data from the EU ETS

Year	All stationary installations ($MtCO_2$-eq)	Year-over-year change	Power and heat ($MtCO_2$-eq)	Industrial production ($MtCO_2$-eq)	Aviation emissions ($MtCO_2$-eq)
2019	1 530	-9.1%	822	708	68.2
2020	1 356 (1 253 excluding the UK)	-11.4%	696 (653 excluding the UK)	660 (601 excluding the UK)	25.2
2021	1 337	-1.4% (6.6% excluding the UK)	708	629	27.9
2022	1 313	-1.8%	725	589	49.5
2023	1 096	-16.5%	552	544	54.4
2024	1 033	-5.7%	493	540	62.6

Source: *Report on the functioning of the European carbon market in 2024*

Estimated mitigation impact

The EU ETS cap is reduced every year, with the aim of cutting emissions covered by the system by 62% by 2030 compared with 2005. This is equivalent to a reduction of around 1 300 $MtCO_2$-eq.



Sectors impacted

energy, transport (aviation and maritime), industry

EU Emissions Trading System 2

Key mitigation policy

In 2023, the EU introduced a new emissions trading system, ETS2, covering CO_2 emissions from road transport, buildings and additional sectors, i.e. mostly small industrial emitters that are not covered by the existing EU ETS.

Like the existing EU ETS, ETS2 is a 'cap-and-trade' system. However, the obligations apply to fuel suppliers rather than directly to households, drivers or other fuel users. Fuel suppliers must monitor and report emissions from the fuels they supply and, once the system becomes fully operational, surrender enough allowances to cover these emissions.

Carbon pricing under ETS2 will create an incentive to reduce fossil fuel use and invest in solutions such as building renovation and low-emission mobility. The ETS2 cap is designed to reduce emissions by 42% by 2030 compared with 2005 levels. Part of the revenues will finance the Social Climate Fund, while EU Member States must use their remaining revenues for climate action and social measures. This will help reduce the social impacts of carbon pricing and support those most affected by higher energy and transport costs.

Implementation is taking place in stages. Monitoring and reporting started on 1 January 2025**.** Regulated entities must have a greenhouse gas emissions permit and an approved monitoring plan and must report their emissions for the previous year. From 2026, those emissions must be verified by an accredited verifier.

The start of the carbon pricing and compliance obligations was postponed from 2027 to 2028. From 2028, regulated entities will have to surrender enough allowances to cover their verified emissions. To support market liquidity before the system starts, an additional 30% of allowances will be auctioned during 2027.

This means that monitoring and reporting are already under way, while the obligation to buy and surrender allowances will start in 2028.

ETS2 complements the Effort Sharing Regulation, which sets binding national emission-reduction targets for EU Member States. ETS2 emissions, notably from road transport and buildings, are also covered by the ESR. By putting a carbon price on these emissions, ETS2 will help the EU achieve the ESR target, alongside other policies.

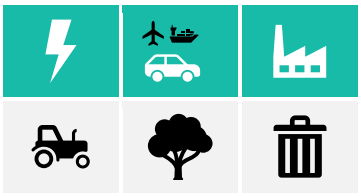
Recent policy developments

Adjustment to the Emissions Trading System 2

In November 2025, the Commission proposed targeted adjustments to the Market Stability Reserve for the EU's emissions trading system (ETS2) for additional sectors including buildings and road transport and small industry not covered by ETS1. The aim of these adjustments is to prevent severe price volatility, protect consumers from high fuel and heating costs and support a smoother start to the ETS2 in 2028. The proposal was adopted in October 2026.

Estimated mitigation impact

The ETS2 cap will be set in such a way as to bring emissions down by 42% by 2030 compared with 2005 levels.



Sectors impacted
energy, transport (road transport), industry

Effort sharing legislation

Key mitigation policy

The Effort Sharing Regulation (ESR) covers greenhouse gas emissions from domestic transport, buildings, agriculture, small industry and waste. Together, these emissions account for 66% of the EU's domestic emissions.

The ESR sets the EU target to reduce emissions in the effort sharing sectors by 40% by 2030 compared with 2005 levels. This overall target translates into national targets for 2030 ranging from 10% to 50% reductions and greenhouse gas emissions limits from 2021 to 2030, expressed in annual emission allocations. The ESR recognises that the EU Member States have different capacities to act and therefore differentiates their targets according to GDP per capita. This ensures fairness, as higher-income EU Member States take on more ambitious targets than lower-income Member States. However, an approach based solely on relative GDP per capita would mean that some EU Member States would have relatively high costs for reaching their targets. To address this, targets are adjusted to reflect cost-effectiveness for those EU Member States with an above-average GDP per capita.

The ESR includes several flexibilities. EU Member States have limited flexibility to shift annual emission allocations across years. If emissions in a given year are below the annual emission allocation, part of the unused allocation may be carried forward for use in subsequent years ('banking'). Conversely, under specific conditions and within prescribed limits, EU Member States may use a portion of future annual emission allocations for compliance in an earlier year ('borrowing'). These flexibilities help address year-to-year fluctuations in emissions while ensuring achievement of the overall 2030 emissions reduction target.

Nine EU Member States (Belgium, Denmark, Ireland, Luxembourg, Malta, the Netherlands, Austria, Finland, Sweden) can use a limited amount of ETS allowances to offset emissions in the effort sharing sectors. EU Member States have the possibility to transfer emission allocations among each other by adjusting their emission limits by an equivalent amount. The ESR allows for a limited use of land-based removal credits from the LULUCF sector, thereby creating a link between emission reductions and LULUCF removals at EU Member State level. In return, the LULUCF Regulation allows for an unlimited use of surplus emission reductions from the ESR in the LULUCF sector.

Based on the latest available data, EU-wide ESR emissions are projected to fall by 38.5% by 2030 compared with 2005, slightly short of the 40% reduction target (see Table 9). However, over the full 2021-2030 period, some EU Member States are expected to generate surplus annual emission allocations. Through the available flexibilities, these surpluses could allow all EU Member States to comply with their ESR obligations.

Cooperation with Iceland, Liechtenstein and Norway under the EEA agreement and with Northern Ireland under the Protocol on Ireland/Northern Ireland

Under the ESR, Iceland and Norway may transfer to, or acquire from, EU Member States annual emission allocations. So far, no such transfers have been carried out. Similarly, under the LULUCF, Iceland and Norway may transfer land removal units to and from EU Member States. Transfers of these LULUCF credits may take place during the compliance exercise in 2027.

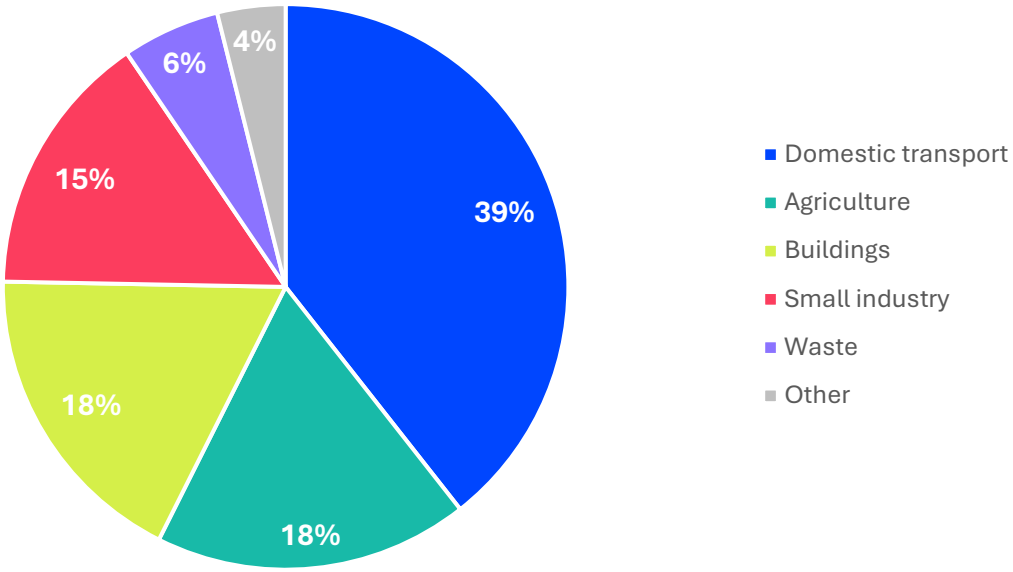
Table 9: Projected emissions under the ESR

Year / scenario	Emissions ($MtCO_2$-eq)	Reduction (%)
EU 2005 base year	2 454.4	-
EU 2030 (with additional measures)	1 547.4	-38.5%
EU 2030 (with existing measures)	1 721.8	-31.6%

In 2024, according to final inventory data, emissions from sectors under the ESR remained at a similar level compared with 2023 (-0.3%). They were 6.4% lower than in 2021 and were 20.6% lower than in 2005. At sectoral level from 2023 to 2024, emissions

from domestic transport increased by 1.2%, while emissions from the other effort sharing sectors decreased by 1-2%. In 2024, transport was the largest effort sharing sector, accounting for 39.4% of the EU's ESR emissions, followed by buildings (17.9%), agriculture (18%), small industry (15.2%), waste (5.6%), and other (3.9%).

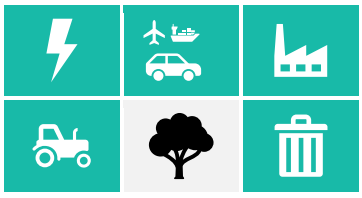
Figure 29: ESR emissions by sector (2024)



Note: Category Other includes 1.A.4.c (Fuel combustion - Agriculture/forestry/fishing), 1.A.5 (Fuel combustion - Other), and 6 (Other)

Estimate of mitigation impact

The ESR sets the EU target to reduce emissions in the effort sharing sectors by 40% by 2030 compared with 2005 levels. This is equivalent to 982 $MtCO_2$-eq.



Sectors impacted

energy, transport, industry, agriculture, waste

Renewable Energy Directive

Key mitigation policy

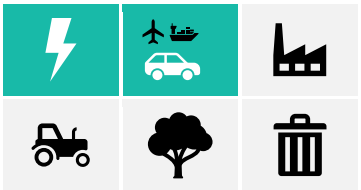
The Renewable Energy Directive is the main EU law promoting renewable energy. Its latest revision, adopted in 2023, sets a binding EU target of at least 42.5% renewable energy in gross final energy consumption by 2030, with the goal of reaching 45%.

The Directive supports the use of renewable energy across the economy. It sets specific targets and requirements for transport, industry, heating and cooling, buildings, and district heating and cooling. It also promotes the use of renewable hydrogen and other renewable fuels in sectors where direct electrification is more difficult.

To speed up deployment, the Directive simplifies and shortens permitting procedures for renewable energy projects and related infrastructure. It also strengthens sustainability requirements for bioenergy to ensure that its use delivers environmental and climate benefits. Together, these measures aim to replace fossil fuels, increase electrification and accelerate the expansion of renewable energy across the EU.

Estimated mitigation impact

A stand-alone greenhouse gas reduction estimate is generally not attributed to the Renewable Energy Directive because renewable energy deployment interacts closely with other measures, including the EU ETS, energy-efficiency policies, electrification of end-use sectors and national climate policies.
Renewable energy is modelled within the integrated Fit for 55 core scenarios, all of which will achieve the 55% net greenhouse gas target in 2030, with renewable energy accounting for 38-40% of gross final energy consumption. Renewable fuels contribute to greenhouse gas savings by displacing fossil fuels in the energy system and are not attributed a stand-alone CO_2-eq estimate; renewables are nonetheless a precondition for the reductions attributed to the EU ETS and the energy-efficiency instruments.



Sectors impacted
energy, transport (road transport)

Carbon Border Adjustment Mechanism

Key mitigation policy

The Carbon Border Adjustment Mechanism was set up in 2023 as part of the EU's climate policy. It puts a carbon price on selected carbon-intensive goods imported into the EU, reflecting the carbon price that would have been paid if the goods had been produced under the EU ETS. It aims to prevent carbon leakage and encourage cleaner production outside the EU. It currently covers cement, iron and steel, aluminium, fertilisers, electricity and hydrogen.

The mechanism was introduced gradually. During the transitional period from October 2023 to the end of 2025, importers were required to report the emissions embedded in imported goods, but no financial payments were required. The definitive regime has applied since January 2026.

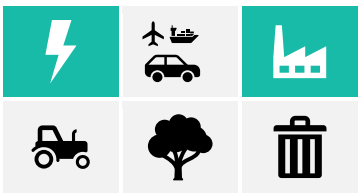
Under the definitive regime, large importers must report the emissions embedded in their imports and surrender certificates corresponding to those emissions. The price of the certificates is linked to the EU ETS carbon price. If a carbon price has already been paid in the country of production, that can be taken into account. Emissions can be calculated using default values or actual verified data, where available.

The review of the transitional period found that around 156 million tonnes of goods covered by the EU ETS were reported between the fourth quarter of 2023 and the second quarter of 2025. Iron and steel accounted for 69% of this volume, followed by fertilisers at 15%, cement at 11% and aluminium at 5%.

Estimate of mitigation impact

No quantified estimate of mitigation impact is provided for CBAM. Unlike the EU ETS and ETS2, CBAM does not set an emissions cap. Its primary objective is to prevent carbon leakage by ensuring that imported goods face a carbon cost comparable to that borne by EU producers under the EU ETS. In simple terms, CBAM's effect is primarily to prevent emissions shifting outside the EU rather than to reduce emissions by a specified amount within a capped sector.

The mitigation impact of CBAM depends on behavioural responses by producers and trading partners including future trade patterns, carbon pricing in countries outside the EU, and technology developments and deployments. This means that the mitigation impact cannot be robustly quantified *ex ante* separately from the broader impact of EU climate policies.



Sectors impacted
energy, industry

Net-Zero Industry Act

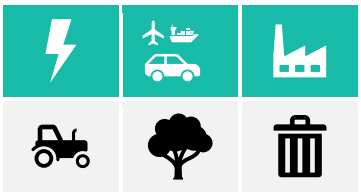
The Net-Zero Industry Act entered into force in June 2024. It is part of the Green Deal Industrial Plan and aims to increase the production of clean technologies in the EU. This should help support the clean energy transition and reduce the EU's dependence on technologies and components from outside the EU.

The act sets benchmarks for EU manufacturing capacity. By 2030, EU manufacturing should approach or reach at least 40% of the annual deployment needs for strategic net-zero technologies. By 2040, the EU aims to reach 15% of global production. The Act covers a wide range of technologies, including solar and wind, batteries and storage, heat pumps, hydrogen, carbon capture and storage, electricity grids and technologies for industrial decarbonisation.

By increasing the availability of clean technologies, it can support emission reductions in industry, energy and other sectors. It also sets an EU objective of at least 50 million tonnes of annual CO_2 injection capacity by 2030 to support carbon capture and storage.

Estimated mitigation impact

No independent emission reductions expected *ex ante* are attributed to the Act. It is considered an enabling framework rather than a measure with a directly quantifiable mitigation impact.



Sectors impacted
energy, transport, industry

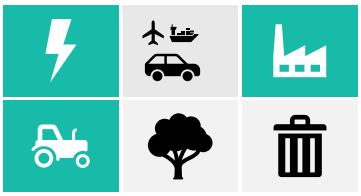
Industrial Emissions Directive

The Industrial Emissions Directive is the main EU law regulating pollution from large industrial installations. It was adopted in 2010 and substantially revised in 2024. The revised rules broadened the coverage of intensive pig and poultry farms and included metal mining and large-scale battery production. The Directive requires the industrial installations covered to operate under environmental permits based on best available techniques. These aim to reduce emissions to air, water and land, and to improve the use of energy, water and materials. The 2024 revision also gives greater attention to resource efficiency, circularity and industrial decarbonisation.

The Directive mainly regulates pollutants – rather than greenhouse gas emissions – directly. However, it can also help reduce greenhouse gas emissions through better energy and resource efficiency, cleaner industrial processes and measures addressing emissions from activities such as landfills and livestock farming. Its climate impact therefore complements policies such as the EU ETS. In addition, the Directive includes measures and more flexible permitting to support the development and faster uptake of innovative decarbonisation techniques.

Estimate of mitigation impact

The effect of the Directive on CO_2 emissions is mostly indirect and cannot be quantified. No stand-alone *ex ante* estimate of greenhouse gas emission reductions has been attributed to the Directive. It is generally treated as an enabling/regulatory framework rather than a measure with a stand-alone quantified mitigation estimate. The Directive contributes indirectly to climate-change mitigation through the application of best available techniques, improved resource and energy efficiency, pollution prevention measures and support for industrial decarbonisation.



Sectors impacted
energy, industry, agriculture

Carbon Capture and Storage Directive

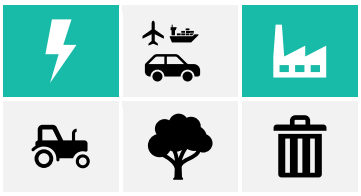
Some industrial emissions, such as those from cement production, are difficult to eliminate completely. Carbon capture and storage can help reduce these emissions by capturing CO_2 and storing it permanently underground.

The Carbon Capture and Storage Directive provides the EU legal framework for the safe geological storage of CO_2. It covers the full lifetime of storage sites and includes rules relevant to CO_2 capture and transport. The Directive enables the development of carbon capture and storage projects but does not set emission reduction targets. Its climate impact depends on the number and scale of projects implemented.

Estimate of mitigation impact

No stand-alone estimate of greenhouse gas emission reductions is available for the Directive. It provides the legal framework for safe geological storage of carbon dioxide and enables carbon capture and storage projects. The actual emission

reductions depend on the individual installations and projects that use carbon capture and storage.



Sectors impacted
energy, industry

LULUCF Regulation

Key mitigation policy

The LULUCF Regulation, first adopted in 2018 and amended in 2023, sets the core EU framework for emissions and removals from land use, land-use change and forestry (LULUCF). The revised Regulation sets an EU-wide target to increase land-based net removals by an additional 42 $MtCO_2$-eq by 2030 compared with the 2016-2018 reference period. It translates into an EU-wide net removal target of 310 $MtCO_2$-eq by 2030.

For 2021-2025, specific accounting rules apply for different land accounting categories, taking account of historical benchmarks such as the forest reference level. EU Member States are to follow the 'no-debit' rule, meaning that accounted emissions must not exceed accounted removals.

For 2026-2030, reporting has been simplified with the abolition of the accounting rules and corresponding benchmark. The additional −42 $MtCO_2$-eq target covers all LULUCF reporting categories and is distributed among EU Member States through individual targets, based on their share of total managed land area. The national 2030 targets require each EU Member State to increase its climate ambition and implement additional agriculture and forestry policies.

The scope of the revised Regulation has also been extended to cover all managed land from 2026 onwards. The revised Regulation is also intended to improve monitoring, reporting and verification and to strengthen synergies between climate mitigation and environmental protection.

Cooperation with Iceland, Liechtenstein and Norway under the EEA agreement and with Northern Ireland under the Protocol on Ireland/Northern Ireland

Regulation (EU) 2018/841 (LULUCF) and Regulation (EU) 2018/842 (ESR) have been implemented by Iceland and Norway (without the participation of Liechtenstein) in cooperation with the EU 27 since 2019. They were incorporated in Protocol 31 of the EEA Agreement by Decision 269/2019 of the EEA Joint Committee.

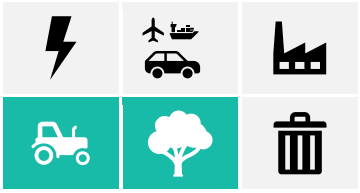
Iceland and Norway participate in the Effort Sharing instrument, with national targets for the reduction of emissions in the ESR sectors by 2030. Under LULUCF, the cooperation concerns enhancement of carbon removals generated by their LULUCF sectors. The cooperation of Iceland and Norway has been taking place under the conditions of the ESR and LULUCF Regulations as adopted in 2018. Currently, it is being reviewed and updated following the 2023 amendments of both pieces of legislation which increased the ambition of the 2030 national targets.

Under the ESR, Iceland and Norway may transfer to, or acquire from, EU Member States annual emission allocations. So far, no such transfers have been carried out. Similarly, under the LULUCF, Iceland and Norway may transfer land removal units to and from EU Member States. Transfers of these LULUCF credits may take place during the compliance exercise in 2027.

Estimated mitigation impact

The revised LULUCF Regulation sets an EU-wide target to increase net removals in the land sector to 310 $MtCO_2$-eq by 2030, corresponding to an increase of approximately 42 $MtCO_2$-eq compared with the average level of net removals during 2016-2018. The target is implemented through binding national contributions and represents one of the central components of the EU's strategy to achieve the economy-wide target of reducing net greenhouse gas emissions by at least 55% by 2030 relative to 1990 levels. The Regulation seeks to reverse the recent decline in the EU land sink through improved land management, restoration of carbon-rich ecosystems, sustainable forest management and strengthened monitoring and reporting systems.

The realised mitigation impact will depend on EU Member States' implementation of agriculture and forestry measures, future harvesting levels, land-use decisions, and the impacts of climate change and natural disturbances such as droughts, storms, wildfires and pest outbreaks. While the Regulation sets legally binding targets for removals, actual outcomes remain sensitive to biophysical conditions and the resilience of forest and soil carbon stocks.



Sectors impacted
agriculture, land use

Carbon removals and carbon farming

The Carbon Removals and Carbon Farming Regulation, adopted in 2024, sets up a voluntary EU framework for certifying high-quality carbon removals, carbon farming and carbon storage in products. It sets common rules to ensure that certified activities are properly measured, monitored and independently verified. It also includes requirements on additionality, long-term storage and sustainability.

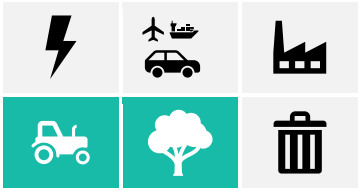
Certification covers three main types of activities.

- **Permanent carbon removals**, where atmospheric or biogenic carbon is captured and stored for centuries. This includes direct air capture with carbon storage, capture and storage of biogenic emissions, and biochar.
- **Carbon farming**, including practices that increase carbon storage or reduce soil emissions. Examples include afforestation, agroforestry, improved soil management and the rewetting of peatlands.
- **Carbon storage in products**, where atmospheric or biogenic carbon is stored for at least 35 years in long-lasting products.

The European Commission has adopted certification methodologies for permanent carbon removals and for selected carbon farming activities. Further methodologies, including for carbon storage in products, will be developed gradually.

Estimated mitigation impact

No quantified mitigation impact has been estimated for the Regulation. It sets up a certification framework for carbon removals and carbon storage activities but does not impose quantitative removal targets. Its impact depends on future uptake of certified activities and implementation of certification methodologies. It is therefore classified as an enabling measure.



Sectors impacted
agriculture, land use

EU taxonomy for sustainable activities

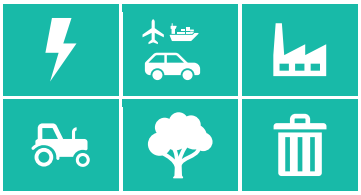
The EU taxonomy for sustainable activities is a classification system that defines which economic activities can be considered environmentally sustainable. It gives companies, investors and public authorities a common definition of sustainable activities, making financial markets more transparent and reducing the risk of greenwashing. It also helps investors and consumers identify more sustainable options and direct their money towards activities that support the green transition.

The taxonomy is mainly used by **large companies and financial market participants**. Companies covered by EU sustainability reporting rules disclose how much of their business and investment is linked to activities that are in line with the EU Taxonomy Regulation. Financial institutions and investment funds use the taxonomy to report the extent to which their investments support such activities, while investors can use this information to compare investment opportunities. Following recent simplification of EU sustainability reporting rules, mandatory reporting is increasingly focused on the largest companies.

An activity is in line with the EU Taxonomy Regulation if it contributes substantially to at least one of the EU's six environmental objectives, does no significant harm to the other objectives, meets minimum safeguards and complies with detailed technical criteria. While the taxonomy **does not require companies or investors to invest only in sustainable activities**, it provides a common way to identify and report such activities.

Estimated mitigation impact

The Taxonomy Regulation supports emission reductions indirectly by helping to direct investment towards activities that contribute to climate change mitigation. It provides a common definition of environmentally sustainable activities, improves transparency for investors and helps reduce greenwashing. Its greenhouse gas impact cannot easily be quantified separately, as actual emission reductions depend on the investments and projects that use the taxonomy framework.



Sectors impacted
energy, transport, industry, agriculture, land use, waste

The Energy Taxation Directive

The Energy Taxation Directive sets out EU rules for the minimum taxation of energy products, such as motor fuel, heating fuel and electricity.

However, since its adoption in 2003, energy markets and technologies in the EU have undergone significant developments, and the EU's international commitments, including the Paris Agreement, and its regulatory framework on energy and climate change, have evolved considerably.

In July 2021, the European Commission adopted a proposal for a revision of the Directive. The revision seeks to align the taxation of energy products with EU energy and climate policies, promote clean technologies and remove outdated exemptions and reduced rates that currently encourage the use of fossil fuels. The main changes proposed include the following.

- Fuels will be taxed according to their energy content and environmental performance rather than their volume. This will better reflect the environmental impact of individual fuels, helping businesses and consumers to make cleaner, more climate-friendly choices.
- The classification of energy products for taxation purposes will be simplified to ensure that the most environmentally harmful fuels are taxed the most. Products covered by the Directive are grouped and ranked according to their environmental performance. Fuels that have the greatest negative impact on the environment will be subject to higher minimum rates.
- Exemptions for certain products and home heating will be phased out so that fossil fuels can no longer be taxed below the minimum rates. EU Member

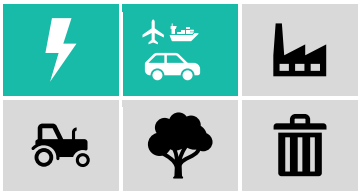
States will be able to support vulnerable households and protect people against energy poverty.

- Fossil fuels used in aviation, shipping and fishing should no longer be fully exempt from energy taxation in the EU; this is a crucial measure given the role of those sectors in energy consumption and pollution.

The proposal is currently being discussed by the EU Member States and the European Parliament. It has therefore not yet been adopted and is not yet in force.

Estimated mitigation impact

No stand-alone quantified estimate of greenhouse gas emission reductions is attributed to the Energy Taxation Directive or to the proposed recast. The Directive sets up a framework for the taxation of energy products and electricity. Its contribution to emission reductions depends on EU Member States' tax implementation and on behavioural responses by consumers and businesses. The proposed revision is intended to strengthen incentives for low-carbon energy use and energy efficiency, but no single EU-wide *ex ante* mitigation estimate is available for the Directive as a whole.



Sectors impacted
energy, transport

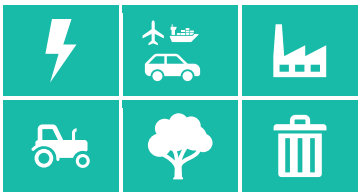
Corporate Sustainability Reporting Directive

The Corporate Sustainability Reporting Directive, which came into force in January 2023, requires all large companies and all listed companies (except microenterprises) to disclose information on how external sustainability factors (such as climate change) influence their activities and how their activities affect people and the environment, including the climate. This helps investors, consumers and other stakeholders to evaluate the sustainability performance of companies. The Directive strengthens the existing rules introduced by the Non-Financial Reporting Directive and ensures alignment with other sustainable finance initiatives.

The Directive expands sustainability reporting to more companies and introduces common EU reporting standards. Companies covered by the rules must report on environmental, social and governance issues, including climate change and the circular economy. The first companies started reporting under the new rules in 2025 for the 2024 financial year.

Estimated mitigation impact

No stand-alone *ex ante* estimate of greenhouse gas emission reductions has been attributed to the Corporate Sustainability Reporting Directive. The Directive does not set emission limits or emission reduction targets. Instead, it requires companies to disclose information on sustainability-related impacts, risks, opportunities, transition plans, targets and greenhouse gas emissions using harmonised reporting standards. The Directive is therefore considered an enabling measure that supports climate action indirectly by improving transparency, comparability and availability of sustainability-related information for investors, consumers, financial institutions and other stakeholders. It is expected to contribute to emission reductions through improved corporate governance, investment decisions and implementation of decarbonisation strategies by reporting entities. However, these effects cannot be robustly quantified separately from other climate and sustainable finance policies.



Sectors impacted

energy, transport, industry, agriculture, land use, waste

3.5.4 Energy sector

The energy system is at the centre of the EU's climate action, as fuel combustion for energy accounts for around 75% of the EU greenhouse gas emissions. EU energy policy combines three main objectives: sustainability, security of supply and competitiveness.

The Fit for 55 package strengthened EU energy legislation to support the target of reducing net greenhouse gas emissions by at least 55% by 2030 compared with 1990. This includes a binding renewable energy target of at least 42.5% by 2030, with the goal of reaching 45%, and stronger energy-efficiency requirements.

Since 2022, energy security has become a major priority following Russia's full-scale invasion of Ukraine, and the resulting disruption of energy supplies and sharp increase in energy prices. The REPowerEU Plan was introduced to reduce the EU's dependence on Russian fossil fuels through energy savings, diversification of supplies and faster deployment of renewable energy. The Action Plan for Affordable Energy, adopted in 2025, focuses further on lowering energy costs, strengthening grids and expanding clean electricity.

The transition also requires a more integrated and flexible energy system. The EU Strategy for Energy System Integration sets out measures to better connect electricity, heating and cooling, fuels and end-use sectors such as buildings, transport and

industry. The European Grids Package supports the expansion and modernisation of electricity grids, which is essential for greater electrification and the rapid deployment of renewable energy. The EU Hydrogen Strategy complements these efforts by supporting renewable hydrogen, particularly in sectors where direct electrification is difficult.

The transition is already visible. In 2024, renewables accounted for around 47% of EU electricity generation, while emissions from electricity and heat production were around 58% below 1990 levels. Further reductions are expected from the continued expansion of renewable energy, lower use of fossil fuels and improvements in energy efficiency.

Cross-cutting measures relevant to the energy sector (see Table 10), including the EU ETS and the new emissions trading system for buildings, road transport and small industry, are described in the relevant cross-cutting sections. The main sector-specific policies are described in this section.

Table 10: Cross-cutting policies in energy

Policy	Effect on sector
Emissions Trading System 1	Direct effect
Emissions Trading System 2	Direct effect
Effort Sharing Regulation	Direct effect
Renewable Energy Directive	Direct effect
Carbon Border Adjustment Mechanism	Direct effect
Net-Zero Industry Act	Direct effect
Industrial Emissions Directive	Direct effect
Carbon Capture and Storage Directive	Direct effect
EU taxonomy for sustainable activities	Indirect effect
The Energy Taxation Directive	Direct effect
Corporate Sustainability Reporting Directive	Indirect effect

The Energy Efficiency Directive

Key mitigation policy

The Energy Efficiency Directive is the main EU law on energy efficiency. The revised Directive, adopted in 2023, significantly increased the EU's ambition and strengthened the principle of 'energy efficiency first'. This means that energy efficiency must be considered in relevant policy, planning and major investment decisions in both energy and non-energy sectors.

The Directive sets a binding EU target to reduce energy consumption by at least 11.7% by 2030 compared with the 2020 EU reference scenario. This means that EU final energy consumption should not exceed 763 Mtoe in 2030, while primary energy consumption should not exceed 992.5 Mtoe.

It also strengthens annual energy-saving requirements, which will rise from 1.3% in 2024-2025 to 1.9% from 2028. The public sector must reduce its energy consumption by 1.9% each year, while 3% of public buildings must be renovated annually. The Directive also introduces stricter requirements for large energy users, data centres, heating and cooling, and measures to support people affected by energy poverty.

By reducing energy demand, the Directive helps lower greenhouse gas emissions, energy costs and dependence on fossil fuels. Energy efficiency is particularly important because it reduces the amount of clean energy and infrastructure needed to decarbonise the economy.

Estimated mitigation impact

Full implementation of the Energy Efficiency Directive will help reduce greenhouse gas emissions by lowering energy demand across the economy.
However, its impact cannot easily be quantified separately. The Directive works together with other Fit for 55 policies, including carbon pricing, renewable energy measures and the Energy Performance of Buildings Directive.
The impact assessment therefore assesses the combined effect of all these policies rather than providing a stand-alone estimate for the Energy Efficiency Directive. The modelled scenarios indicate additional greenhouse gas reductions of around 250-300 $MtCO_2$-eq per year by 2030 across the EU economy for the policy package.
Full implementation of the 2030 targets implies a reduction of 183 $MtCO_2$-eq in final energy consumption relative to 2024 levels (or 229 $MtCO_2$-eq against the 2020 reference scenario baseline).

Energy Performance of Buildings Directive



Key mitigation policy

The revised Energy Performance of Buildings Directive, which entered into force in May 2024, sets a pathway towards a zero-emission building stock by 2050. It aims to reduce emissions from buildings by at least 60% by 2030 compared with 2015.

The Directive strengthens energy performance requirements, including measures to renovate the worst-performing buildings and a zero-emission standard for new buildings. It also supports better energy performance certificates, renovation planning, solar energy and recharging infrastructure.

Beyond its climate benefits, building renovation can also bring wider social and economic benefits. It can lower energy bills, reduce energy poverty, create jobs and support investment in the renovation sector.

Estimated mitigation impact

According to the impact assessment, the revised Directive could reduce emissions by around 38 $MtCO_2$-eq by 2030. It could also cut greenhouse gas emissions from space heating, cooling and hot water by 22.8% by 2030. Without the Directive, the buildings sector would achieve only around half of the emission reductions needed to meet the EU's 2030 climate target.

Energy labelling and ecodesign

EU energy labelling and ecodesign rules improve the energy efficiency of products sold in the EU. Energy labels use an A-to-G scale to help consumers compare products and choose more efficient ones. Ecodesign rules set minimum energy-efficiency requirements and prevent the least efficient products from being placed on the market.

These measures are being extended through the Ecodesign for Sustainable Products Regulation, adopted in 2024. It extends the possible scope to a much wider range of products and covers broader sustainability aspects beyond energy efficiency. (See also Sustainable products).

Estimated mitigation impact

Ecodesign and energy-labelling measures are estimated to have reduced greenhouse gas emissions from households by 152 $MtCO_2$-eq in 2024, with reductions expected to rise to 160 $MtCO_2$-eq in 2030. Primary energy savings are expected to increase from 1 162 TWh in 2024 to 1 525 TWh in 2030.

Methane Regulation

Key mitigation policy

Methane is the second most important greenhouse gas after carbon dioxide and offers significant potential for reducing emissions in the short to medium term. Building on the EU methane strategy, the Methane Regulation, adopted in 2024, addresses methane emissions from the energy sector.

It strengthens the measurement, reporting and verification of methane emissions, requires regular leak detection and repair, and restricts venting and flaring. EU Member States must also address emissions from abandoned coal mines and inactive oil and gas wells. The Regulation also introduces methane monitoring and performance requirements for imported crude oil, natural gas and coal, extending its impact beyond emissions occurring within the EU.

Estimated mitigation impact

The impact assessment estimates that the Methane Regulation combined with the broader assumptions of Fit for 55 will reduce methane emissions from the EU energy sector by 79 % by 2030 compared with 2020, or 94% compared to 1990.. It also targets methane emissions associated with the EU's coal, oil and gas imports, which should additionally reduce global energy methane emissions outside of the EU by an estimated 56.6 $MtCO_2$-eq by 2030.

3.5.5 Transport sector

In 2024, transport – including international aviation and maritime transport – accounted for 35% of total EU greenhouse gas emissions. After six years of steady growth, transport emissions fell sharply in 2020 due to reduced activity during the COVID-19 pandemic. They have increased again since 2021. Transport remains the only major sector where emissions are higher (by 28%) than in 1990[22].

To accelerate the decarbonisation of transport and to achieve the EU's climate targets, a range of cross-cutting (see Table 11) and sector-specific policies are already in place or under preparation. Sector-specific policies are described in the following sections.

Table 11: Cross-cutting policies in transport

Policy	Effect on sector
Emissions Trading System 1	Direct effect
Emissions Trading System 2	Direct effect
Effort Sharing Regulation	Direct effect
Renewable Energy Directive	Direct effect
Net-Zero Industry Act	Direct effect
EU taxonomy for sustainable activities	Indirect effect
The Energy Taxation Directive	Direct effect
Corporate Sustainability Reporting Directive	Indirect effect

These policies are guided by the Sustainable and Smart and Mobility Strategy and its action plan. The strategy sets out a roadmap for transforming the EU transport system and supporting the European Green Deal objective of reducing transport emissions by 90% by 2050 compared with 1990.
It promotes cleaner vehicles, vessels and aircraft, greater use of renewable and low-carbon fuels, more sustainable urban and long-distance mobility, greener freight

[22] EEA greenhouse gases – data viewer, https://www.eea.europa.eu/en/analysis/maps-and-charts/greenhouse-gases-viewer-data-viewers.

transport and better transport infrastructure. It also supports digitalisation, innovation and a more resilient and accessible transport system.

The strategy includes milestones for 2030, 2035 and 2050, such as increasing the number of zero-emission vehicles, expanding high-speed rail and rail freight, and completing a sustainable and multimodal Trans-European Transport Network.

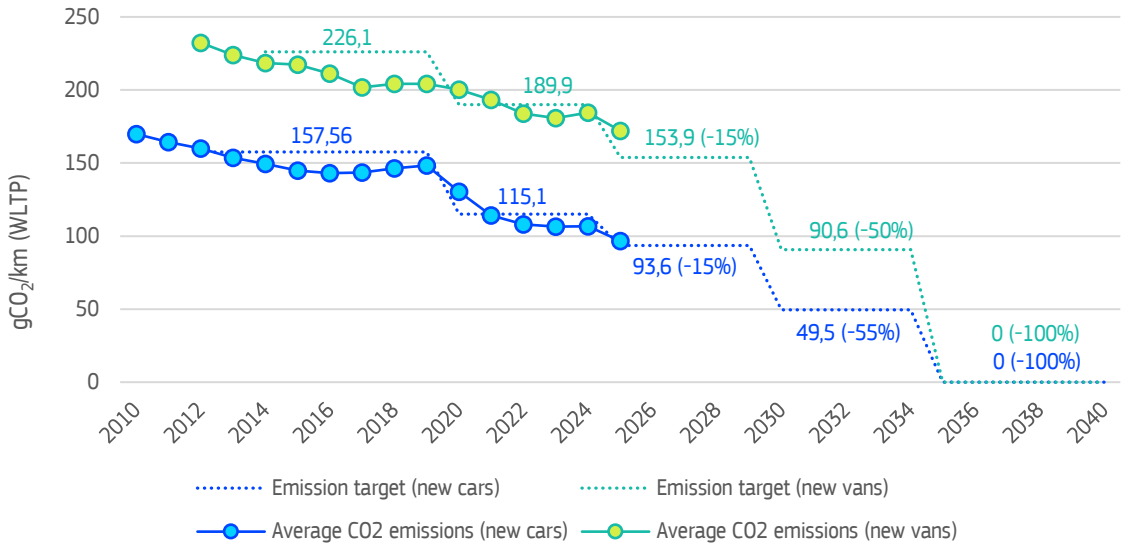
Emission standards for cars

Key mitigation policy

The main EU policies for reducing CO_2 emissions from road transport are the CO_2 emission standards for new cars and vans, and for new heavy-duty vehicles, such as lorries, buses and coaches. The standards apply only to newly registered vehicles, not to vehicles already on the road. EU-wide reduction targets are translated into annual targets for each manufacturer or group of manufacturers. Compliance is assessed on the basis of the average emissions of all new vehicles registered by that manufacturer in a given year or multi-year period, rather than those of each individual vehicle.

The targets become stricter over time, encouraging manufacturers to improve vehicle efficiency and increase the share of zero-emission vehicles. Separate targets apply to cars and vans (see Figure 30) and to different types of heavy-duty vehicles (see Figure 31), including lorries, buses and coaches.

Figure 30: CO_2 emissions and emission targets for cars and vans



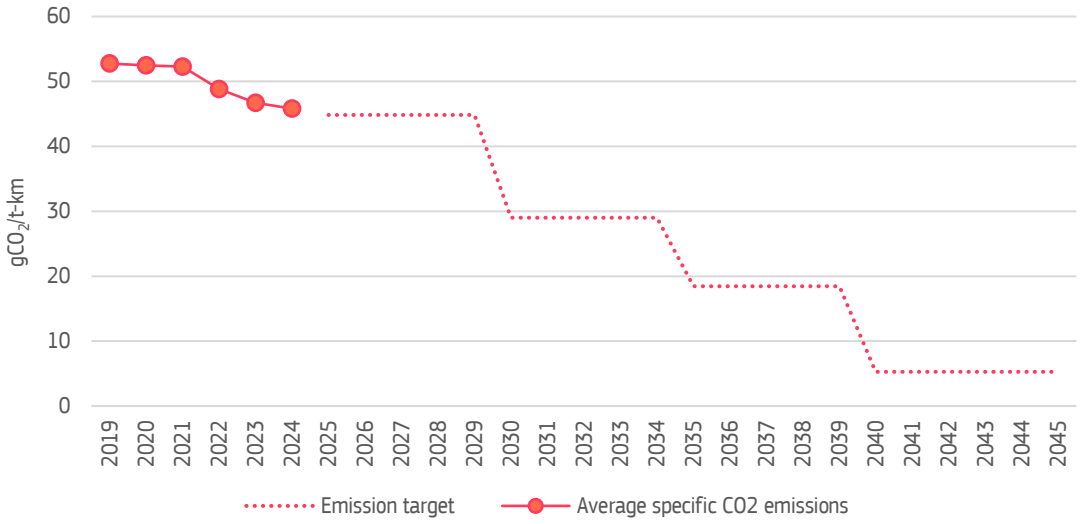
Note: The targets applicable until 2024 are the WLTP (Worldwide Harmonised Light Vehicles Test Procedure) equivalents of the NEDC (New European Driving Cycle) targets set out in the legislation (e.g., 95 gCO_2/km for cars and 147 gCO_2/km for vans for the period 2020-2024). The targets applicable from 2025 represent a % of reduction in CO_2 emissions compared to the 2021 baseline: -15% for 2025-2029, -55% for cars and -50% for vans for 2030-2034, and -100% from 2035 onward.

Source: EEA.

In December 2025, the European Commission presented the Automotive Package to support the automotive sector's efforts in the transition to clean mobility. It sets an ambitious yet pragmatic policy framework to ensure 2050 climate neutrality. It does so by maintaining a strong market signal for the deployment of zero-emission vehicles, while giving the sector more flexibility to achieve its CO_2 targets.

The package contains several policy measures and includes a proposal for the revision of the light-duty vehicles' CO_2 standards, which is currently under discussion. According to this proposal, from 2035 onwards, carmakers would need to comply with a 90% tailpipe emission reduction target. They would also need to compensate for the remaining 10% emissions through the use of low-carbon steel *Made in the Union*, or from e-fuels and biofuels. At the same time, from 2030, van manufacturers would have to comply with a reduced target of 40% (instead of 50%).

Figure 31: Average specific CO_2 emissions of new heavy lorries and CO_2 emissions targets for heavy lorries and, from 2030, several vehicle groups falling under the extended scope



Note: Targets indicate mandatory average CO_2 emission reductions for new heavy-duty vehicles relative to the 2019 baseline: -15% in 2025, -45% in 2030, -65% in 2035, and -90% from 2040 onward (city buses require 100% zero-emissions by 2035).

Source: EEA.

Estimated mitigation impact

The Regulation enables greenhouse gas emission reductions by ensuring standards and target levels to ensure the rollout and availability zero- and low-emission vehicles.
The impact assessment does not provide a stand-alone estimate of emission reductions from the Regulation. The uptake of cleaner vehicles is driven not only by CO_2 emission standards, put also by the deployment of suitable and

sufficient charging and refuelling infrastructure. The resulting emission reductions therefore cannot be attributed to the Regulation alone.

Infrastructure for alternative fuels

Key mitigation policy

The Alternative Fuels Infrastructure Regulation, adopted in 2023, supports the transition to cleaner transport by ensuring that sufficient charging and refuelling infrastructure is available across the EU. It sets binding targets for EU Member States to deploy public charging points for EVs and hydrogen refuelling stations, with a particular focus on the main European transport network.

The Regulation also supports cleaner maritime and air transport. It requires shore-side electricity in major ports and electricity supply for stationary aircraft at major airports. It also introduces common requirements for payment, user information and the technical compatibility of charging and refuelling infrastructure.

Estimated mitigation impact

The Regulation enables greenhouse gas emission reductions by ensuring that sufficient charging and refuelling infrastructure is available for zero- and low-emission vehicles and vessels.
The impact assessment does not provide a stand-alone estimate of emission reductions from the Regulation. The uptake of cleaner vehicles is driven mainly by other policies, such as CO_2 emission standards, while suitable infrastructure makes this transition possible. The resulting emission reductions therefore cannot be attributed to the Regulation alone.

Sustainable aviation fuels

Key mitigation policy

The ReFuelEU Aviation Regulation, which entered into force in November 2023, aims to increase the use of sustainable aviation fuels in the EU. Fuel suppliers at EU airports covered by the Regulation must gradually increase the share of sustainable aviation fuels they supply, from 2% in 2025 to 70% in 2050. Within this target, a minimum share of synthetic aviation fuels will also apply, rising from 1.2% in 2030 to 35% in 2050.

Airports must ensure that the necessary infrastructure is available for supplying and refuelling sustainable aviation fuels. Aircraft operators must also refuel at least 90% of

the fuel needed for each flight at the departure airport. This limits unnecessary extra fuel carried to avoid refuelling elsewhere, which increases fuel use and emissions.

The Regulation's success will depend largely on increasing the production of sustainable aviation fuels. These fuels play an important role in aviation decarbonisation, especially for long-haul flights where alternatives to liquid fuels remain limited. However, they are still more expensive than conventional aviation fuel, mainly because of high production costs, feedstock prices and demand for renewable electricity. Innovation could enable the production of sustainable aviation fuels from EU sources, helping to meet demand under ReFuelEU Aviation. Supporting the entire value chain, from feedstock supply to industrial production, could strengthen supply security, competitiveness and economic resilience.
Electrification also offers opportunities for aviation decarbonisation where technically feasible. Despite higher upfront investment, electric aircraft could have significantly lower operating costs. Supporting both domestic fuel production and research into electric aircraft can therefore contribute to a more resilient and competitive European aviation sector.

Estimated mitigation impact

According to the impact assessment, the ReFuelEU Aviation Regulation could reduce life-cycle greenhouse gas emissions from aviation by up to 6.8% by 2030 and by at least 65% by 2050 compared with the baseline. The main driver is the increasing use of sustainable aviation fuels, including synthetic fuels. Further reductions are expected from carbon pricing and from measures that limit the carrying of unnecessary extra fuel. The overall impact will depend on how quickly sustainable aviation fuels become available and affordable.

Renewable fuels in maritime transport

Key mitigation policy

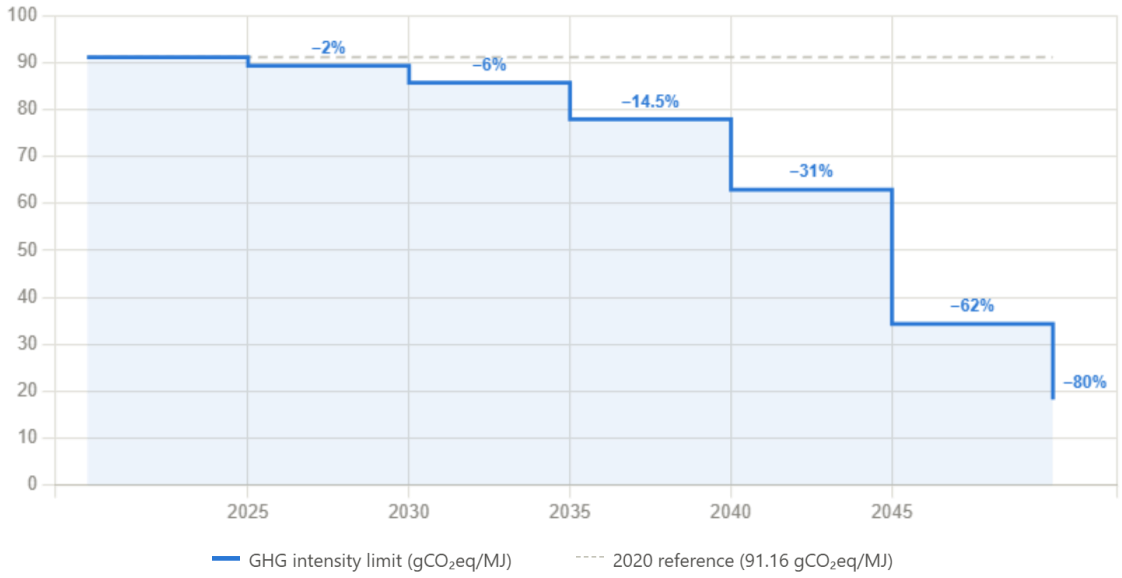
The FuelEU maritime regulation, which entered into force in 2025, promotes the use of renewable, low-carbon fuels and clean energy technologies for ships, which are essential to support decarbonisation in maritime transport.

The Regulation requires large ships calling at EU ports to gradually reduce the greenhouse gas intensity of the energy they use. The required reduction starts at 2% in 2025 and increases to 80% by 2050 compared with the 2020 reference level (see Figure 32). The rules cover emissions over the full life cycle of the fuels, including CO_2, methane and nitrous oxide. The Regulation is technology-neutral, allowing ship operators to choose how to meet the targets, for example through renewable and low-carbon fuels or other cleaner energy solutions.

Compliance is checked annually for each ship and verified by independent accredited verifiers. Ships can also be grouped together for compliance purposes, including across different companies. This allows ships that perform better than required to compensate for those that do not meet the target.

From 2030, passenger and container ships must also use shore-side electricity or another zero-emission technology while at berth in EU ports covered by the Regulation.

Figure 32: GHG-intensity reduction target for maritime transport



Source: Article 4 of Regulation (EU) 2023/1805.

Estimated mitigation impact

According to the impact assessment accompanying FuelEU maritime, the Regulation is expected to deliver substantial life-cycle greenhouse gas emission reductions by increasing the uptake of renewable and low-carbon fuels in the maritime transport sector. The progressively tightening greenhouse gas intensity requirements are expected to reduce emissions by approximately 80 $MtCO_2$-eq cumulatively by 2050 compared with the baseline scenario, and to contribute significantly to the decarbonisation of maritime transport. In addition, the extension of the EU ETS to maritime transport provides a carbon-price signal that incentivises fuel switching, operational efficiency improvements and investment in low-emission technologies.

The realised emission reductions will depend on the availability and deployment of renewable and low-carbon fuels, supporting infrastructure and technological innovation across the sector.

3.5.6 Industry and product use

Industry is a major source of EU greenhouse gas emissions, particularly in energy-intensive sectors such as steel, cement and chemicals. Reducing these emissions requires greater energy and material efficiency, electrification, renewable and low-carbon energy, and the deployment of technologies such as renewable hydrogen and carbon capture and storage.

The Fit for 55 package strengthened the policy framework for industrial decarbonisation. In 2025, the Clean Industrial Deal further linked decarbonisation to industrial competitiveness. It aims to support energy-intensive industries in switching to cleaner production, while strengthening the EU manufacturing base for clean technologies.

Industry is covered by the cross-cutting policies shown in Table 12. The main sector-specific policies are described in the following section.

Recent policy developments

Supporting European industry

The EU also provides support to industry in this transition. In March 2026, the Commission proposed the '**Industrial Accelerator Act'** to boost demand for low-carbon, EU-made technologies and industrial products in strategic sectors such as steel or cement. It sets low-carbon and 'Made in EU' requirements in public procurement and public support schemes, streamlines permitting industrial projects, and sets conditions for major foreign investments to stimulate job creation and innovation. Member States and the European Parliament are currently discussing the proposal.

Table 12: Cross-cutting policies in industry

Policy	Effect on sector
Emissions Trading System 1	Direct effect
Emissions Trading System 2	Direct effect
Effort Sharing Regulation	Direct effect
Carbon Border Adjustment Mechanism	Direct effect
Net-Zero Industry Act	Direct effect
Industrial Emissions Directive	Direct effect
Carbon Capture and Storage Directive	Direct effect
Carbon removals and carbon farming	Direct effect
EU taxonomy for sustainable activities	Indirect effect
The Energy Taxation Directive	Direct effect
Corporate Sustainability Reporting Directive	Indirect effect

Fluorinated gases



Key mitigation policy

The EU has regulated fluorinated greenhouse gases (F-gases) since the 2006. The first F-gas Regulation set requirements for the containment, recovery, reporting and control of fluorinated gases used in refrigeration, air conditioning, foam, aerosol and electrical equipment applications. The Regulation was further strengthened in 2014 and introduced a progressively tighter EU-wide HFC quota system ('phase-down'), placing restrictions on the quantity of HFCs that could be placed on the market while also expanding prohibitions on specific products and equipment containing high-global-warming-potential (GWP) gases. The Regulation contributed to a significant reduction in F-gas emissions and supported the implementation of the Kigali Amendment to the Montreal Protocol.

The most recent changes were introduced with the new F-gas regulation in 2024, which sets a more ambitious trajectory towards eliminating the use of high-GWP fluorinated gases wherever technically and economically feasible. The Regulation introduces stricter controls on the production, import, export, placing on the market and use of fluorinated greenhouse gases, while reinforcing monitoring, reporting, certification and enforcement provisions across EU Member States.

A central element of the Regulation is the accelerated phase-down and eventual phase-out of hydrofluorocarbons (HFCs). The Regulation further reduces the quantity of HFCs that may be placed on the EU market through a declining quota system and sets out a pathway towards a near-complete phase-out of HFC consumption by 2050. In parallel,

the Regulation introduces additional placing-on-the-market prohibitions for refrigeration, air conditioning, heat pump, foam and aerosol products using fluorinated gases with high GWP. These measures are designed to stimulate the uptake of low-GWP alternatives, including natural refrigerants and other climate-friendly technologies, thereby delivering substantial reductions in greenhouse gas emissions from sectors that have historically been major sources of F-gas emissions.

The Regulation is expected to significantly reduce fluorinated greenhouse gas emissions in the EU. The main reductions will come from the phase-down of HFCs, wider use of lower-emission alternatives, and stricter measures to prevent leaks and recover gases during servicing and disposal. The Regulation also introduces product bans, certification requirements and stronger controls to prevent the illegal trade of HFCs and products and equipment containing fluorinated greenhouse gases.

These measures mainly affect refrigeration, air conditioning, heat pumps, foams, aerosols and electrical equipment.

Estimate of mitigation impact

According to the impact assessment for the Regulation, the strengthened F-gas framework is expected to generate cumulative additional savings of approximately 40 $MtCO_2$-eq between 2024 and 2030 which will complement the efforts taken in EU Member States to reach their targets under the ESR in a cost-effective way. These savings will come on top of the 430 $MtCO_2$-eq estimated to result from the current Regulation.

3.5.7 Agriculture

The key EU policies and measures to reduce emissions from agriculture target CO_2, CH_4 and N_2O: the three greenhouse gases related to livestock, manure management and soil fertilisation. Some cross-cutting policies and measures also affect CO_2 emissions and removals in the land use, land-use change and forestry (LULUCF) sector, i.e. related to carbon sequestration in biomass and soils due to land management.

The Farm to Fork Strategy sets the main objectives for making the EU food system more sustainable and guides related regulatory and economic measures, including support through the common agricultural policy. Its main climate-related objectives include reducing agricultural emissions, cutting nutrient losses by at least 50% and fertiliser use by at least 20% by 2030, and expanding organic farming. The 2025 Vision for Agriculture and Food builds on those objectives and places greater emphasis on competitiveness and resilience, while confirming that agriculture must contribute to the EU's 2030 and 2040 climate targets.

Agriculture is also covered by the cross-cutting policies shown in Table 13. The main sector-specific policies are described in the following section.

Table 13: Cross-cutting policies in agriculture

Policy	Effect on sector
Effort Sharing Regulation	Direct effect
Industrial Emissions Directive	Direct effect
LULUCF Regulation	Direct effect
Carbon removals and carbon farming	Direct effect
EU taxonomy for sustainable activities	Indirect effect
The Energy Taxation Directive	Direct effect
Corporate Sustainability Reporting Directive	Indirect effect

Nitrates Directive

The Nitrates Directive aims to improve water quality by reducing nitrate losses from agriculture. Although it is mainly a water-quality measure, it can also help reduce greenhouse gas emissions by improving nitrogen management and lowering nitrous oxide (N_2O) emissions from agricultural soils.

The 2026 evaluation of the Directive confirmed these climate benefits. It found that better use of fertilisers and improved manure management can reduce nitrogen losses and related N_2O emissions. More efficient use of nitrogen fertilisers can also reduce emissions linked to their production.

Estimated mitigation impact

The evaluation concluded that the Nitrates Directive has successfully reduced nitrogen losses in agriculture by improving nutrient-use efficiency and manure management, with associated benefits in atmospheric nitrogen emissions. Nevertheless, persistent regional concentrations of livestock and manure mean that further reductions will depend on stronger and more locally targeted implementation rather than the existing manure limit alone.

3.5.8 Land-use sector

The LULUCF sector has become increasingly important for EU-wide climate policy in recent years. It absorbs more greenhouse gases than it emits, removing significant volumes of CO_2 from the atmosphere, and therefore plays a major role in achieving the EU's climate policy goals. It also helps increase removals and boost the resilience of the agriculture and forestry sectors. As a key pillar for the EU's bioeconomy, the sector is equally important for the transition to a climate-neutral and resilient economy, for instance by providing food and materials that replace fossil fuels or carbon-intensive materials.

Net removals in the LULUCF sector increased by approximately 15 Mt in 2024 compared with 2023, resulting in a total net sink of −231 $MtCO_2$-eq in 2024.

Despite this improvement, however, the carbon removal sink has been declining at a worrying speed over the last decade. This trend is mainly driven by increased harvesting and slower forest growth. This, in turn, is due to the growing impacts of climate change. More frequent and severe forest fires, wind damage, droughts, and insect and fungus outbreaks are reducing forests' ability to absorb carbon. In some cases, ageing forests are also a factor. The future capacity of EU forests to remove carbon is therefore uncertain, and the EU may be at risk of losing its ability to offset carbon emissions from other sources. At present, land used for settlements, cropland, wetlands and grassland are the main sources of LULUCF emissions.

The EU Forest Strategy for 2030 supports the protection, restoration and sustainable management of forests and aims to strengthen their resilience to climate change. It also includes a commitment to plant at least 3 billion additional trees in the EU by 2030. The EU Biodiversity Strategy for 2030 complements these efforts by strengthening the protection and restoration of ecosystems, including forests.

Land use is covered by the cross-cutting policies shown in Table 14. The main sector-specific policies are described in the following section.

Table 14: Cross-cutting policies in the land-use sector

Policy	Effect on sector
LULUCF regulation	Direct effect
Carbon removals and carbon farming	Direct effect
EU taxonomy for sustainable activities	Indirect effect
Corporate Sustainability Reporting Directive	Indirect effect

Land monitoring

The revised LULUCF framework requires EU Member States to set up systems to monitor soil and biomass carbon stocks. The Soil Monitoring Law, adopted in 2025, further strengthens soil monitoring across the EU, including monitoring of soil organic carbon. Better and more timely information on land, soils and forests can help identify where mitigation measures are most effective and support better investment decisions. The European Commission supports these efforts through financial programmes and tools such as Horizon Europe and Copernicus.

Estimated mitigation impact

The Soil Monitoring Law does not set a direct greenhouse gas mitigation target. However, healthy soils play an important role in maintaining and improving soil organic carbon stocks and supporting long-term carbon sequestration. The framework therefore contributes indirectly to the achievement of EU climate objectives through improved soil management, restoration and protection.

Nature Restoration Regulation

The Nature Restoration Regulation, adopted in 2024, sets the legally binding requirements to restore degraded terrestrial, freshwater, costal and marine ecosystems. It has been effective since 2024, with national implementation plans due in 2026 and quantified restoration targets for 2030, 2040 and 2050.

The Regulation aims to put in place effective restoration measures covering at least 20% of the EU's land and sea areas by 2030 and all ecosystems in need of restoration by 2050. It explicitly contributes to climate change mitigation and adaptation, land degradation neutrality and food security. The Regulation includes targets for a wide range of ecosystems, including agricultural and forest ecosystems. It also requires EU Member States to prepare national restoration plans identifying areas to be restored, and synergies with climate mitigation, adaptation, disaster prevention, agriculture and forestry.

Estimated mitigation impact

The impact assessment for the Nature Restoration Regulation does not provide aggregated *ex ante* greenhouse gas emission reduction estimates. However, it quantifies a potential emission reduction of about 50 $MtCO_2$-eq per year from restoring/rewetting drained peatlands once restoration measures are fully implemented. Additionally, the Regulation is expected to generate significant adaptation, environmental and socio-economic co-benefits and can contribute significantly to policies that promote carbon removals, including LULUCF.

Deforestation-free supply chains

The regulation on deforestation-free products is another relevant measure for the LULUCF-related policy landscape. It aims to address deforestation and forest degradation associated with EU consumption of commodities such as cattle, wood, cocoa, soy, palm oil, coffee and rubber. Operators and traders placing these commodities on the EU market, or exporting them, must demonstrate that the products do not originate from recently deforested land and have not contributed to forest degradation.

Estimated mitigation impact

According to the impact assessment, the Regulation is expected to reduce global carbon emissions by at least 32 million tonnes per year from 2030 by reducing deforestation and forest degradation linked to EU consumption and production of the relevant commodities.

3.5.9 Waste sector and circular economy

EU waste policy dates back to 1975, when the first EU waste legislation was adopted. Since then, it has gradually expanded to cover different waste sources and waste streams. Its main focus is waste management, while waste prevention and reduction have become increasingly important. Although it does not specifically address climate action, many waste policies also reduce greenhouse gas emissions directly or indirectly.

Waste and circular economy policies have impacts across several sectors, not only the waste sector. For example, recycling and reuse can reduce demand for virgin materials and lower emissions from industry and energy use. Some benefits may also occur in other countries, depending on where materials are produced and processed. Because these effects are spread across sectors and value chains, it is difficult to estimate the greenhouse gas impact of individual policies. Their overall mitigation benefits are therefore often only partly captured in standard emissions reporting.

In 2021, the European Commission adopted the zero-pollution action plan as part of the European Green Deal. It provides the overall policy framework for reducing air, water and soil pollution and is closely linked to waste policy. It sets specific targets for 2030 for cutting residual municipal waste by half and significantly reducing total waste generation in the EU.

The circular economy action plan, adopted in 2020, is another part of the European Green Deal. It sets out 35 actions targeting the whole life cycle of products. Progress is tracked through the circular economy monitoring framework, which was revised in 2023.

In 2024, the waste sector accounted for 3.7% of total greenhouse gas emissions. Emissions from the sector are expected to keep falling, mainly thanks to the EU waste legislation described in this section. That legislation has been further strengthened since the EU's first biennial transparency report.

The cross-cutting policies shown in Table 15 also cover the waste sector.

Table 15: Cross-cutting policies in the waste sector

Policy	Effect on sector
Effort Sharing Regulation	Direct effect
EU taxonomy for sustainable activities	Indirect effect
The Energy Taxation Directive	Direct effect

Waste and recycling

The Waste Framework Directive is the main EU law on waste management. It sets the waste hierarchy, which gives priority to preventing waste, followed by preparing it for reuse, recycling, other recovery and, as a last option, disposal. The Directive sets three main targets:

- by 2020, the amount of waste materials such as paper, metal, plastic and glass from households to be prepared for reuse and recycling was to be increased to a minimum of 50% by weight;
- the amount of municipal waste to be prepared for reuse and recycling is to be increased to a minimum of 55% by 2025, 60% by 2030 and 65% by 2035;
- by 2020, the amount of non-hazardous construction and demolition waste, including backfilling, to be prepared for reuse, recycling and other material recovery was to be increased to a minimum of 70% by weight.

In 2025, the Directive was revised to strengthen the prevention and management of textile and food waste. The revision introduces mandatory extended producer responsibility schemes for textiles and footwear, sets binding food waste reduction targets for 2030, strengthens requirements for the management of used textiles and textile waste, and boosts measures to prevent food waste, including through food donation.

Estimated mitigation impact

According to the impact assessment for the revised Waste Framework Directive, measures to reduce food waste could cut greenhouse gas emissions by an additional 62 $MtCO_2$-eq across the whole food supply chain in 2030.
Waste prevention, reuse and recycling can also reduce emissions by lowering the use of resources and reducing methane emissions from landfills.

Sustainable products

The Ecodesign for Sustainable Products Regulation is a key part of the EU's approach to making products more sustainable and circular. It allows the EU to set requirements – including on durability, repairability, recycled content, recyclability and environmental footprint – for products placed on the EU market. It also introduces digital product passports and measures to prevent the destruction of unsold consumer products.

Estimated mitigation impact

According to the impact assessment accompanying the Regulation, product-specific ecodesign requirements could reduce global greenhouse gas emissions by around 117-471 $MtCO_2$-eq per year. These reductions would come from more durable and repairable products, more efficient use of materials, and increased reuse and recycling. The estimates cover life-cycle emissions across global value chains and therefore do not represent direct reductions in the EU greenhouse gas inventory. The actual impact will depend on the scope and ambition of future product-specific ecodesign requirements.

Wastewater

The revised Urban Wastewater Treatment Directive entered into force in 2025. It aims to ensure that wastewater is collected, treated and discharged effectively.

The revised Directive extends the rules to smaller municipalities and introduces new requirements for treating wastewater. It also aims to reduce energy use and greenhouse gas emissions. In particular, it sets an energy neutrality target for waste water treatment plants of 10 000 population equivalent and above. At national level, these plants must produce as much renewable energy as they consume by 2045, with intermediate targets applying from 2030.

Estimated mitigation impact

The revised Urban Wastewater Treatment Directive contributes to greenhouse gas mitigation through better wastewater collection and treatment, reductions in methane (CH_4) and nitrous oxide (N_2O) emissions, and increased energy efficiency in the wastewater sector. According to the impact assessment accompanying the revision, measures implemented to achieve energy neutrality are expected to reduce greenhouse gas emissions by approximately 3.4 $MtCO_2$-eq annually by 2045. Additional mitigation benefits are expected from better wastewater treatment, resource recovery and circular economy measures, including water reuse, nutrient recovery and the treatment of micropollutants.

Landfilling

The EU's waste hierarchy establishes landfilling as the least preferable option for waste disposal. It should be kept to an absolute minimum. The Landfill Directive sets stringent operational and technical requirements for landfill sites with the goal of minimising any negative effects on human health and the environment (including methane emissions). Key measures of the Directive are:

- introducing restrictions on the landfilling of all waste that is suitable for recycling or other material or energy recovery from 2030;

- limiting the share of municipal waste landfilled to 10% by 2035 (by weight).

In 2024, 22% of municipal waste was landfilled in the EU. This has fallen considerably over time, from around 56% in 1999, when the original directive was adopted, and 26% in 2018, when the 2035 target was introduced.

Estimated mitigation impact

The Landfill Directive reduces greenhouse gas emissions mainly by cutting methane (CH_4) emissions from landfills. Methane is produced when biodegradable waste decomposes in landfill sites. By limiting the landfilling of biodegradable and municipal waste, the Directive has contributed to the long-term decline in waste sector emissions in the EU.
However, emission reductions in the waste sector result from several intertwined factors and policies. It is therefore difficult to isolate and quantify the impact of the Landfill Directive alone.

Policies targeting specific waste streams

In addition to the general waste framework, the EU has specific rules for several important waste streams. These policies set requirements for collection, recycling, recovery, recycled content or product design. Their aim is to reduce waste, keep materials in use for longer and improve the recovery of valuable materials.

Examples include EU rules on:

- packaging and packaging waste;
- single-use plastics and plastic bags;
- batteries and waste batteries;
- vehicles and end-of-life vehicles;
- waste electrical and electronic equipment;
- end-of-life fishing gear.

Together, these measures support the transition to a more circular economy and can also reduce greenhouse gas emissions by lowering demand for primary raw materials and reducing waste disposal.

Estimated mitigation impact

Policies targeting specific waste streams can reduce greenhouse gas emissions in several ways. Better collection, recycling and reuse can reduce waste disposal and lower demand for primary raw materials. Product design and recycled content requirements can also reduce energy and material use. These reductions may

occur in waste management, industry, energy production or other parts of the value chain, including outside the EU.
The overall impact is difficult to quantify because the benefits are spread across different sectors and value chains. Where estimates are available, they can nevertheless be significant. For example, the impact assessment for rules on vehicle design and end-of-life vehicles estimated annual greenhouse gas emission reductions of around 11 $MtCO_2$-eq by 2030, rising to 14 $MtCO_2$-eq by 2040.

3.5.10 Gender mainstreaming

The Communication on managing climate risks highlights that climate risks affect some people more than others, especially those in vulnerable situations due to different socio-economic factors such as income, gender, age, disability, health and social exclusion. This reflects growing recognition that climate risks can affect women and men differently and the need to include gender considerations in climate policies.

The EU framework is anchored by the EU Gender Equality Strategy 2020-2025, which is succeeded by the Gender Equality Strategy 2026–2030, adopted in March 2026. It continues the dual approach of gender mainstreaming combined with targeted action, with intersectionality as a horizontal principle for its implementation, and suggests actions to integrate gender equality into every aspect of life. It is aligned with the Roadmap for Women's Rights and introduces technical guidance on tracking expenditures contributing to gender equality under the next Multiannual Financial Framework.

How gender mainstreaming affects the climate component of EU policy

Gender mainstreaming, in particular, is one key aspect of making EU budget and policymaking more inclusive by integrating a gender perspective into the preparation, design, implementation, monitoring and evaluation of policies, regulatory measures and spending programmes while addressing the issue of the representation of women in each policy area. This can be done using different tools and methods from gender analysis to gender audit to indicators and sex-disaggregated data. Gender mainstreaming is now an integral part and parcel of major EU policies and funding programmes, which then become vehicles for the implementation of gender equality principles. Some of these include the European Social Fund Plus, the European Regional Development Fund, the Just Transition Fund, Horizon Europe, and the Neighbourhood, Development and International Cooperation Instrument – Global Europe[23]. This gender-based approach across both policies and funding has an impact on climate policy and on all policies including a climate component, which must also include a gender dimension.

[23] Gender equality mainstreaming - European Commission.

WomenInClimate

WomenInClimate is an example of a transnational project funded by the **EU Citizens, Equality, Rights and Values** programme that aims to mainstream gender in EU climate policies by further connecting civil society and policymakers to promote inclusive climate solutions, using a bottom-up approach, starting from local knowledge and activism and moving toward EU-level advocacy.

Gender equality is also at the core of President von der Leyen's commitment to ensuring gender balance at all levels of management in the European Commission, with considerable progress made over the past few years (see Table 16).

Table 16: Female representation increased since 2019 (data on 1 January 2026)

Indicator	2019	2026
Middle management	42%	50.2%
Senior management	37%	46.9%
Overall representation		49.5%

Source: The European Commission diversity and inclusion

This, in turn, translates into higher gender balanced representation in policymaking, with a horizontal impact also on climate aspects across all EU policies, especially considering the European Green Deal objective of including a climate dimension in all policy areas.

Funding instruments

In the 2021-2027 period, over 30% of all cohesion policy investments will support gender equality[24]. The **European Regional Development Fund 2021–2027**, for example, has earmarked EUR 19.9 billion for gender-targeted action and mainstreaming measures playing an important role in advancing gender equality[25]. An example of such measures applied to climate and environmental policy includes actions to embed a gender lens in sustainable urban development and renewable energy transitions.

In parallel, **NextGenerationEU 2021-2027**, in particular the **Recovery and Resilience Facility (RRF)**, aimed at mitigating the social and economic impact of the COVID-19 crisis, have also supported a wide range of measures contributing to gender equality. Regulation (EU) 2021/241 establishing the Recovery and Resilience Facility specifically calls for the RRF to improve the social and economic situation, with a particular focus on social and economic effects of the crises on women.

[24] Cohesion policy: supporting gender equality | Cohesion Open Data.

[25] Gender equality mainstreaming - European Commission

The **mid-term evaluation of the RRF**[26] highlights that in the 2021-2023 period, of the 256 milestones and targets with a focus on gender equality across the EU-27 Member States' recovery and resilience plans (RRPs), 83 are already reported as completed or have been assessed as fulfilled, representing a 32% progress rate (approximately 13% have been positively assessed).

Under the **European Green Deal,** the **Just Transition Mechanism** and **Fund** ensure that the EU's shift to climate neutrality is fair for everyone. The Just Transition Fund (JTF) includes a gender dimension in the climate-neutrality transition through mainstreaming and direct measures including promoting women's participation in upskilling, entrepreneurship and workplace representation, addressing energy poverty and energy efficiency in housing or supporting start-ups led by women. In 2025, gender equality accounted for 23.6% of the total allocation, while, based on the adopted programmes, for the whole 2021-2027 period, about 25% of the planned amounts will be used to focus on gender equality.

Women in Technics

In the Netherlands, the JTF supported women in technology through the **Women in Technics** project to retraining and upskilling of technical staff in occupations relevant to the energy and industrial transition, specifically targeting women by addressing their untapped potential.

Along similar lines, the **Social Climate Fund,** by supporting vulnerable people and businesses who are most affected by rising energy and transport costs across Europe[27], can also be relevant from a gender perspective, particularly given the links between gender and energy poverty, with women and households headed by women being more likely to be disproportionately affected by energy poverty or experience it differently.

European Institute for Gender Equality

The **European Institute for Gender Equality (EIGE)** plays a central supporting role in this area. EIGE is the EU agency established to contribute to and strengthen the promotion of gender equality, including gender mainstreaming in all EU policies. It supports implementation by producing comparable data, indicators, research, methodological guidance, toolkits and statistical resources for EU institutions and Member States.

In October 2024, EIGE published a report with **12 good practices in terms of mainstreaming gender in the European Green Deal,** covering rural and urban areas, public and private stakeholders and various sectors and industries, often dominated by

[26] Mid-term evaluation of the Recovery and Resilience Facility (RRF) - European Commission

[27] Social Climate Fund - Employment, Social Affairs and Inclusion

men[28]. Most practices identified include gender analyses and awareness raising, gender competence development, sex-disaggregated data and gender indicators, and equal participation of women and men in employment. Several of them showcase how gender mainstreaming can be effectively implemented in the European Green Deal policy areas of climate, the environment and oceans, energy, transport, agriculture, finance, regional development, industry and research and innovation. EIGE's good practices show that gender-responsive implementation of the European Green Deal combines women's participation and representation with gender-sensitive policy design, data, funding, skills development and institutional capacity, so that the green transition addresses existing inequalities rather than reproducing them.

GREENA

As part of the **Gender-responsive evaluation for an environmental and sustainable future for all (GREENA[29])** project – an EU-funded project that addresses the links between gender and climate – EIGE has developed a step-by-step toolkit to support gender-responsive evaluation across climate-related fields including energy, agriculture and the circular economy.

Across EU policy and funding instruments, sex-disaggregated data are used where relevant to monitor participation, outputs, outcomes and distributional effects on women and men. This forms part of gender mainstreaming and evidence-based policymaking. For example, EIGE provides disaggregated data highlighting that women are still under-represented in climate change decision-making bodies at national level in EU Member States. The data show an upward trend until 2023, followed by a decline, reaching 25.3% in 2025[30].

The EU's gender equality framework increasingly combines gender mainstreaming, targeted measures and gender-responsive funding to tackle persistent inequalities while integrating gender considerations into cross-cutting areas including climate and energy. Looking ahead to the 2028-2034 Multiannual Financial Framework, monitoring also improves through stricter requirements for gender-disaggregated data in programme reporting, with Article 44 of the Financial Regulation and the 2025 proposal for a Performance Regulation requiring disaggregation where feasible, thereby strengthening accountability and making for more intersectional assessment of outcomes[31].

[28] Good practices on gender mainstreaming in the European Green Deal: Towards a more gender-equal and greener Europe | European Institute for Gender Equality

[29] Gender-responsive Evaluation for a Sustainable Future for All: GREENA step-by-step toolkit | European Institute for Gender Equality

[30] Indicator: National ministries dealing with environment and climate change: ministers by seniority | Gender Statistics Database | European Institute for Gender Equality.

[31] Gender equality mainstreaming - European Commission.

3.5.11 Methodologies and assumptions

General approach to estimating mitigation impacts

The EU uses different methods to estimate the greenhouse gas emission reductions and removals that result from its policies. The method depends on the type of policy, the sector concerned and the available data.

Before drafting the legislative proposal, the responsible Directorate-General publishes a call for evidence , consult stakeholder and prepare an impact assessment. The impact assessment for legislative proposal lies in the EU Better Regulation framework which requires *ex-ante* evaluation of foreseeable economic, social and environmental effects simultaneously.

Estimates are mainly based on European Commission impact assessments, evaluations, modelling studies and sectoral analyses. They usually compare a baseline scenario, which reflects expected developments without the new policy, with a scenario in which the policy or package of policies is implemented. The difference between the two provides an estimate of the mitigation impact.

The Commission uses a range of models and analytical tools. Energy and economy-wide policies are often assessed using the price-induced market equilibrium system (PRIMES) modelling framework, while transport, agriculture and land-use policies use dedicated sectoral models and tools. Waste and circular economy policies may also use material flow and life-cycle analysis. In some cases, several models are combined to ensure consistency across sectors.

The estimates depend on assumptions about future economic growth, energy and commodity prices, technology uptake, behaviour and policy implementation. For agriculture and land use, assumptions on farming practices, forest growth, land-use change and climate conditions can also be relevant.

There is therefore no single methodology for all EU policies. Estimates are subject to uncertainty and should be understood as indicative based on the information and assumptions available when the analysis was carried out. More detailed information is provided in the impact assessments, evaluations and technical studies referenced for individual policies.

Data sources supporting mitigation impact assessments

Mitigation estimates draw on a wide range of EU and national data. Important sources include greenhouse gas inventories, Eurostat energy and economic statistics, sectoral activity data and monitoring systems established under EU legislation.

Additional sector-specific data are used where needed. These include agricultural and livestock statistics, forest inventories and land-use data, Copernicus Earth observation data, waste statistics, vehicle and transport data, and information on industrial production and material flows.

The European Environment Agency, Eurostat, the Joint Research Centre, Copernicus, Member States and other sector-specific reporting systems provide many of these datasets. They are used to establish baseline conditions, calibrate and validate models, and develop future scenarios. The exact data sources and assumptions used for each policy are described in the supporting impact assessments and technical documentation.

3.5.12 Other information

Policies and measures no longer in place

Compared with the Biennial Transparency Reports (BTR)1 reporting cycle, the greenhouse gas intensity reduction requirement for road transport fuels under the Fuel Quality Directive, which required a 6% reduction in the greenhouse gas intensity of transport fuels by 2020 compared with 2010 levels, is no longer in force. It has been superseded by the revised Renewable Energy Directive, which has the equivalent greenhouse gas intensity and renewable fuel supply requirements. No other policy or measure has been repealed since the previous reporting cycle.

Policies and measures in international transport

The following policies and measures on greenhouse gas emissions from international transport are currently in place.

- The EU Emissions Trading System, which covers emissions from international aviation and international maritime transport: see Section 3.5.3.
- ReFuelEU Aviation, which aims to increase both the demand for and supply of sustainable aviation fuels: see Section 3.5.5.
- The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA): see Section 3.5.3.
- The FuelEU Maritime Regulation, which tackles the greenhouse gas intensity of energy used by vessels calling at European ports: see Section 3.5.5.

Impacts on longer-term trends

The policies and measures introduced in this chapter help reduce greenhouse gas emissions and remove greenhouse gases by means of carbon sinks. While some measures mainly produce results in the short term, others are effective in the medium to long term. For example, vehicle emission standards help reduce greenhouse gas emissions from new vehicles. As they only affect new vehicles entering the market, they become more effective over time as old vehicles are increasingly replaced by new vehicles that meet the new standard. Research programmes can also contribute to long-term rather than short-term climate change mitigation.

The EU has observed that greenhouse gas emissions have been trending downward over the past decade, as shown in Chapter 2 National inventory report. This trend can be attributed to policies such as the EU ETS and the Effort Sharing Regulation (ESR). Both set mandatory and decreasing emission limits over time and can be considered the key drivers behind emission reductions in the EU in recent years.

EU energy policies and measures act over different time horizons. Carbon pricing and binding efficiency and renewable targets set decreasing limits and rising obligations over time, keeping the energy sector's emissions on a downward trend, while building renovation and ecodesign measures become more effective as the stock of product replacement occur. These measures are designed to generate co-benefits, such as improvements in energy security, lower energy costs and new jobs, while ensuring a just transition towards climate neutrality, and are accompanied by targeted support for households affected by energy poverty through ETS 2 revenues and the Social Climate Fund.

Both the EU ETS and the effort sharing system have been extended to 2030, with more stringent emission limits. This way, they will contribute to reducing emissions further and keeping them on their downward trajectory. The results of greenhouse gas emission projections also suggest that emissions will continue to decrease in the EU in the years ahead (see Section 3.7).

EU policies and measures will continue to push emissions downward, especially given that new and more ambitious policies and measures have been recently adopted.

Assessment of economic and social impacts (response measures)

Policies and measures to mitigate climate change (also known as 'response measures') can have multiple effects on societies and economies, both within the EU and non-EU countries. For example, a shift from fossil to renewable electricity generation can improve air quality and create new jobs, but it also jeopardises existing jobs in sectors and countries that focus on the production of fossil fuels. The EU therefore designs its policies and measures to in a way that maximises co-benefits, supports a just transition and minimises adverse economic and social consequences. The principle was reinforced by the amendment of the European Climate Law, which sets the binding target of reducing net greenhouse gas emissions by 90% by 2040 compared to 1990 and requires the Commission to take into account, among other considerations, social fairness, competitiveness, energy security and affordability when preparing post-2030 legislative proposals

EU framework for fair transition towards climate neutrality: the Council Recommendation of 16 June 2022 on ensuring a fair transition towards climate neutrality invites Member States to adopt comprehensive and coherent policy packages on quality employment, job transitions, education, skills, fair tax-benefit and social protection services and access to essential services and housing. It also invites them to take into account the impact of their transition on third countries.

Implementation is monitored in the European Semester with the Employment and Social Protection Committees. The first full progress review, carried out in 2025 and endorsed by the Council in December 2025, found that Member States had reported more than 500 new measures since 2023, mainly on employment services, energy poverty and green skills. Progress nevertheless remains uneven, with gaps in monitoring, governance and stakeholder engagement, and in the analysis of social and

employment impacts. To strengthen the evidence base, the Commission launched the European Fair Transition Observatory in March 2026.

The recommendation is complemented by the Just Transition Fund, which supports the regions most affected by the phase-out of carbon-intensive activities, and by the Social Climate Fund, which is expected to mobilise at least 86.7 billion over 2026-2032 for vulnerable households, micro-enterprises and transport users. The start of emissions trading for buildings and road transport (ETS2) has been postponed to 2028.

The assessment of the environmental, economic and social consequences of policies and measures is a key component of the EU's policymaking process, as some workers and occupational groups are disproportionately exposed to climate-related risks, including through direct exposure to hazards and through socio-economic vulnerability. Low-income households and more vulnerable communities, particularly those in dense urban environments, may also face higher exposure and lower adaptive capacity. This would help ensure that workforce resilience and labour-market dimensions are visible in the adaptation narrative.

Impact assessments: the Commission carries out impact assessments for legislative initiatives expected to have significant environmental, economic or social impacts. Impact assessment reports set out the expected impacts, the stakeholders affected and the results of consultations and are published with the Commission's proposals. The 'better regulation' toolbox includes dedicated tools on, among others, the Sustainable Development Goals, territorial impacts and developing countries. Following a communication of 28 April 2026 a simpler, clearer and better enforced EU rulebook, the 'better regulation' guidelines and toolbox are being revised.

Policy coherence for development: under Article 208 of the Treaty of the Functioning of the European Union, the EU takes account of development cooperation objectives in policies that are likely to affect developing countries. This commitment to policy coherence for development (PCD), reaffirmed in the 2017 European Consensus on Development, applies across all policies covered by the 2030 agenda and aims to minimise contradictions and build synergies between different EU policies[32]. The 'better regulation' toolbox, used by the European Commission when preparing new initiatives, includes specific guidance on analysing the potential impact of EU policy initiatives on developing countries. The Commission coordinated PCD with the European External Action Service.

Other information on the Kyoto protocol

In accordance with Article 7.2 of the Kyoto Protocol, supplementary information for the second commitment period was reported in the 8th National Communication in Chapters 3.3, 3.4, 4.3, 4.4, 4.5, 6.5, 7, 8 and 9. An overview of this information can be found in Table 16 on page 158 of the EU 8th National Communication.

[32] Policy coherence for development, https://ec.europa.eu/international-partnerships/policy-coherence-development_en.

In addition to the information reported in the 8th National Communication, the following information is provided here.

- The national registry of the EU and its Member States is maintained as a single EU registry, operated by the European Commission, Directorate-General for Climate Action, BE-1049 Brussels, Belgium.

3.6 Summary of greenhouse gas emissions and removals

For a summary of greenhouse gas emissions and removals, see Chapter 2 of this BTR and Common Tabular Format (CTF) Table 6, which has been submitted electronically together with this BTR.

3.7 Projections

This chapter presents EU projections of greenhouse gas emissions in the two scenarios: 'with existing measures' (WEM) and 'with additional measures' (WAM). For both scenarios, emissions are disaggregated by sector and by type of greenhouse gas.

The EU data aggregate EU Member States' greenhouse gas emission projections reported under the Governance Regulation; the detailed methodology is documented in Section 3.7.4. Projections are presented for 2025, 2030, 2035, 2040, 2045, 2050 and 2055. Data are presented as CO_2 equivalent. Projections are provided for net domestic GHG emissions, which include land use, land-use change and forestry (LULUCF) net emissions and removals and exclude emissions from fuel used in international aviation and maritime transport (international bunkers) but include indirect CO_2 emissions. Projected emissions from international aviation and maritime transport are dealt with separately.

Under the Governance Regulation, EU Member States had to submit their emission projections in March 2025. With 2026 being a non-compulsory reporting year under the Governance Regulation, only Member States with substantial changes in their projections submitted updated reports. These were Belgium, Estonia, Germany, Ireland, Italy, Lithuania, Romania and Denmark.

3.7.1 Total greenhouse gas emission projections

The projection data to be reported in tabular format are available in CTF Tables 7 to 11. Total greenhouse gas (GHG) emission projections (two pages).

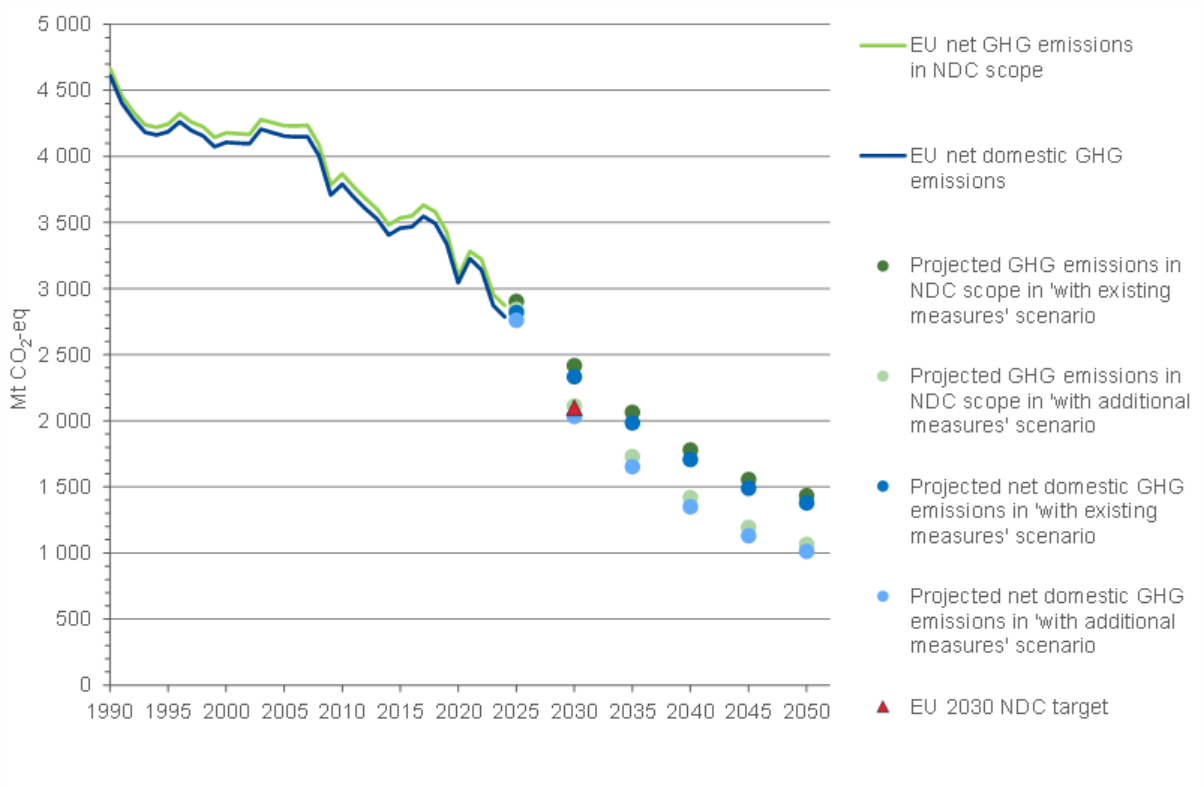
Figure 33 shows both historical and projected EU total GHG net emissions. Domestic-only net emissions and net emissions including international aviation and maritime emissions under the EU nationally determined contribution (NDC) scope are both shown (please see Annex I to this BTR for information on the EU NDC scope).

Total domestic greenhouse gas net emissions are projected to fall significantly, from 2 786 $MtCO_2$-eq in 2024 to 2 333 $MtCO_2$-eq in the WEM scenario, and 2 032 $MtCO_2$-eq in the WAM scenario by 2030. This translates into a reduction in net greenhouse gas

emissions of 49% by 2030, as compared to 1990 levels, or 56% when additional measures are taken into account ('with additional measures' (WAM) scenario in Figure 33). EU Member States are not required to provide projections for international aviation and maritime transport emissions under the EU NDC scope. Assuming such emissions are constantly proportionate to total international transport emissions (CRT category 1.D.1.a and 1.D.1.b), the reduction by 2030 is estimated to be 48% and 55% in the WEM and WAM scenarios respectively.

Like all emission projections, EU projections come with considerable uncertainties. Changes in energy prices or supply chain disruptions could considerably alter the economic context and consequently the GHG emissions in the years ahead.

Figure 33: Historic and projected net greenhouse gas emissions in the EU



Sources: Annual EU GHG inventory 1990-2024, EU Member States' GHG emission projections submitted in 2025 and 2026 under the Governance Regulation, NDC scope emissions as calculated in the Annex I to this BTR.

The projection results shown above demonstrate a marked improvement on the previous BTR in both WEM and WAM scenarios. In the WAM scenario, which includes existing and planned measures, net GHG emissions in the EU by 2030 are projected to be 11% lower than previously estimated – putting the EU on track to meet its NDC target of a 55% reduction.

3.7.2 Projections by sector

Absolute historical and projected greenhouse gas emissions by sector in the EU are represented in Figure 34. The upper part of the figure shows historical data and

projections from the WEM scenario and the lower part historical data and projections from the WAM scenario. Figure 35 provides insights into the current and projected share of GHG emissions by sector.

Figure 35 shows that the **energy sector** (excluding transport) remains the largest source of EU GHG emissions throughout the period, accounting for 49% of total domestic emissions in 2024 and 47% and 46% in 2030 WEM and WAM scenarios respectively. Energy emissions are projected to fall by 61% in 2030 compared to 1990, taking into account existing measures, and by 66% with additional measures. Short and steep decreases occurred during the financial crisis (2008-2009) and during the COVID-19 pandemic (2020). The general decreases in energy emissions are mainly due to the increased use of renewables, the switch from solid fuels to gas, greater energy and technical efficiency and decreases in fuel combustion in manufacturing industries. Energy policies and measures related (see Section 3.5.4 for more details) have driven historical changes and will propel future projected changes.

Domestic transport remains the second largest source of EU greenhouse gas emissions over the whole period. Its share of total domestic emissions was around 27% in 2024 and remains at about the same level in both 2030 scenarios. In contrast to the energy sector, domestic transport emissions increased over much of the historical period, reaching a peak in the late 2010s before dropping sharply in 2020 during the COVID-19 pandemic and then partially rebounding afterwards. Compared with 1990, **domestic transport** emissions are projected to remain slightly above their 1990 level (+0.2%), whereas in the 'with additional measures' scenario they are projected to fall by about 13%. Specifically, emissions decline from 674.7 $MtCO_2$-eq in 1990 to 676.1 $MtCO_2$-eq in 2030 in the WEM scenario, and to 586.5 $MtCO_2$-eq in the WAM scenario. Looking further ahead, both scenarios project a marked decline after 2030, with a steeper reduction in the WAM scenario.

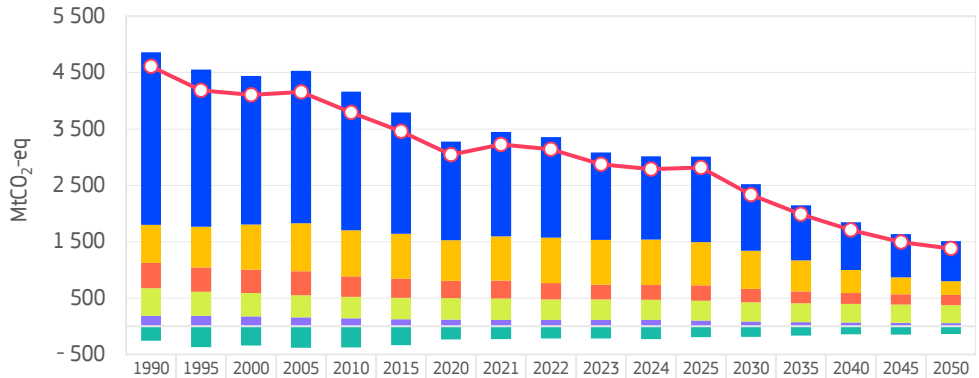
Industrial processes account for a smaller but still significant share of EU GHG emissions, representing about 9% of total domestic emissions in 2024 and remaining broadly at this level in 2030 in both scenarios. Relative to 1990, emissions from industrial processes are projected to fall by about 48% by 2030 in the WEM scenario and by about 52% in the WAM scenario. Emissions decrease from 449.9 $MtCO_2$-eq in 1990 to 232.9 $MtCO_2$-eq in 2030 with existing measures, and to 216.4 $MtCO_2$-eq with additional measures. This suggests that further reductions are expected, but at a more gradual pace than in the energy sector.

Agriculture remains one of the more stable sources of EU greenhouse gas emissions over time. Its share in total domestic emissions rises from around 12% in 2024 to about 14% in the WEM scenario and to about 15% in the WAM scenario, mainly because projected reductions in other sectors are faster. Historically, agricultural emissions have declined moderately compared with 1990, but without the sharp drops seen in sectors more closely linked to economic cycles or energy demand. Compared with 1990, agriculture emissions are projected to decline by about 30% by 2030 in the WEM scenario and by about 32% in the WAM scenario. Emissions fall from 487.3 $MtCO_2$-eq in

1990 to 341.5 MtCO2-eq in 2030 with existing measures, and to 331.8 $MtCO_2$-eq with additional measures. The difference between the two scenarios is relatively limited, indicating that projected additional measures deliver only modest extra reductions in this sector compared with domestic transport or energy.

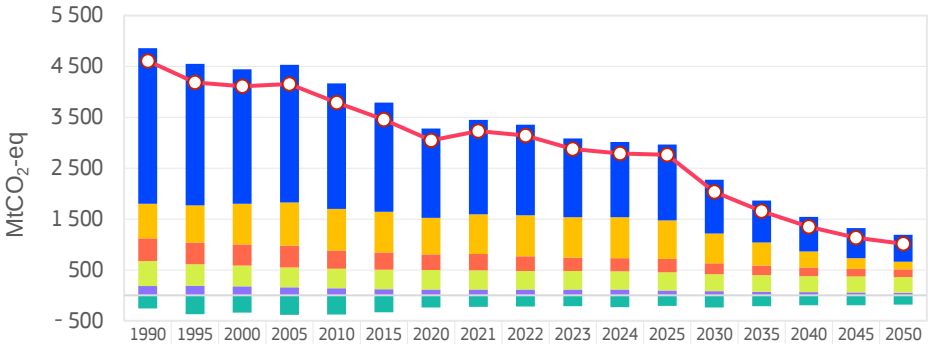
Figure 34: Historic and projected GHG emissions and removals by sector – 'with existing measures' and 'with additional measures'

With existing measures



	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2050
Energy (excluding transport)	3 062	2 784	2 640	2 704	2 462	2 150	1 752	1 856	1 783	1 550	1 478	1 515	1 183	978	851	768	711
Domestic transport	675	727	800	850	818	794	722	784	805	796	805	770	676	549	405	299	244
Industrial processes	450	430	414	429	364	342	306	316	290	263	260	271	233	211	196	184	181
Agriculture	487	422	411	389	379	382	381	378	364	363	359	355	341	333	329	324	320
Waste	185	189	177	159	141	122	116	115	114	113	111	98	86	75	67	61	56
LULUCF	-258	-372	-342	-383	-378	-337	-237	-226	-218	-216	-231	-193	-188	-164	-144	-147	-136
EU net domestic GHG emissions	4 609	4 187	4 107	4 154	3 790	3 458	3 044	3 227	3 142	2 873	2 786	2 818	2 333	1 984	1 705	1 490	1 377

With additional measures

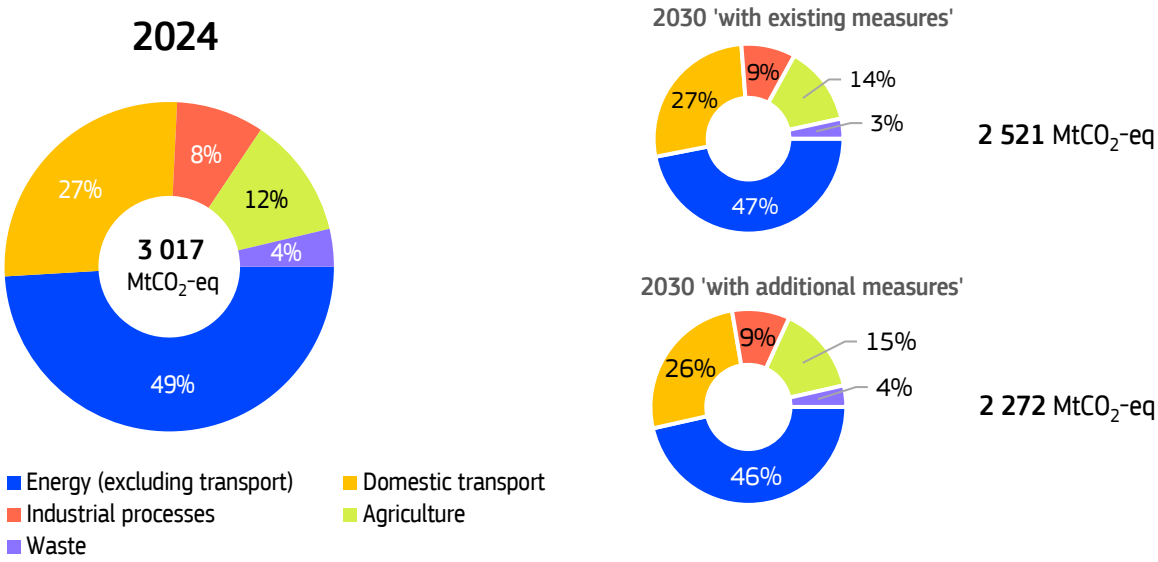


	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2050
Energy (excluding transport)	3 062	2 784	2 640	2 704	2 462	2 150	1 752	1 856	1 783	1 550	1 478	1 492	1 055	829	681	592	529
Domestic transport	675	727	800	850	818	794	722	784	805	796	805	753	587	454	312	205	153
Industrial processes	450	430	414	429	364	342	306	316	290	263	260	266	216	189	170	157	152
Agriculture	487	422	411	389	379	382	381	378	364	363	359	358	332	323	316	311	305
Waste	185	189	177	159	141	122	116	115	114	113	111	96	80	71	63	57	53
LULUCF	-258	-372	-342	-383	-378	-337	-237	-226	-218	-216	-231	-206	-240	-214	-197	-193	-181
EU net domestic GHG emissions	4 609	4 187	4 107	4 154	3 790	3 458	3 044	3 227	3 142	2 873	2 786	2 761	2 032	1 654	1 348	1 130	1 013

Note: Historical data up to 2024; projections from 2025 onwards. See CTF Tables 7-8 for the data reported in kilo tonnes of CO_2-eq.

Sources: Annual EU GHG inventory 1990-2024, EU Member States' GHG emission projections submitted in 2025 and 2026 under the Governance Regulation.

Figure 35: Historic and projected share of total domestic GHG emissions by sector



Note: See CTF Tables 7-8 for the data reported in kilo tonnes of CO_2-eq.

Sources: Annual EU GHG inventory 1990-2024, EU Member States' GHG emission projections submitted in 2025 and 2026 under the Governance Regulation.

3.7.3 Projections by gas

Figure 36 shows a significant decline in EU domestic GHG emissions, excluding LULUCF, between 1990 and 2050 in both projection scenarios.

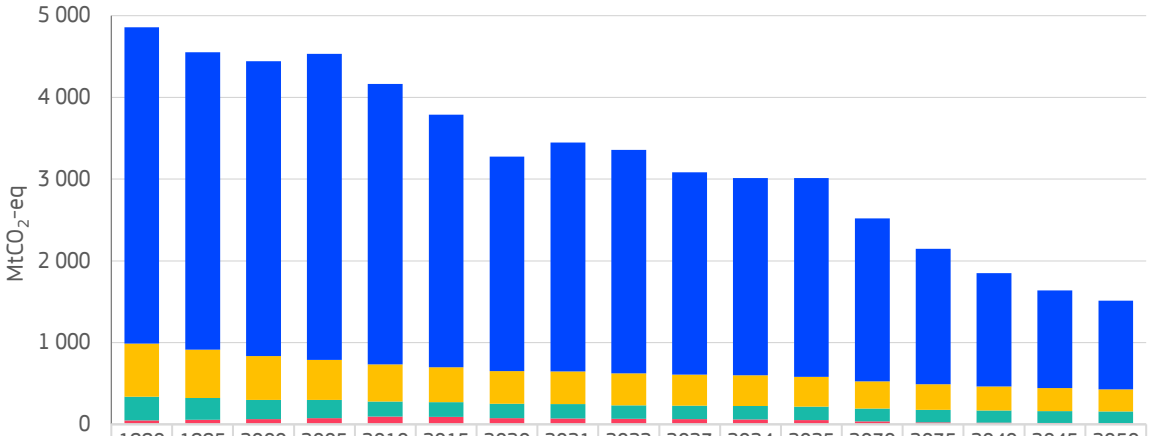
Carbon dioxide (CO_2) remains by far the largest contributor to total greenhouse gas emissions throughout the period, accounting for most of the projected reductions in both scenarios. Emissions of methane (CH_4), nitrous oxide (N_2O) and fluorinated gases (F-gases) also decline steadily over time, although more slowly than CO_2. As a result, the relative contribution of non-CO_2 gases to total emissions increases slightly in the long term, particularly in the WAM scenario, in which overall emissions decrease more rapidly.

Figure 37 shows that CO_2 remains the dominant greenhouse gas in the EU emissions profile, accounting for 80% of net domestic GHG emissions in 2024. Methane (CH_4) is the second largest contributor at 12%, followed by nitrous oxide (N_2O) at 6% and fluorinated gases (F-gases) at 2%.

By 2030, CO_2 remains the largest contributor, but its share decreases slightly to 79% in the WEM scenario and 78% in the WAM scenario. In contrast, the shares of CH_4 and N_2O increase modestly, reaching 14% and 6% in the WEM scenario, and 14% and 7% in the WAM scenario, respectively. The share of F-gases declines to around 1% in both scenarios, reflecting continued reductions in these emissions.

Figure 36: Historic and projected domestic GHG emissions by gas, excluding LULUCF

With existing measures

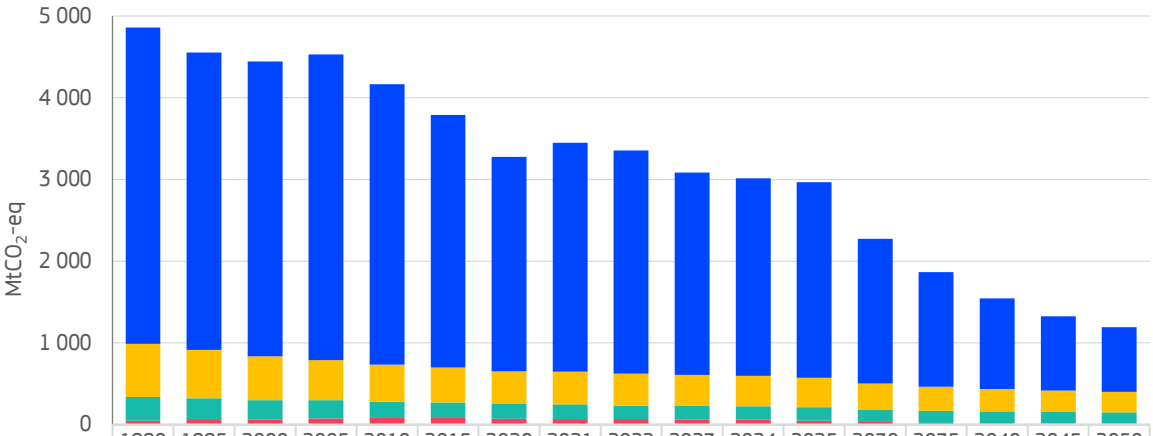


	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2050
CO2	3 872	3 639	3 607	3 742	3 431	3 092	2 624	2 802	2 733	2 475	2 415	2 432	1 994	1 658	1 385	1 194	1 085
CH4	651	592	538	489	453	426	400	397	389	381	374	364	334	311	295	282	271
N20	287	265	235	224	187	180	178	179	167	167	165	164	158	153	149	145	143
F-gases	50	56	63	77	93	92,4	74	70	67	62	59	51	35	25	20	16	15

Note: Data excluding indirect CO_2 emissions. See CTF Tables 7-8 for the detailed data reported in kilo tonnes of CO_2-eq.

Sources: Annual EU GHG inventory 1990-2024, EU Member States' GHG emission projections submitted in 2025 and 2026 under the Governance Regulation.

With additional measures

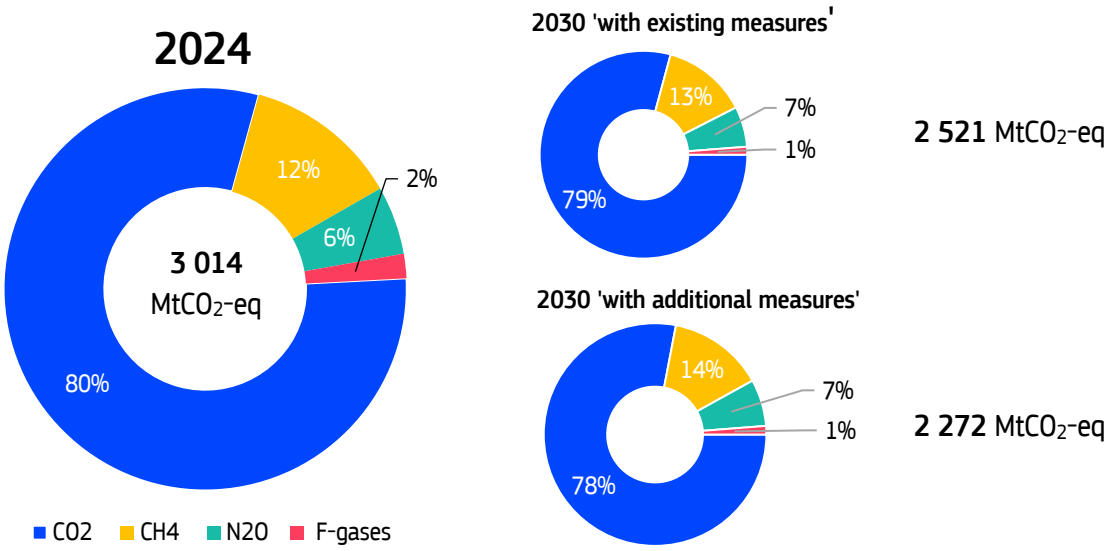


	1990	1995	2000	2005	2010	2015	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2050
CO2	3 872	3 639	3 607	3 742	3 431	3 092	2 624	2 802	2 733	2 475	2 415	2 392	1 770	1 403	1 108	906	791
CH4	651	592	538	489	453	426	400	397	389	381	374	360	317	293	275	262	251
N20	287	265	235	224	187	180	178	179	167	167	165	167	154	149	146	142	139
F-gases	50	56	63	77	93	92	74	70	67	62	59	48	32	22	17	14	12

Note: Data excluding indirect CO_2 emissions. See CTF Tables 7-8 for the detailed data reported in kilo tonnes of CO_2-eq.

Sources: Annual EU GHG inventory 1990-2024, EU Member States' GHG emission projections submitted in 2025 and 2026 under the Governance Regulation.

Figure 37: Share of domestic GHG emissions by gas in 2024 and projected share by gas for 2030, excluding LULUCF and indirect CO_2 emissions



Note: Data excluding indirect CO_2 emissions.

Sources: Annual EU GHG inventory 1990-2024, EU Member States' GHG emission projections submitted in 2025 and 2026 under the Governance Regulation.

3.7.4 Methodology

Models and approaches

From 15 March 2021, and every two years after that, EU Member States have to report their GHG projections in accordance with Article 18.1(b) of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action (Governance Regulation) and the related Implementing Regulation (EU) 2020/1208, Regulation (EU) 2020/1208, and its amendment, Implementing Regulation (EU) 2024/1281.

The EU projections are compiled as the sum of EU Member States' individual projections. The data supplied by Member States must meet certain quality requirements. The European Commission (DG CLIMA) is responsible for coordinating the quality assurance and quality control (QA/QC) activities for greenhouse gas projections at EU level and for ensuring that the requirements of the QA/QC programme are achieved. The European Environment Agency (EEA) is responsible for the annual implementation of the QA/QC procedures; see below.

Detailed descriptions of the individual projection methodologies that EU Member States used to project their greenhouse gas emissions and further information on their sensitivity analyses, key parameters and assumptions are available in the reports provided alongside their submissions under Article 18 of the Governance Regulation to the 'Reportnet' platform hosted by the European Environment Agency[33] and in the BTRs of individual Member States.

As 2026 was a non-compulsory reporting year, only Belgium, Estonia, Germany, Ireland, Italy, Lithuania, Romania and Denmark submitted updated projections. For all other Member States, GHG projections submitted in 2025 are used.

The strengths and weaknesses of aggregating the EU's greenhouse gas projection from individual EU Member States' projections are as follows:

Strengths

- EU Member States have the best knowledge of their national circumstances, e.g. their national policies and measures, their exact specifications and expected future development. This puts them in the best position to come up with national projections that best reflect their national circumstances.
- EU Member States can use tailor-made national tools and models that are best suited to presenting their individual contexts.
- The European Commission gives EU Member States guidance on key parameters and assumptions. This approach helps harmonise parameters that may be similar among EU Member States, such as fuel import prices. At the same time, for some EU Member States there may be reasons why these parameters could

[33] 2025 GHG projections by EU Member States: https://reportnet.europa.eu/public/dataflow/1478, 2026 GHG projections by EU Member States: https://reportnet.europa.eu/public/dataflow/1825. Analysis of Member States' 2025 GHG projections: https://www.eionet.europa.eu/etcs/etc.-cm/products/etc.-cm-report-2025-07/@@download/file/ETC%20CM%20Report%202025%2007.pdf.

develop differently. EU Member States can therefore choose to set different values for key parameters and assumptions to best reflect their national circumstances.

Weaknesses

- A potential weakness of the projection methodology is that the aggregation of the EU's projection becomes less accurate if there are errors in the data of individual EU Member States. This risk is mitigated by the comprehensive quality assurance and control procedure applied[34].

Representation of data

The compilation of projections incorporates the most recent available data. The breakdown by sector is as follows:

- energy (Common Reporting Tables – CRT 1, without transport);
- transport (CRT 1.A.3);
- industrial processes and product use (CRT 2);
- agriculture (CRT 3);
- land use, land-use change and forestry (LULUCF) (CRT 4);
- waste (CRT 5);
- memo items: international bunkers.

In addition to the sectors and memo items listed here, indirect CO_2 emissions are included in the totals reported in this chapter.

The gases covered are listed below:

- CO_2
- CH_4
- N_2O
- HFCs
- PFCs
- SF_6
- an unspecified mix of hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs)
- NF_3.

Changes in methodology

The 2025 reporting cycle under the EU's Governance Regulation introduced new reporting elements aimed at improving transparency and completeness[35]. These include the mandatory reporting of projected values of CO_2 capture for permanent storage based on the source of emissions if negative emissions have been incorporated

[34] ETC-CM Report 2025/04, Analysis of Member States' 2025 GHG projections Submitted under Art 38 (1)(b) of the Regulation on the Governance of the Energy Union and Climate Action (EU) 2018/1999, ETC CM report 2025/07: Analysis of Member States' 2025 GHG projections — Eionet Portal

[35] Commission Implementing Regulation (EU) 2024/1281 amending Implementing Regulation (EU) 2020/1208, https://eur-lex.europa.eu/eli/reg_impl/2024/1281/oj/eng.

into the category values in Table 1a (biogenic CO_2 capture (e.g. Bioenergy with carbon capture and storage vs fossil fuel-based CO_2 capture)).

Key parameters and assumptions

The key parameters that underpin individual EU Member States' projections are submitted under Article 18 of the Governance Regulation. They undergo the quality assurance and control process documented in a methodology report. Population, GDP, and EU ETS price were among the most commonly reported parameters, while more specialised variables were used for energy, agriculture, forestry and other land use and industrial projections.

The information has been aggregated to create EU-wide information either by aggregating to EU level (GDP, population) or by calculating the weighted average value (monetary data, except GDP). Using this approach, the key parameters at EU level are reported in CTF Table 11, which is submitted together with this BTR.

In addition to aggregating EU Member States' own projections, the European Commission regularly conducts comprehensive assessments of the EU's progress towards reaching its climate targets and achieving climate neutrality by 2050. A key example is the **impact assessment accompanying the proposal for the 2040 climate target**, which evaluated multiple scenarios and sensitivity parameters to ensure robustness in its findings. The evaluation considered a range of **sensitivity tests**, including variations in key assumptions such as the availability of sustainable low-carbon fuels. These tests examined how factors such as higher capital expenditures, delayed technological deployment, or shifts in fuel availability could influence the feasibility and cost-effectiveness of the transition. By systematically analysing these uncertainties, the European Commission ensures that its projections remain valid under differing conditions, strengthening the EU's commitment to evidence-based policymaking in line with its long-term climate objectives. Further technical details can be found in the impact assessment documentation.

Information on the sensitivity analysis

EU legislation (Annex XXV, Tables 6 and 7, of the EU Governance Implementing Regulation) provides for structured reporting on EU Member States' sensitivity analyses, which they report along with their greenhouse gas emission projections. This provides the opportunity to highlight and take into account the effort that EU Member States make to analyse how changes to the different parameters impact their individual greenhouse gas projections. In their most recent reporting cycle, 20 EU Member States reported information on their sensitivity analyses. EU Member States reported up to 14 scenarios. In each scenario, one or several parameters were varied.

Due to the wide range of parameters varied by EU Member States, sensitivity analyses are not aggregated to EU level. Table 17 shows which parameters EU Member States varied in their sensitivity analyses.

Table 17: Parameters which were varied in the sensitivity analyses of the various Member States

EU Member State	Number of sensitivity scenarios	Parameters varied
Austria	2	Gross domestic product
Belgium	2	Number of heating degree days (HDD)
Bulgaria	-	
Croatia	4	Population
		Gross domestic product
		Gross value added
		Number of passenger-kilometres
		Freight transport tonnes-kilometres
		International (wholesale) fuel import prices
		EU ETS carbon price
		Number of heating degree days (HDD)
		Number of cooling degree days (CDD)
Cyprus	2	Mild / Extreme Weather
		GHG Intensity to Calculate Emissions
Czechia	4	Population
		Number of passenger-kilometres
		Freight transport tonnes-kilometres
		International (wholesale) fuel import prices
		Milk production
		Dairy cattle population
		Amount of nitrogen in synthetic fertilisers applied
		Wood harvest quantity
		All energy services demand and industry production
		F-gases consumption in refrigeration and air conditioning
Denmark	-	
Estonia	4	Population
		Gross domestic product
		Total felling volume
Finland	2	Gross value added
France	2	Population
		Gross domestic product
		Number of passenger-kilometres
		Freight transport tonnes-kilometres
		International (wholesale) fuel import prices
		EU ETS carbon price
		Number of heating degree days (HDD)
		Number of cooling degree days (CDD)
Germany	14	EU ETS carbon price

EU Member State	Number of sensitivity scenarios	Parameters varied
		hydrogen price (blue)
		hydrogen price (green)
		wholesale price hydrogen (RFNBO)
		natural gas price (industry sector)
		natural gas price (building sector)
		use of coal-fired power plants in the grid reserve
		full-load hours of renewable energy sources
		heat pump investment costs
		production volumes in industry
		electricity price in industry
		availability of advanced biofuels
		CO_2 fleet targets for passenger cars and light commercial vehicles
Greece	2	Population
		Gross domestic product
		Gross value added
		International (wholesale) fuel import prices
		EU ETS carbon price
Hungary	-	
Ireland	1	International (wholesale) fuel import prices
Italy	-	
Latvia	6	Population
		Gross domestic product
		Gross value added
		Number of passenger-kilometres
		Freight transport tonnes-kilometres
		International (wholesale) fuel import prices
		EU ETS carbon price
		Number of heating degree days
		Number of cooling degree days
		Milk yield
		Solid waste disposal – increase inert waste content in disposed waste (decrease of biological waste content)
		Domestic wastewater handling – decrease of population consumption to average value
		LULUCF – Regenerative felling compared to WEM scenario
Lithuania	3	EU ETS carbon price
		Freight transport tonnes-kilometres
		Number of passenger-kilometres
		Nitric acid production
		Crop residues

EU Member State	Number of sensitivity scenarios	Parameters varied
		Cultivation of histosol
		Inorganic nitrogen fertiliser
		Population with decentralised wastewater connection
Luxembourg	1	No parameters reported
Malta	8	Cattle
		Poultry
		Swine
		Rabbits
		Sheep
		Goats
		Horses
The Netherlands	1	EU ETS carbon price
		Crude oil price
		Natural gas price
		Coal price
		Electricity price
Poland	-	
Portugal	-	
Romania	3	EU ETS carbon price
		Population
		International (wholesale) fuel import prices
		Gross domestic product
		Gross value added
Slovakia	-	
Slovenia	4	Number of passenger-kilometres
		Freight transport tonnes-kilometres
		Share of biofuels in transport
		Share of foreign vehicles purchasing fuel in Slovenia in total foreign vehicles trespassing Slovenia
Spain	13	Population
		Gross domestic product
		Dairy cattle
		Non-dairy cattle
		Sheep
		Pig
		Poultry
Sweden	1	Average relative forest growth

Source: Information reported by EU Member States on projections in 2025 and 2026.

4 Climate change impacts and adaptation

4.1 Introduction

Scientific evidence continues to demonstrate that climate change poses severe and escalating risks to humanity, ecosystems, infrastructure and economic activity across Europe, with climate-related extreme weather events becoming more frequent and more damaging.

According to the European State of the Climate (ESOTC) 2025 report Europe is the fastest-warming continent, and the Arctic is the fastest-warming region on Earth, with temperatures increasing by around 0.75 °C per decade. The archipelago of Svalbard, in the European Arctic, is one of the fastest-warming places on our planet, warming at a rate of 1.5-2 °C per decade over the past 30 years. Globally, 2025 was the third warmest year on record, with each of the past 11 years ranking among the 11 warmest ever recorded and the past three years standing as the three warmest.

Public concern about climate change remains high and has risen further since the first BTR. According to the 2025 Eurobarometer survey on climate change, 85% of Europeans consider climate change a serious problem, representing an increase of 10% compared with the previous 2023 survey. Support for climate action also remains strong, with 81% of respondents supporting the EU objective of becoming climate-neutral by 2050. Notably, 38% of respondents reported feeling personally exposed to climate-related risks, highlighting how increasingly the impacts of climate change on European's daily lives are being felt.

Across Europe and globally, climate change is already affecting ecosystems, health, food production, water resources, infrastructure, economic activity and livelihoods, with increasingly frequent and severe climate and weather-related extreme events. Despite global efforts to reduce greenhouse gas emissions, these impacts are expected to be more severe at least in the short and middle term, given the warming potential of the greenhouse gas emissions already produced. Adaptation is therefore indispensable, alongside ambitious mitigation actions, to reduce vulnerability, strengthen resilience and enhance preparedness. The complementary nature of mitigation and adaptation is reflected in the EU's updated nationally determined contribution under the Paris Agreement[36], which reaffirms the EU's commitment to both ambitious emission reductions and greater climate resilience. Advancing both in a mutually reinforcing way is essential to support a just transition, protect people and prosperity, and achieve the long-term goals of the Paris Agreement in light of the best available science.

In line with the EU Strategy on Adaptation to Climate Change, the EU maintains its long-term vision that, 'in 2050, the EU will be a climate-resilient society, fully adapted to the unavoidable impacts of climate change'[37]. This vision is firmly anchored in the European

[36] UNFCCC NDC registry, https://unfccc.int/sites/default/files/2025-11/DK-2025-11-05%20EU%20NDC.pdf.

[37] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082.

Climate Law, which provides the framework for continuous progress by the EU and EU Member States in enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change in accordance with Article 7 of the Paris Agreement.

Strengthening climate resilience and preparedness is also becoming increasingly central to the EU's broader policy agenda. The political guidelines for the 2024-2029 European Commission underline climate resilience and preparedness as key dimensions of the priority of sustaining quality of life in the EU. Recent cross-cutting policy frameworks such as the EU Preparedness Union Strategy and the Competitiveness Compass give greater weight to these statements. The EU Preparedness Union Strategy is a comprehensive plan to improve the EU's preparedness and readiness for future crises. It intends to strengthen the coordination and efficiency of existing EU-wide and national strategies, and to support a culture of resilience to all hazards, including those related to climate, by getting all levels of society involved. As for the Competitiveness Compass, meant to restore Europe's dynamism and boost its economic growth, also asks the EU and EU Member States to regularly update climate risk assessments and improve critical infrastructure by taking the results of those assessments into account. Both policy documents revolve around the concept of 'preparedness by design', while the EU Prepared Union Strategy explicitly sets out to embed 'preparedness by design' across the board in EU legislation, policies and programmes.

Owing to the accelerating climate risks, the Commission presented on 27 October 2026 the EU Framework for Climate Resilience[38,39]. The new Framework strengthens Europe's ability to anticipate and manage climate risks, embed climate resilience across all major policy areas, protect people and places, and prevent avoidable damage. It introduces a proposal for a European Climate Resilience Law backed by practical tools to drive a fundamental shift from reacting to disasters to getting ahead of climate impacts and avoiding damages. The proposed **European Climate Resilience Law**, is designed to ensure that the EU and Member States act together and manage their climate risks in concert, based on a common reference trajectory for global warming.

The following sections describe progress made since the first BTR in implementing the EU Strategy on Adaptation to Climate Change, enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change across the EU. They highlight developments in governance, climate risk assessments, planning and implementation, monitoring and support mechanisms in accordance with Chapter IV of decision 18/CMA.1.

4.2 National circumstances, institutional arrangements

The EU is a unique economic and political union of 27 European countries, each with its own specific national circumstances, institutional arrangements and legal frameworks.

[38] COM(2026) 720

[39] COM(2026) 730

Climate change is an area of shared competence between the EU and EU Member States, meaning that both may legislate and adopt legally binding acts in this area. While EU Member States are primarily responsible for implementing adaptation actions and measures, the EU provides a common strategic, legislative and governance framework to promote coordinated action and ensure coherence and the exchange of good practices across EU Member States. This engagement reflects the transnational nature of climate risks and the importance of international cooperation in building climate resilience.

Each EU Member State has unique vulnerabilities to climate change, influenced by geographic, economic, environmental and socio-economic factors. Slow onset impacts such as rising temperatures, changing precipitation patterns, sea-level rise and ocean acidification, together with more frequent and intense extreme weather events, affect regions and sectors differently. The EU's outermost regions are also specifically vulnerable to climate change due to increased exposure to hurricanes.

In addition to differences in physical exposure, adaptive capacity varies across the EU. This is shaped by a range of socio-economic factors, including levels of economic development, income distribution, public sector capacity, demographic trends and the effectiveness of governance systems. These factors influence the ability of regions, sectors and communities to anticipate, respond to and recover from climate impacts.

Despite these diverse national circumstances, the EU promotes a coordinated approach to ensure that adaptation is effectively integrated into national and sectoral planning across EU Member States. The European Commission is the institution responsible for adopting EU-wide adaptation strategies, and for assessing EU and Member States' measures every five years to ensure that they are consistent with the aim of making progress on adaptation.

The 2021 European Climate Law provides the overarching legal framework for adaptation at EU level. It requires EU institutions and Member States to make continuous progress to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change, in accordance with Article 7 of the Paris Agreement. It also requires EU Member States to adopt and implement national adaptation strategies and plans, taking into consideration the EU Strategy on Adaptation to Climate Change, based on robust climate change and vulnerability analyses, progress assessments and indicators, and guided by the best available and most recent scientific evidence.

Progress in adaptation policies and actions, is reported and monitored under the Governance Regulation. Under the regulation, EU Member States report every two years on their national adaptation planning, strategies and actions, including progress in implementation and planned strategies. The regulation builds on previous EU climate monitoring legislation. It also requires EU Member States to integrate adaptation goals into their national energy and climate plans (NECPs). The information submitted by EU Member States is subsequently synthesised by the European Commission into an

EU-level assessment report, while underlying country-level information is made publicly available through the European Climate Adaptation Platform (Climate-ADAPT).

Reporting under the Governance Regulation demonstrates continued progress in formalising adaptation governance arrangements across EU Member States. A growing number of EU Member States have established dedicated institutional structures, legal frameworks and coordination mechanisms to support adaptation planning and implementation. In most EU Member States, adaptation is coordinated by environment ministries or specialised climate units, often supported by inter-ministerial committees and other bodies (European Environment Agency (EEA), 2026)[40].

The EU Strategy on Adaptation to Climate Change adopted in 2021 presents the EU's cross-cutting efforts to adapt to the unavoidable impacts of climate change and become climate-resilient by 2050. The strategy sets out an ambitious path across an exceptionally broad range of policy areas. It is structured around four main objectives: to make adaptation smarter, swifter and more systemic, to step up international action on adaptation to climate change, to increase resilience to the impacts of climate change, and to manage the associated risks.

The EU Framework for Climate Resilience comprises a Commission communication[41] and a legislative proposal[42] for the European Climate Resilience Law, which must still be negotiated and adopted by the European Parliament and Council.

Water and ocean resilience have also become dedicated policy priorities. The European Water Resilience Strategy, adopted on 4 June 2025, aims to restore and protect the water cycle from source to sea, build a water-smart economy and secure clean and affordable water and sanitation for all. It is accompanied by a Commission Recommendation on water efficiency, with the objective of improving water efficiency in the EU by at least 10% by 2030, and foresees better water retention and stronger early warning and monitoring of floods and droughts. The European Ocean Pact, adopted the same week, brings EU ocean policy into a single framework, covering the protection and restoration of ocean health, support for coastal and island communities and the outermost regions, and ocean research, knowledge and observation. It is to be complemented by a European Ocean Act. Under the Ocean Pact, the Commission adopted the European ocean observation initiative, OceanEye (COM(2026)268) on 3 June 2026, aiming for the EU to provide 35% of global ocean observing system by 2035. To achieve the Pact's targets, the Commission plans a European Ocean Act, which will set the legal basis for governing OceanEye by the end of 2026.

The European Environment Agency (EEA) plays a key role in supporting the European Commission's policy development and implementation by providing reliable environmental and analytical expertise. It also hosts an efficient reporting infrastructure

[40] Climate resilience in Europe, 2025 – progress and challenges: https://www.eea.europa.eu/en/analysis/publications/climate-resilience-in-europe-2025-progress-and-challenges.

[41] COM(2026) 720.

[42] COM(2026) 730.

for managing national and aggregated data flows. Working closely with its network, the European Environment Information and Observation Network (EIONET), the EEA informs policymakers, decisions-makers and the public of the state of the EU's environment, climate change and sustainability issues, thereby supporting the making of steady progress in the implementation of EU environmental and climate mitigation and adaptation policies.

4.3 Impacts, risks and vulnerabilities

In March 2024, the EEA published the first European Climate Risk Assessment (EUCRA-1), providing the first comprehensive assessment of major climate risks facing Europe. The assessment synthesises scientific evidence of climate hazards, vulnerabilities and risks across sectors and regions and identifies priorities for action to strengthen Europe's resilience to climate change. EUCRA-1 is a key milestone in the EU's climate risk management framework and provides an important evidence base for adaptation policymaking, building on and complementing the existing knowledge base on climate impacts and risks for Europe. It is a crucial step in understanding and identifying the priorities to tackle and the measures to take to strengthen Europe's resilience to climate change.

This section provides a summary of some of the key findings of the EUCRA-1 report on current and projected trends in climate-related hazards and impacts, the approaches, methodologies and tools used to derive them, and associated uncertainties and challenges. Where appropriate, it is complemented by insights into some of the aspects of it that will be improved in EUCRA-2, scheduled for publication in 2028. This second iteration has been identified as necessary to an expanded assessment of climate-related risks, with a longer-term perspective extending to the end of the century and beyond where needed.

4.3.1 Current and projected climate trends and hazards

Climate change is increasing the frequency, intensity and duration of many climate-related hazards across Europe. These include heatwaves, droughts, extreme precipitation, river and coastal flooding, wildfires and a rise in sea levels (Figure 38). In the marine environment, ocean warming, marine heatwaves, acidification and deoxygenation are intensifying, and European sea surface temperatures reached a record high in 2025 for the fourth year running.

The level of global warming for 2025 is estimated to be around 1.4 °C above the average for the pre-industrial period (1850-1900)[43]. If warming continues at the current rate, the Paris Agreement's limit of 1.5 °C for long-term global warming could be reached by the end of this decade. Since the 1980s, Europe has been warming twice as fast as the global average, making it the fastest-warming continent (ESOTC, 2025). Changing weather patterns leading to more frequent and more intense summer heatwaves,

[43]Climate indicators, https://climate.copernicus.eu/climate-indicators/temperature.

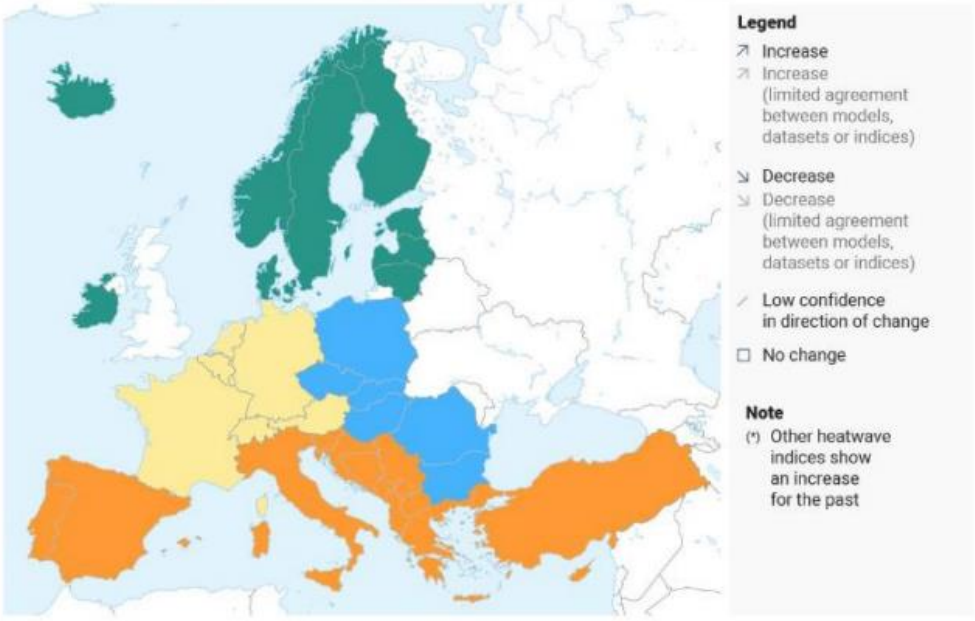
increasing solar radiation due to less air pollution, decreasing snow cover and the fact that parts of Europe extend into the Arctic (the fastest-warming region on Earth), are all factors contributing to this trend.

Most climate hazards in Europe will further increase during the 21st century, even in optimistic scenarios compatible with the Paris Agreement, but the magnitude and pace of change depend on global efforts to reduce greenhouse gas emissions.

Figure 38: Observed and projected trends in key climate-related hazards in different European regions

Land regions	Northern Europe			Western Europe			Central-Eastern Europe			Southern Europe		
	Past	Future		Past	Future		Past	Future		Past	Future	
		Low	High		Low	High		Low	High		Low	High
Mean temperature	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Heat wave days	□(*)	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Total precipitation	↗	↗	↗	↗	⟋	↘	↗	↗	⟋	↘	↘	↘
Heavy precipitation	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Drought	↗	↘	↘	↗	⟋	↗	↗	⟋	↗	↗	↗	↗

European regional seas	Past	Future
Sea surface temperature	↗	↗
Sea level	↗	↗



Notes: Underlying climate variables are: heatwaves (days with maximum temperatures above 35°C), heavy precipitation (maximum 1-day precipitation), and drought (using a standardised precipitation evapotranspiration index over 6 months (SPEI-6, Hargreaves' method)). Time periods and scenarios are past (1952-2021); future until the end of the century (2081-2100 relative to 1995-2014); low scenario (SSP1-2.6); and high scenario (SSP3-7.0).

Source: EUCRA

4.3.2 Observed and potential impacts of climate change

As highlighted above, the impacts of climate change are already evident across Europe. The hazards highlighted in Section 4.3.1 are already having significant impacts on ecosystems, human health, water resources, food security, infrastructure and economic activities. Recent extremes have demonstrated the growing consequences of heatwaves, droughts, wildfires and flooding, while impacts on biodiversity are becoming increasingly apparent. Looking forward, these effects are expected to intensify and interact, creating compound and cascading risks across sectors and

regions, with many climate risks already assessed as being at critical level (EUCRA, 2024).

The EUCRA-1 systematic risk assessment process has identified and assessed 36 major climate risks for Europe, grouped into five broad clusters: ecosystems, food, health, infrastructure, and economy and finance (see Figure 41 in next section). Depending on their nature, each of these risks alone has the potential to cause significant environmental degradation, economic damage, social emergencies and political turbulence. However, their combined effects are even worse. The assessment also found that all EU outermost regions face critical risks to their marine ecosystems from ocean warming and marine heatwaves that require urgent action.

The assessment reveals that most of the EU's sectoral policies are directly or indirectly exposed to climate risks. Public health, the environment, agriculture and energy are among the policy areas most directly affected by major climate risks in Europe that require urgent action. The EUCRA report points out that various other EU policy areas are also highly exposed, in particular industry, trade and the economy, and social and territorial cohesion. Climate risks and EU policies are interconnected in many ways. Most EU policies already include decision-making processes that can take climate risks into account. The wealth of evidence presented in the EUCRA report feeds into these processes.

Drought
Dry conditions prevailed over most of Europe for a large part of 2025, driven by rainfall amounts that were far below average, especially over a large region spreading from northwestern France to the Black Sea. For the whole of Europe, it was one of the three driest years since 1992 in terms of soil moisture. River flows were below average for 70% of European rivers in 2025. These drought conditions had a major impact on ecosystems, farming and transport, and even led to the issue of official drought warnings early in the year in regions traditionally not affected. For example, after the driest March on record in Germany, in April water levels in the Rhine River only reached half of their usual values (Joint Research Centre (JRC, 2025)).

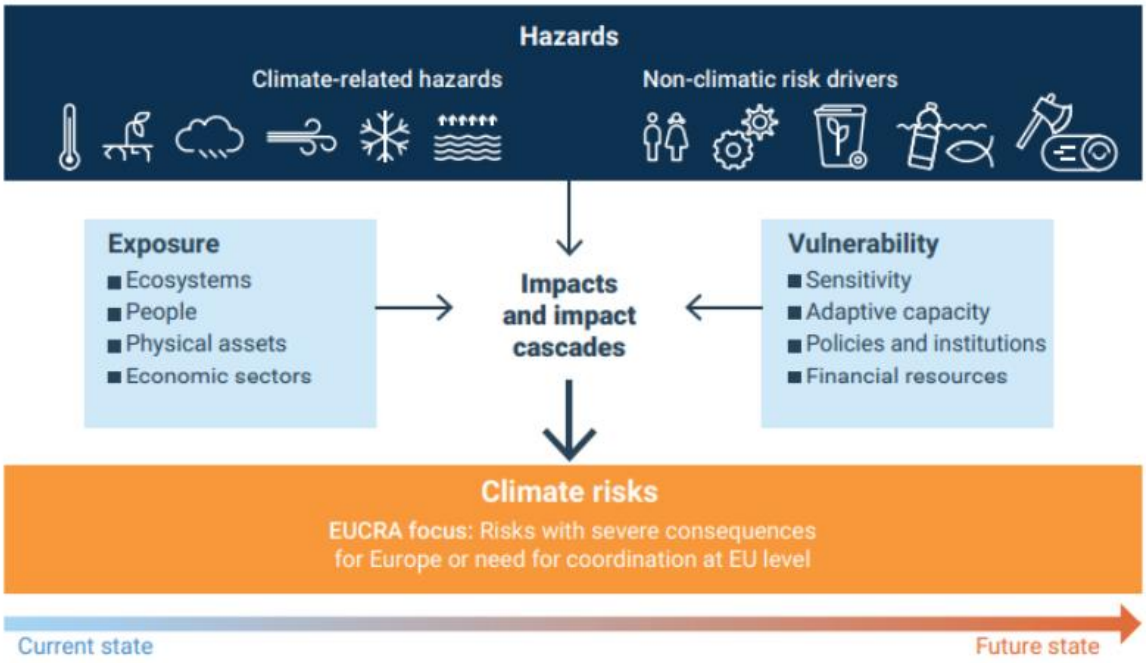
Wildfires
The hot and dry conditions experienced across the continent made the propagation of wildfires increasingly prevalent, and fire danger was above average in most of Europe during the summer (ESOTC, 2025). In southern Europe, there were even more days than average with 'extreme' fire danger. As a result, over 1 million hectares (almost double the average) were burnt last year across the continent, which constitutes a new record (JRC, 2026).

Economic activity
Summer crop yields in some eastern European countries were strongly reduced, especially in rainfed areas (JRC, 2025). Significant sunflower yield losses were also recorded, remaining 20% below average in Romania and staying at levels comparable with the previous catastrophic year in Bulgaria.

4.3.3 Approaches and methodologies

Following the definition of the Intergovernmental Panel on Climate Change (IPCC), in EUCRA's methodological framework impacts and associated risks are defined as the interaction of the exposure and vulnerability (Figure 39). In addition to climate-related hazards, EUCRA considers non-climatic risk drivers as contributing factors to the exposure and vulnerability components of risks. In practice, the geographic location of assets or population, land use types, or even environmental hazards that can have multiplier effects, define exposure. On the other hand, socio-economic factors such as economic prosperity and inequality, the state of public finances, demographic dynamism, governance, health status and educational attainment determine vulnerability levels.

Figure 39: Definition of risk in EUCRA as the interaction between hazards, exposure and vulnerability (following IPCC definition)



Source: EUCRA.

The report builds largely on available scientific knowledge, integrating various sources of evidence such as:

- reports and data from the Copernicus Climate Change Service (C3S),

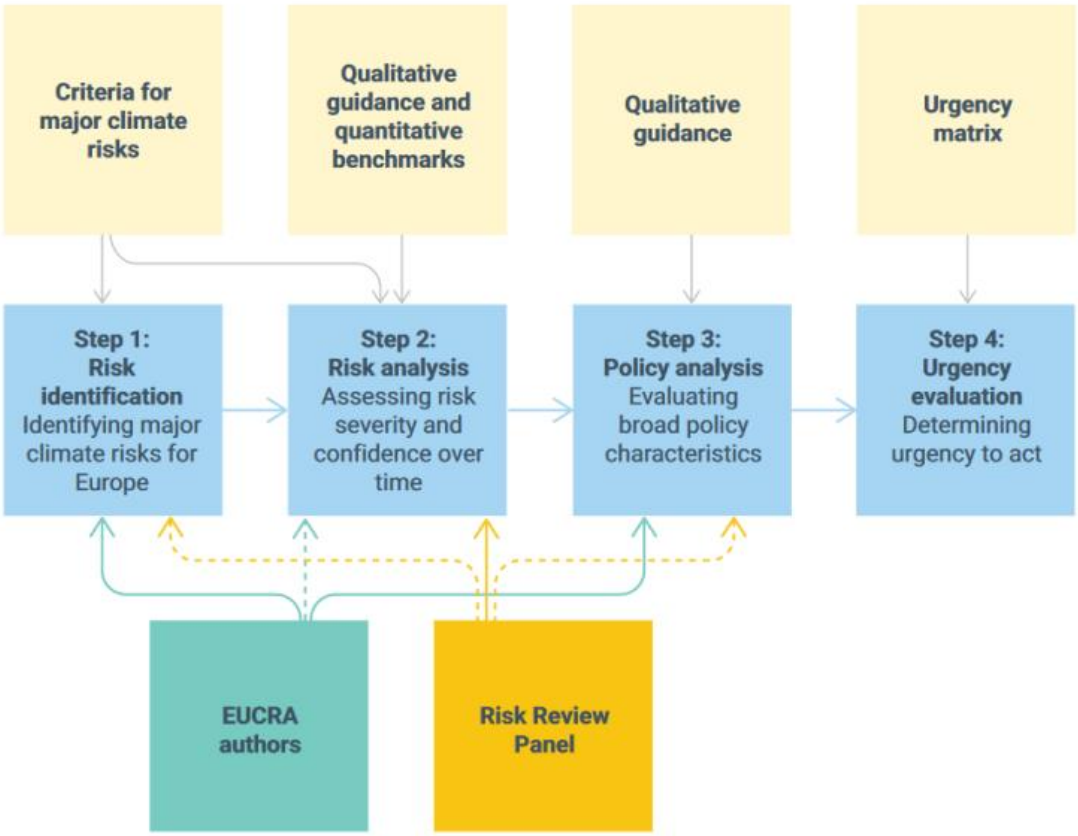
- the IPCC's Sixth Assessment Report (AR6),
- publications from research projects funded under Horizon 2020 and Horizon Europe,
- other relevant academic publications, reports and knowledge sources produced by EU institutions, including the overview of natural and man-made disaster risks the EU may face, and the series of PESETA (Projection of Economic impacts of climate change in sectors of the EU, based on bottom-up analysis) projects undertaken by the JRC,
- other products developed and managed by the EEA such as the Climate Adaptation Platform (Climate-ADAPT) and the briefing and technical report 'Is Europe on track towards climate resilience?'.

In line with the IPCC AR6 definition, the EUCRA report understands climate risk as the potential for adverse consequences for human or ecological systems. Two factors influence the severity of climate risks, namely (1) climatic hazards and (2) non-climatic risk drivers (i.e. environmental stressors, technical factors, socio-economic factors, policy aspects). Generally, the risk assessment approach in the EUCRA report followed the International Organisation for Standardisation (ISO) 31000 standard on risk management and ISO 14091 standard on adaptation to climate change, with its phases of risk identification, risk analysis and risk evaluation.

Figure 40 shows the methodological framework that facilitated the structured risk assessment carried out in the EUCRA report. A consecutive four-step assessment process was conducted, involving a broad range of experts (the EEA, the European Topic Centre on Climate Change Adaptation, the JRC, the Copernicus Climate Change Service (C3S)), stakeholders representing the political level (Steering Group, Commission Working Group) and a community of practice (Expert Advisory Group, Risk Review Panel, the European Environment Information and Observation Network)).

The report identified 36 major climate risks for Europe and presented complex climate risks using risk storylines. It assessed the severity of those major climate risks for several time horizons, as well as the associated confidence. It also included a policy analysis describing to what extent climate risk is being recognised and managed in Europe. Eventually, for each identified risk its urgency for EU action was evaluated in a structured way based on the outcomes of the risk and policy evaluation, while risk ownership was also assessed at EU and MS level, without going beyond subnational, sectoral or transboundary levels.

Figure 40: Methodological framework for EU climate risk assessment



Source: EUCRA based on EEA information.

4.3.4 Uncertainties and challenges

According to the EUCRA-1 report, climate uncertainty refers to incomplete knowledge of future climate and related non-climatic conditions. It is a challenge for decision-making and adaptation planning because waiting for uncertainties to be resolved may leave little or no time for effective action. To assess risk, it is fundamental to consider how the key driving factors determining potential impacts will evolve in the future.

In this case, specific projections were presented using fixed periods in the future, which is relevant for understanding the rate of climate change and its impacts and hence the urgency to adapt to climate change. Future changes were discussed for three periods: current/near-term (2021-2040), mid-term (2041-2060) and long-term (2081-2100). Using fixed periods, it was easier to identify the role of key risk drivers to look at, based on rates of historical developments and the range of future trends. Special attention was paid to the mid-term future, as this is the timeframe for guiding many adaptation policies to reduce risks associated with climate change.

All projections are conditional on assumptions made about future human behaviour and decisions (e.g. concerning GHG emissions mitigation, technological developments and international relations), so it is important to capture some of these overarching assumptions in the assessment. This can be done using scenarios. A scenario can be defined as ‘a plausible description of how the future may develop based on a coherent

and internally consistent set of assumptions about key driving forces and relationships' (IPCC, 2022a). Scenario uncertainties grow as one proceeds into the long-term future. This process should account for the need to enable both a scenario-robust assessment of future uncertainties and clear communication and policy embedding of the scientific findings.

4.4 Adaptation priorities and barriers

4.4.1 Adaptation priorities

Each of the 36 major climate risks identified in the EUCRA-1 report can cause significant environmental degradation, economic damage, social emergencies and political turbulence. Combined, their impacts are even more damaging. To follow up on the EU Adaptation Strategy, the report proposes priorities for action in Europe. These priorities were identified in the four-step assessment process introduced in Section 4.3.3 (see also Figure 40), which relied on an extensive expert consultation. This process is briefly described below.

- The first step consisted of identifying major risks for a broad range of themes (e.g. marine and coastal ecosystems) or developing risk storylines (e.g. risks of disruption to supply chains). This was mostly done by the teams of authors of the EUCRA-1 factsheets and storylines. A risk review panel, consisting of external senior expert in risk assessments with a cross-disciplinary background, provided limited input and focused on reframing selected risks and merging overlapping risks from different factsheets and storylines.
- The second step consisted of prioritising climate impact chains in Europe. This involved doing a structured and semi-quantitative assessment of risk severity and associated confidence, for three different time periods: current (up to 2040), mid-century (2041-2060), late century (2081-2100). An initial risk analysis was conducted by the teams of authors of the EUCRA-1 factsheets and storylines for the risks in their chapters.
- The third step consisted of an indicative policy analysis, starting with identifying relevant policies and assessing the policy horizon in line with the periods used for the risk analysis, followed by an assessment of the readiness of those policies (low, medium, advanced, very advanced). This step was informed by consultations of a dedicated working group made up of experts from across many Directorates-General of the European Commission.
- The final step consisted of an evaluation of risk urgency, based on a risk urgency matrix that considers risk severity and confidence (for a given period and warming scenario), as well as policy readiness, and resulting in five urgency levels: 'urgent action needed', 'more action needed', 'further investigation', 'sustain current action' and 'watching brief'. The urgency to act for major risks identified in EUCRA constitutes the core result of the structured risk assessment process.

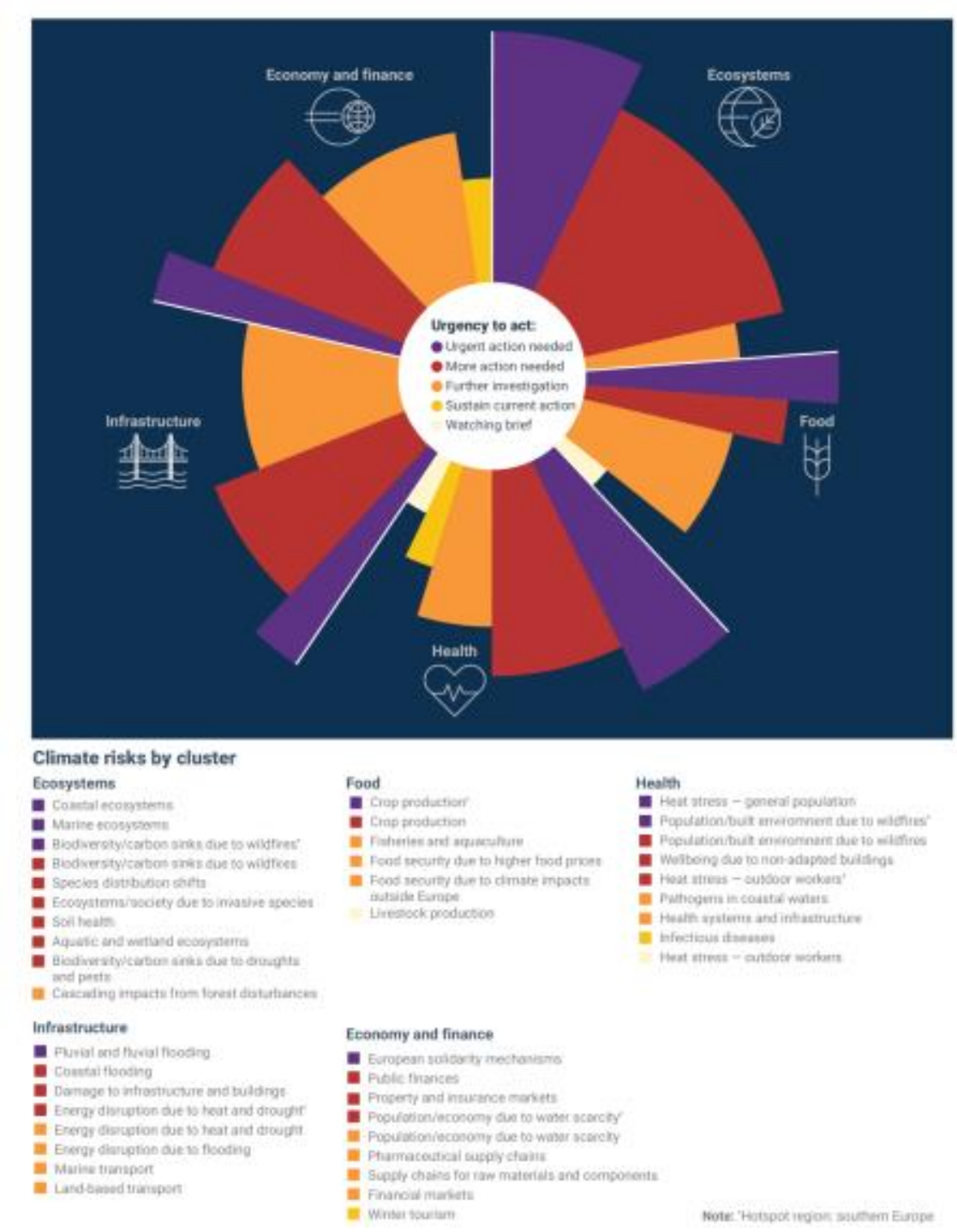
The priorities for action, resulting from the consideration of risk severity, confidence and policy readiness, were then presented for five thematic clusters, as shown in

A distinction was made between major risks assessed as ‘urgent action needed’ and ‘more action needed’, which were assigned priorities for policy action, while those assessed as needing ‘further investigation’ were assigned priorities for knowledge action.

A non-comprehensive assessment of risk ownership was also conducted to describe where the lead responsibility to manage a major climate risk lies at EU level and at national level, or if it is co-owned. This indicative analysis was conducted mainly by the teams of authors, assisted by EUCRA-1 policy chapter experts.

An important conclusion of the assessment of adaptation priorities was that more attention should be paid to the cross-sectoral characteristics of the identified major climate risks for Europe. Similarly, the risk ownership assessment showed that most climate risks are co-owned by the EU and EU Member States, with a huge amount of evidence of transboundary risks, requiring decisive and coordinated policy responses at both EU and national levels.

Figure 41: Major climate risks for Europe and the urgency to act on them (EUCRA)



The ongoing EUCRA-2 process offers an excellent opportunity to refine and improve the European climate risk assessment framework by delivering more targeted policy-relevant suggestions. The European Environment Agency has published in October 2026 the methodology paper on EUCRA-2, which will be designed around users' needs and developed collaboratively with stakeholders, drawing on leading practices and existing climate-risk knowledge. It takes a holistic, solution-oriented and policy-relevant approach that considers interconnected risks and identifies practical adaptation barriers, enabling conditions and policy levers.

EUCRA-2 plans the following key improvements aiming to go beyond a traditional climate risk assessment: Adopting a more effective structure to increase the usability of results for policymakers and provide clear, recommendations that can be acted upon;

- Improving the information basis, improving the traceability of the assessment and including risks from outside Europe, tail risks and high impact-low probability events or outcomes;
- Expanding risk and policy coverage to address EU current needs and emerging challenges and enhanced assessment of policy readiness;
- Integrating focus on 'solution space', including a structure analysis of adaptation options, with a focus on real-world delivery and implementing enabling conditions;
- Expanding stakeholder involvement, learning from latest national climate risk assessments and a structured involvement of sectoral stakeholders.

4.4.2 Adaptation challenges and barriers

Despite progress in developing national climate adaptation strategies and plans, a significant gap remains between adaptation strategies, planning and effective implementation across the EU[44]. Recent assessments of the European Scientific Advisory Board on Climate Change and the EEA, and the European Court of Auditors' audit report indicate that the main EU adaptation gaps lie not in the lack of policy frameworks, but rather in their translation into effective and measurable risk reduction.

Persistent challenges concern implementation capacity, estimation and tracking of adaptation finance, policy coherence across governance levels and sectors, the use of updated climate risk information, and monitoring and evaluation of adaptation outcomes. The European Court of Auditor's finding that many of the projects examined had little or no impact on adaptive capacity, with some presenting a potential risk of maladaptation, further underlines the need to shift attention from adaptation planning and expenditure to demonstrating effectiveness and resilience outcomes[45].

Climate risk assessment and use of climate information

The availability and effective use of climate risk information remain uneven. Although national adaptation frameworks examined by the European Court of Auditors were supported by climate risk assessments and generally aligned with the EU Adaptation Strategy, the audit identified instances where EU Member States relied on outdated scientific information.

The European Court of Auditors also found inconsistencies between regional or sectoral priorities and national or EU adaptation objectives, especially in agriculture and forestry.

[44] 2025 assessment of progress and challenges, https://www.eea.europa.eu/en/analysis/publications/climate-resilience-in-europe-2025-progress-and-challenges.

[45] 2025 assessment of progress and challenges, https://www.eea.europa.eu/en/analysis/publications/climate-resilience-in-europe-2025-progress-and-challenges.

Governance and policy coherence

Effective adaptation requires consistency between the EU, national, regional and sectoral objectives. The European Court of Auditors found national frameworks to be overall consistent with the EU Adaptation Strategy. However, it identified cases where regional and sectoral plans addressed priorities which could conflict with higher-level adaptation objectives[46].

Implementation and effectiveness gap

Despite the existence of climate adaptation frameworks at EU and Member State levels, evidence points to a continuing gap between policy ambition and effective implementation. The audit report concluded that, while the overall EU adaptation framework was sound, weaknesses and gaps emerged when it was put into practice. It found that out of 36 adaptation projects, only 19 addressed climate risks effectively, while 13 had little or no impact on adaptive capacity and two could result in maladaptation.

These findings show that implementation cannot be assessed only in terms of expenditure or the number of measures undertaken; there needs to be more of a focus on effectively reducing vulnerability and climate risk.

Climate financing and assessment of adaptation costs

The adaptation finance gap concerns not only the availability of resources but also the capacity to estimate needs and track expenditure and results. The European Court of Auditors found that all EU Member States included in its audit sample had underestimated adaptation costs in their strategies or plans or omitted them completely. The EEA assessment identified insufficient long-term financing, difficulties accessing funding and limited information on adaptation costs as persistent barriers to implementation.

Monitoring, reporting and evaluation

Monitoring and evaluation remain major weaknesses in assessing adaptation progress. The European Court of Auditors found that EU Member States' reporting was largely descriptive and lacked quantitative information, making it insufficient for evaluating progress. It also pointed out the absence of common indicators for measuring progress towards the EU's vision of climate resilience by 2050. This is in line with the EEA's findings that monitoring is more developed than evaluation, therefore not demonstrating outcomes. The importance of strengthening the evidence base for adaptation through better climate-related risk and losses data, improved observation systems and continued scientific support. Relevant EU action includes the objective of making Climate-ADAPT the authoritative European platform for adaptation and broader support for climate observation through Copernicus and related research infrastructures.

[46] European Court of Auditors (2024), Climate adaptation in the EU – Action not keeping up with ambition, Special Report 15/2024. Paragraphs 77-80, European Court of Auditors report on climate adaptation.

Awareness and local level capacity

The European Court of Auditors' assessment also brought to light the importance of translating national adaptation policy into local awareness and actions.

4.5 Adaptation strategies and policies

The European Climate Law provides the foundation for increased ambition and policy coherence in terms of adaptation. It requires the EU and EU Member States to continuously improve adaptive capacity, strengthen resilience and reduce vulnerability to climate change, while ensuring coherence across policies and sectors. The Law calls for national adaptation strategies and plans to be based on the best available science, informed by climate risk and vulnerability analysis, and consistent with the precautionary principle. It also underpins the regular monitoring of progress and supports the integration of adaptation into relevant EU legislation, strategies and investment decisions, in line with the EU Adaptation Strategy.

The EU Adaptation Strategy was adopted in March 2021. It sets out the vision for the EU to become a climate-resilient society that is fully adapted to the unavoidable impacts of climate change by 2050, thanks to the achievement of four high-level objectives: making adaptation smarter, making adaptation faster, more systemic, and stepping up international action. The strategy outlines 49 actions at EU level, to which the European Commission has committed itself, to deliver against the four objectives across a broader spectrum of policy areas and aligned with different time horizons.

Objective 1: Smarter adaptation: improving knowledge and managing uncertainty	
The 2021 EU Adaptation Strategy champions the need for robust data and risk assessments to inform all sectors of society on the current and future impacts of climate change. The objective acknowledges and targets knowledge gaps and uncertainties that persist in the understanding of the effects of climate change on natural and human systems, and it aims to push these frontiers, including by acquiring more and better climate-related data. It also recognises society's increasing demand for user-friendly tools that condense complex climate information into knowledge that can be acted upon.	
Field of actions planned	Pushing the frontiers of knowledge on adaptation More and better climate-related risk and losses data Making Climate-ADAPT the authoritative European platform for adaptation
Objective 2: More systemic adaptation: Support policy development at all levels and in all sectors	
This objective acknowledges that climate change affects all levels of society and all sectors and reflects the need for a correspondingly systemic response. This objective emphasises mainstreaming climate resilience considerations in all policy areas, going beyond the sectors that traditionally receive the most attention in adaptation, such as agriculture and infrastructure. Encompassing 4 areas and 15 actions, it highlights	

three cross-cutting priorities: integrating climate change adaptation into macro-fiscal policy, supporting nature-based solutions, and bolstering local adaptation action.	
Field of actions planned	Improving adaptation strategies and plans Supporting local, individual and just resilience Integrating climate resilience into national fiscal frameworks Promoting nature-based adaptation solutions
Objective 3: Faster adaptation: Speeding up adaptation across the board	
Climate change has been outpacing progress in implementing climate adaptation measures. To accelerate the implementation of adaptation measures, resources commensurate with the challenge are required. Under the objective of faster adaptation 17 actions are presented, spread over four challenges: to develop and roll out solutions, to help reduce climate risk, to increase climate protection, and to safeguard freshwater access. Reported adaptation measures increasingly show a gradual shift from institutional and governance actions towards more concrete physical, technological and nature-based responses. This helps demonstrate that, while institutional foundations remain important, Member States are also starting to put in place more tangible adaptation actions.	
Field of actions planned	Accelerating the roll-out of adaptation solutions Reducing climate-related risk Closing the climate protection gap Ensuring the availability and sustainability of freshwater
Objective 4: Stepping up international action for climate resilience	
This objective expands the scope of the EU Adaptation Strategy and action to a global level. Closer international cooperation to achieve climate resilience is encouraged in the Strategy in three policy areas and 10 actions. Alignment with the adaptation-related requirements and objectives of the Paris Agreement is an important element. The Strategy further develops the EU's role in supporting international adaptation, alongside its global leadership in climate change mitigation. It underscores the need for a collaborative, unified response, particularly targeting regions vulnerable to climate impacts. Encapsulating the spirit of global solidarity, the objective outlines the urgent need for additional international finance and innovation in financial mechanisms to support climate resilience worldwide. The EU will promote subnational, national and regional approaches to adaptation, focusing on adaptation in Africa, small island developing states (SIDS) and least developed countries (LDCs). The EU will implement the Green Agenda for the Western Balkans and strong partnerships in its neighbourhood, in particular in the Mediterranean[47].	
Field of actions planned	Increasing support for international climate resilience and preparedness Scaling up international finance to build climate resilience

[47] The Mediterranean is a climate change hotspot, exposed to a combination of hazards overlapping with a specific set of vulnerabilities. This shows the importance of supporting adaptation efforts in the Southern Neighbourhood.

	Strengthening global engagement and exchanges on adaptation

The EU Framework for Climate Resilience

In To strengthen long-term climate resilience, the Commission recently presented the EU Framework for Climate Resilience. The package includes a proposal for a regulation, a communication and digital tools. It calls for a systemic change to strengthen Europe's ability to anticipate, prepare for, and manage climate risks and to embed climate resilience across all major policy areas.

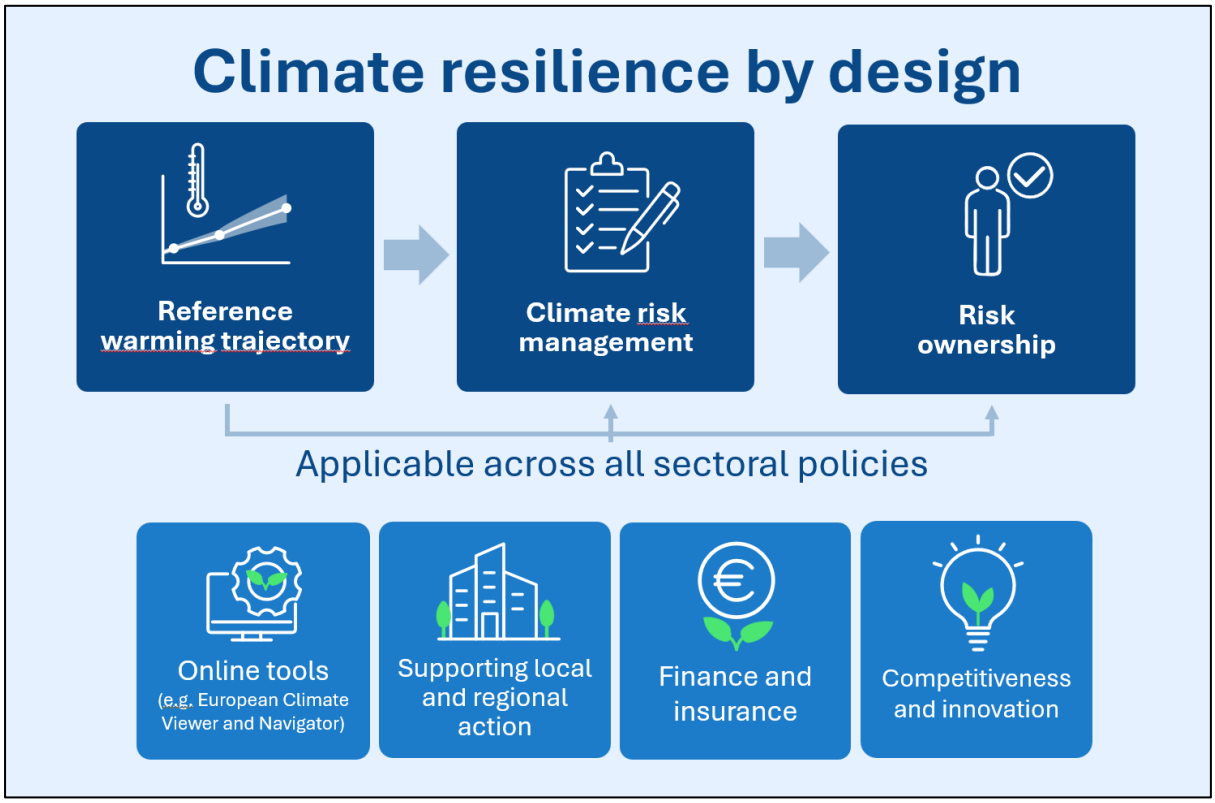
The proposed **European Climate Resilience Law** is designed to ensure that the EU and Member States act together and manage their climate risks in concert. It aims at making policies and action significantly more impactful, through the following elements:

- **Application of a reference global warming trajectory.** Current evidence shows that the world is on a path to warm above pre-industrial levels by 1.5 °C by 2030, 2 °C by 2050, and 3 °C by 2100. When making decisions about policies, assets and investments, the reference global warming trajectory will need to become the baseline assumption for the Union and national action, feeding into more robust risk assessments and tolerance determining choices to be made.
- **Identification of policy risk owners.** Governments need to be clear and transparent about which actor is responsible for management of climate risks in all policy areas and across all levels of governance.
- **Improved and more regular climate risk assessments** to promote that Member States' assessments and the European Climate Risk Assessment become comparable and more synchronised in timing and content.
- **Encouragement to take into account** the reference global warming trajectory, national climate risk assessments, and other relevant risk assessments when public authorities carry out their functions, in particular budgeting, spatial planning and impact assessments**.**
- **A single strategic plan for climate resilience by Member States.** Member States will prepare one national strategic plan for climate resilience, bringing together the key elements of climate resilience planning. At EU level, a strategic plan for climate resilience will provide an action-oriented successor to the current EU Adaptation Strategy.
- **Simpler and more effective monitoring and progress tracking** to assess the outcome of climate resilience actions and help improving them.

The framework also provides public authorities, businesses and communities with **practical tools** to better understand and manage climate risks. The **European Climate Viewer** shows current and possible future climate conditions using Copernicus climate data and projections. The **Navigator of Climate Resilience Tools** helps users find relevant tools based on their location, sector and climate risks. The **Solutions Explorer**

presents practical adaptation solutions developed and tested through the EU Mission on Adaptation to Climate Change.

Figure 42 The EU Framework for Climate Resilience – overview



Source: COM (2026) 720.

Climate change can unleash cascading risks and exacerbate environmental degradation and existing drivers of conflict, displacement and migration. It is therefore important to mainstream adaptation considerations in non-climate policy frameworks such as the Common Agricultural Policy, the European security strategy, the EU mobility strategy and others. Reflecting its greater prominence on the overall EU's political agenda, recent cross-cutting policy frameworks such as the EU Preparedness Union Strategy and the Competitiveness Compass also feature adaptation considerations. The EU Preparedness Union Strategy is a comprehensive plan to enhance the EU's preparedness and readiness for future crises. It intends to strengthen coordination and efficiency in existing EU-wide and national strategies, and to support a culture of resilience to all hazards, including climate hazards, by getting all levels of society involved. As for the Competitiveness Compass, this roadmap meant to restore Europe's dynamism and boost its economic growth also asks the EU and EU Member States to regularly update climate risk assessments and improve critical infrastructure by taking the results of the assessments into account. Both policy documents mention the concept of 'preparedness by design', while the EU Preparedness Union Strategy explicitly sets out to embed the concept across EU legislation, policies and programmes.

In March 2026, the EU also adopted a Communication on Integrated Wildfire Risk Management. The Communication addresses the whole disaster risk management cycle – prevention, preparedness, response and recovery. It proposes measures that the European Commission and EU Member States could take to strengthen wildfire risk governance, land and landscape management, research and innovation, response operations, population awareness and preparedness, and recovery. In June 2026, the Council adopted a Recommendation on integrated wildfire risk management to strengthen preparedness and enhance prevention.

Frameworks for assessing the macro-fiscal - implications of adaptation efforts

Embedding climate considerations in fiscal policy is key to making national budgets more resilient to climate impacts. As the economic and fiscal costs of climate change mitigation and adaptation are rising, and mitigation and adaptation efforts accelerate and come with significant macro-fiscal implications, it is essential, for assessing the macro-fiscal impacts of climate change and climate policies, to integrate them into national budgetary frameworks.

Significant progress in framing such steps was made in 2024, with amendments to the directive on requirements for budgetary frameworks of the Member States, adopted as part of the revised EU Economic Governance Framework. From 2026, all EU Member States are required to assess and report in their budget documents, to the extent possible, on how climate-related macro-fiscal risks may affect the medium- and long-term sustainability of public finances – covering both the macro-fiscal implications of climate change and of adaptation and mitigation efforts – and on disaster- and climate-related contingent liabilities and the fiscal costs incurred due to disasters and climate-related shocks. These provisions aim to strengthen the understanding and management of climate-related fiscal pressures, inform policy and investment decisions, and strengthen fiscal sustainability.

The European Commission is actively supporting EU Member States in translating EU requirements into national practices. The Commission has published a report to support EU Member States in fulfilling the Directive's requirements, outlining possible methodological approaches and gradual frameworks for conducting assessments. It also coordinates an Expert Group on Climate and Disaster Fiscal Risks, bringing together representatives from EU Ministries of Finance and civil protection authorities, which aims to support exchanges of best practice and peer learning in that area. A multi-country Technical Support Instrument project involving 18 Member States[48] is also scheduled to begin in autumn 2026, to strengthen participating EU Member States' capacities to do climate-related macro-fiscal analysis, and to support the fulfilment of the Directive's requirements.

[48] Austria, Belgium, Cyprus, Denmark, Germany, Estonia, Greece, Spain, Finland, France, Italy, Latvia, Malta, the Netherlands, Portugal, Sweden, Slovenia and Slovakia.

4.6 Progress on implementation on adaptation

4.6.1 Adaptation in the EU and in EU Member States

EU level

The 2021 EU Adaptation Strategy is the basis for implementing adaptation in the EU. Its implementation and progress revolve around 49 actions and 4 central objectives.

Member State Level

Under the Governance Regulation (see Section 4.7 Monitoring and evaluation), EU Member States report to the European Commission every two years on their national climate change adaptation planning and strategies, covering both implemented and planned adaptation actions. Under Annex I to Commission Implementing Regulation (EU) 2020/1208, EU Member States report information on: national circumstances, impacts, vulnerabilities, risks and adaptive capacity; legal and policy frameworks and institutional arrangements; adaptation strategies, policies, plans and goals; monitoring and evaluation of adaptation actions and processes; cooperation, good practices, synergies, experience and lessons learnt in the field of adaptation; and any other information on climate change impacts and adaptation.

It is to note that the Commission's 2023 assessment of draft updated NECPs found a mismatch between NECPs and Member States' planned and implemented adaptation policies and measures, which underlines the need for better integration of adaptation into planning and investment frameworks.

Progress on adaptation to climate change has been uneven across EU Member States[49]. In general, EU Member States are making progress in developing their climate risk assessments (CRAs). **National climate risk assessments** are becoming more common, but they differ in scope, methodology and timeliness. This makes it difficult to develop a consistent understanding of climate risks across Europe. 21 Member States have published at least one comprehensive national climate risk assessment. Between 2023 and 2025, six EU Member States completed new or updated CRAs with country-wide coverage, addressing multiple hazards and risks across sectors, while 11 produced new thematic or sectoral assessments[50].

Gaps in data, institutional capacity and funding limit the quality and comparability of assessments. Compound and cascading risks, where impacts spread across sectors and systems, are not assessed consistently. This affects how climate risks are identified and reflected in policies, leading to uneven levels of awareness, preparedness and action.

Transboundary risks are not sufficiently addressed. Close cooperation across borders is not a rule. Data sharing and exchanges of good practices remain limited. The Union

[49] https://www.eea.europa.eu/en/analysis/publications/climate-resilience-in-europe-2025-progress-and-challenges

[50] https://www.eea.europa.eu/en/analysis/publications/climate-resilience-in-europe-2025-progress-and-challenges

and Member States do therefore not have a comprehensive picture of shared climate risks and how best manage them.

Available reporting provides only a partial view of the Union's and Member States preparedness. It focuses mainly on planning and governance aspects, with less attention to concrete actions and results. All EU Member States have adopted national climate adaptation policies; most have completed at least one full policy cycle and 14 address climate adaptation in national climate laws. Nevertheless, countries face difficulties in turning climate risk assessments into targeted action. The reasons for these difficulties include unclear division of responsibilities, limited institutional capacity, uncertain financing and complex coordination across sectors and levels of government.

Regional and local authorities often lack staff, skills and resources needed to translate national priorities into action. This contributes to differences in preparedness between regions. EU initiatives such as the Covenant of Mayors and the EU Mission on Adaptation to Climate Change, together with national programmes, help strengthening regional and local action.

Funding is a major constraint. Adaptation measures often depend on short-term national funding, with only limited examples of dedicated budgets, cost-benefit evidence and private investment.

Monitoring, evaluation and learning systems require improvements. This makes it difficult to assess whether measures are effective and whether the Union and Member States are becoming more resilient. Objectives and indicators vary widely, and links between them are often weak**.** Stronger, outcome-based indicators are needed to better track progress and assess climate resilience progress across the Union.

Progress can be noted at EU level thanks to the implementation of the EU Adaptation Strategy. However, available information suggests that progress in terms of the implementation of adaptation actions remains uneven[51], and that more needs to be done by EU Member States in terms of governance aspects, awareness raising, fairness and just resilience, financing, and developing nature-based solutions (see Section 4.4.2 Adaptation challenges and barriers).

The EU supports efforts to strengthen climate resilience beyond Europe. It provides dedicated finance and promotes international cooperation and exchange on adaptation.

Examples include several Team Europe initiatives. In Africa, the EU supports vulnerable populations in dealing with climate and natural hazard risks. Other initiatives address water, energy and climate change in Central Asia and the protection of tropical forests in the Amazon Basin. The EU also participates in international initiatives such as the

[51] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52024DC0091

Africa Adaptation Initiative, the International Coral Reef Initiative and the All-Atlantic Ocean Research and Innovation Alliance.

The EU also supports partner countries in developing policies and incentives for climate-resilient investment, including nature-based solutions. Through international cooperation and initiatives such as the High Ambition Coalition and the Leaders' Pledge for Nature, it promotes approaches that deliver benefits for both climate and biodiversity and feature strong sustainability safeguards.

Disaster preparedness is supported through the EU Disaster Preparedness Budget Line in the humanitarian aid framework. It provided EUR 77.7 million in 2023 and EUR 78.3 million in 2024 for preparedness measures in high-risk and climate-vulnerable regions. Support includes early warning systems, risk assessments, anticipatory action, contingency planning and strengthening local response capacity. Particular attention is paid to fragile and conflict-affected settings, climate and environmental resilience, and preparedness in urban areas.

These activities contribute to the thematic targets of the UAE Framework for Global Climate Resilience set out in paragraph 9 of the relevant decision. They also support the adaptation cycle described in paragraph 10, covering risk assessment, planning, implementation, and monitoring, evaluation and learning.

Detailed information on financial, technological and capacity-building support provided to developing countries can be found in Chapter 5 (Support provided and mobilised).

4.7 Monitoring and evaluation

Currently, monitoring under the Governance Regulation relies substantially on EU Member States' Article 19 reporting on their national adaptation actions and progress. Recent findings reported in Section 4.4.2 concluded that there were coherence gaps in EU monitoring and evaluation, when assessing the effectiveness and efficiency of adaptation measures across all EU Member States.

The recent EEA briefing from 2025, 'From adaptation planning to action: Insights into progress and challenges across Europe' and its report from 2026, 'Climate resilience in Europe, 2025 – progress and challenges', provide analysis of the information reported by EU Member States. All information reported is published on Climate-ADAPT, under the country profiles, and adaptation-relevant information on EU Member States' progress in reaching the adaptation goals in their national energy and climate plans (NECPs) is available on the Climate and Energy in the EU portal.

Article 17 of the Governance Regulation requires EU Member States to report on the status their NECPs on how they are contributing to the achievement of the goals of the Energy Union and the Paris Agreement (see also Section 3.1.2). In 2023-2024, EU Member States submitted draft and final updated NECPs, and the European Commission assessed the information in them, including national adaptation goals. The

results of this assessment are available as an EU-wide report and individually for each EU Member State.

The Governance Regulation and the European Climate Law provide the basis for a system allowing monitoring, evaluation and learning (MEL). The experience it has helped gather offers useful insights into how qualitative and quantitative information can be synthesised while respecting national circumstances. This system demonstrates how structured reporting cycles, combined with transparent data platforms and the conduction of synthesis assessments that often end up being published together with recommendations where applicable, can support consistent aggregation without imposing uniformity on national approaches.

The results of the 2023-2025 reporting cycle under the Governance Regulation indicate that developments in MEL systems are underway in most EU Member States. National monitoring and reporting activities are currently more widespread than evaluation activities, but the latter are planned or forthcoming in 12 EU Member States, suggesting that experience with policy evaluation will increase in the coming years (Climate resilience in Europe, 2025).

EU Member States are progressing at different paces with their MEL systems. Some already report having comprehensive MEL systems or having recently strengthened existing ones through new assessments, while others are building up their systems step by step, by linking MEL elements to climate risk assessments and adaptation projects, or preparing dedicated systems in conjunction with forthcoming national adaptation strategies and plans. EU Member States also draw on a mix of methodological approaches, combining indicator-based monitoring with qualitative tools such as stakeholder workshops and self-assessment surveys, and several have developed sector-specific indicator frameworks covering areas such as water management, agriculture, forestry and early warning systems. Institutional responsibility for coordinating MEL typically lies with ministries for environment, climate or regional development, or with dedicated cross-sectoral bodies, reflecting the diverse governance traditions across the EU.

This diversity of approaches shows the depth of national engagement with MEL but also means that experience and good practice are not yet easily comparable or transferable across borders, which can limit how quickly proven approaches can be scaled up at EU level. Progress remains difficult to measure consistently across EU Member States. This calls for strengthened governance to ensure more coherent policy and monitoring, reporting and evaluation frameworks at all levels. Strengthening the links between climate risks, adaptation responses and their outcomes will be crucial for consolidating the evidence base for future revisions of climate risk assessments and adaptation strategies.

These findings from the last reporting cycle confirm the conclusions of the European Court of Auditors published in 2024, which recommended that ‘the [European] Commission should: (a) strengthen the requirement for reporting on adaptation to

include common indicators and criteria for measuring progress; (b) work with the [EU] Member States to address weaknesses identified in their reporting on climate adaptation.'

In Climate Resilience in Europe, 2025, the EEA has presented a new assessment framework (the 3Rs) to respond to the above challenge and increasing the emphasis on tracking adaptation progress in terms of risks, responses and results. This reflects the need to understand not only what risks exists, but also how societies respond and the enabling conditions that we improve the outcomes.

The EU framework also links to the thematic targets of the UAE framework and focuses on enhancing the socioeconomic and environmental resilience through: reduced risks, reduced adverse climate change impacts, avoid economic losses and enhancing co-benefits and synergies.

4.8 Information on averting, minimising and addressing loss and damage associated with climate change impacts

2025 was marked by a range of extreme weather events in the EU, from widespread drought in spring and summer to heatwaves from the Mediterranean to the Arctic Circle, wildfires in southern Europe and storms across the continent. Significant heatwaves affected large parts of western and southern Europe. For 2025 as a whole, much of northern Europe experienced record warmth, including its most severe heatwave on record. Large wildfires occurred in southern France, Spain, Portugal, Cyprus and Greece.

Storms and flooding affected parts of Europe, but overall extreme precipitation and flooding were less widespread than in recent years.

Such climate-related hazards pose risks to human health, the environment, food production and supply, and infrastructure, and can lead to economic losses.

As mentioned above, the 2021 EU Adaptation Strategy is the cornerstone for scaling up ambitious EU domestic and international actions and measures for making adaptation actions smarter, more systemic, faster and global, and for building resilience and preparedness.

Ample information on impacts, risks and vulnerabilities and the EU's institutional arrangements for implementing the EU Adaptation Strategy is provided above (see Sections 4.4.1, 4.4.2 and 4.6).

This section will focus on a sample of the measures and instruments the EU has put in place to avert, minimise and address the adverse effects of climate change-related loss and damage.

The EU has several initiatives, programmes, sectoral pieces of legislation, strategies and projects in place to help avert, minimise and address loss and damage. These range

from early warning systems to helping communities, livelihoods and ecosystems be resilient.

Table 18: Examples of EU initiatives to help avert, minimise and address loss and damage

Loss and damage areas of cooperation and facilitation based on Paris Agreement Article 8	Type of initiatives/Policy areas	Initiatives
Early warning systems	European Early Warning and Information Systems[52]	Global disaster alert and coordination system The European flood awareness system and global flood awareness system The European forest fire information system and global wildfire information system The European and global drought observatories Galileo Emergency Warning Satellite Service
	Earth observation Research and knowledge sharing	Copernicus climate change service[53] Copernicus Data Space Ecosystem[54] and WEkEO[55] PESETA report[56]
Example: Galileo Emergency Warning Satellite Service (EWSS): a system of 30 Galileo satellites and ground stations provide geographic positioning information. Through Galileo EWSS as of 2026, EU Member States will be able to broadcast alert messages to populations, when local civil protection authorities consider it necessary to do so. MeteoAlarm[57], an early warning dissemination system that visualises, aggregates and provides accessible awareness information from 38 European national meteorological and hydrological services.		

[52] European Early Warning and Information Systems - European Civil Protection and Humanitarian Aid Operations

[53] Copernicus Climate Change Service, https://climate.copernicus.eu/.

[54] Copernicus Data Space Ecosystem, https://dataspace.copernicus.eu/.

[55] Ibid.

[56] JRC Peseta iv, https://joint-research-centre.ec.europa.eu/scientific-activities-z/peseta-climate-change-projects/jrc-peseta-iv_en.

[57] MeteoAlarm, https://www.meteoalarm.org/en/live/page/about-meteoalarm#list.

Emergency preparedness	Civil protection[58] and disaster management	-the EU Civil Protection Mechanism (UCPM); -the Emergency Response Coordination Centre (ERCC); -the European Civil Protection Pool; -the Disaster Risk Management Knowledge Centre[59]
Example: The 2025 wildfire season[60]: In 2025 (January to August) there was a greater than usual number of fires and burnt areas. Besides the fire activity in Portugal, Spain and France, there were also numerous fires in the Balkan region, Ukraine, Romania and Ireland. The overall situation in the EU shows that burnt areas and the number of fires in 2025 were well above the average (2006-2024). There were **16 wildfire events** in Europe during which the ERCC coordinated a rapid response following a request for assistance through the UCPM. There were also two wildfire events outside Europe during which the ERCC coordinated a rapid response following a request for assistance via the UCPM.		
Slow onset events	Nature and biodiversity *"L'Instrument Financier pour l'Environnement"* (Financial Instrument for the Environment) LIFE Programme	EU Nature Restoration Regulation and the Marine Action Plan Birds and Habitats Directives Natura 2000 2030 Biodiversity Strategy
Example: The EU Nature Restoration Regulation introduces legally binding targets to restore at least 20% of the EU's land and sea areas by 2030, and all degraded ecosystems by 2050. These targets cover a wide range of habitats, including wetlands, forests, grasslands, rivers, lakes and marine areas, supporting both Europe's biodiversity recovery and climate adaptation. EUCRA1 identifies major climate risks to biodiversity, helping policymakers refine and prioritise biodiversity protection and restoration actions under the 2030 Biodiversity Strategy, according to where risks are most severe.		
Events that may involve irreversible and permanent loss or damage	EU regional policy European Civil Protection and Humanitarian Aid Operations	EU Solidarity Fund[61] RescEU[62]
Example: The EU's response to natural disasters that may involve irreversible and permanent loss or damage often includes financial aid, operational support and long-term recovery planning. This can include activating and deploying responders under the **European Union Civil Protection Mechanism (UCPM),** using the **Copernicus Emergency Rapid Mapping Service** for post-event assessments, as well as financial support from the **EU Solidarity Fund or cohesion policy** re-allocations.		

[58] EU Civil Protection Mechanism – European Commission

[59] EU disaster management centre

[60] The 2025 Wildfires Season

[61] Info Regio – EU Solidarity Fund

[62] rescEU – European Civil Protection and Humanitarian Aid Operations

Comprehensive risk assessment and management	EU policy framework for climate resilience and preparedness	European Climate Risk Assessment (EUCRA) Commission Communication on managing climate risks EU Framework for Climate Resilience
Example: EUCRA identifies 36 major climate risks with potentially severe consequences across Europe. The risks are evaluated in terms of risk severity, policy horizon (lead time and decision horizon), policy readiness and risk ownership. It further identifies priorities for EU policy action, based on a structured risk assessment united with qualitative aspects, such as considering social justice. These are aligned with the solutions identified in the Commission Communication on managing climate risks.		
Risk insurance facilities, climate risk pooling and other insurance solutions	The European Insurance and Occupational Pensions Authority's Centre of Excellence for catastrophe modelling and data	Catastrophe Data Hub[63] CLIMADA-App
Example: There is currently no EU insurance pooling initiative to address specific climate risks, but **several EU Member States have established or expanded national insurance pools for climate risks.** The CatNat Scheme in France established in 1982 covers floods, droughts, cyclonic winds, mudslides, earthquakes, volcanic eruptions, landslides, avalanches, tidal waves and tsunamis; Spain has a Consortium of insurance (CCS) since 1954, which extends the cover of underwritten policies (such as property, business interruption or personal injury policies) for losses caused by extraordinary hazards, including natural hazard such as floods, windstorm, earthquake, volcanic eruption or wave battering, among other events; in Germany, the Federal Climate Adaptation Act, which entered into force in July 2024, establishes a framework for extreme weather events' adaptation at federal, federal-state and municipal levels; in Italy, the 2024 Budget Law established mandatory natural catastrophe insurance for all registered companies (with the exception of the agricultural sector), including foreign companies permanently established in the country.		
Non-economic losses	Climate and health Cultural heritage	The European Climate and Health Observatory[64] Work Plan for Culture covering the period 2023-2026[65]
Example: Culture for the planet: unleashing the power of culture – the EU Work Plan for Culture 2023-2026 sets cultural heritage's climate resilience as one of its four priorities, with outputs including guidelines and a methodology at European level to facilitate the effective design and implementation of risk and emergency preparedness measures in and by EU Member States and supporting cultural and creative sectors' efforts to adapt to the green transition.		

[63] Catastrophe Data Hub - European Insurance and Occupational Pensions Authority

Resilience of communities, livelihoods and ecosystems	EU Missions in Horizon Europe	EU Mission: Adaptation to Climate Change EU Mission: Restore our Oceans and Waters EU Mission: Climate-Neutral and Smart Cities EU Mission: A Soil Deal for Europe
Example: Regional Pathways to Climate Resilience (REGILIENCE)+ is a flagship initiative of the Mission on Adaptation to Climate Change, designed to bridge the gap between available knowledge and local action. Regions can benefit from 150 proven adaptation solutions, 70+ knowledge products, country-specific training sessions and other support. Under the Mission, **27 national adaptation hubs** are being set up across Europe to deliver practical benefits for regions and municipalities by improving vertical and horizontal policy alignment and enabling better access to knowledge, solutions and support for implementation.		

Moreover, the 2021 EU Adaptation Strategy makes a commitment to '**support and promote partner countries in developing local**, national and regional adaptation and strategies for disaster risk reduction. It will continue working with African initiatives and institutions supporting regional adaptation and disaster risk management. These efforts will capitalise on the 'Team Europe' approach and will pursue integration between adaptation, development and humanitarian aid.' Chapter 5 outlines how the EU is increasing support **for international climate resilience and preparedness.**

4.9 Cooperation and good practices

4.9.1 Sharing information and good practices

The rapid rise in climate risks across Europe requires new ways of cooperating across governance levels to make tangible and measurable progress in reducing the most serious climate risks. Such approaches are informed by experiences with the EU Mission on Adaptation to Climate Change and other relevant EU instruments and policies.

The EU Mission on Adaptation to Climate Change supports a group of pioneering regions and local authorities with tools and innovative solutions to help them become climate-resilient by 2030, so they can serve as examples of best practice for all interested parties. The 2025-2026 Activity Report of the Mission, published in May 2026, reported that over 400 regional and local authorities were now engaged in the Mission's activities and initiatives, with more than 290 of them receiving support through Mission technical assistance across more than half of EU Member States. A total of 333 regional and local authorities from 27 EU Member States have signed the Mission Charter, thereby committing themselves to becoming climate-resilient by 2030 by boosting

[64] About | European Climate and Health Observatory Climate-ADAPT

[65] Council Resolution on the EU Work Plan for Culture 2023-2026, EUR-Lex - 32022G1207(01) - EN - EUR-Lex.

regional and local adaptation efforts to reach their adaptation goals. Additionally, 17 entities from associated countries have also signed the Mission Charter.

The tools developed by the Mission on Adaptation to Climate Change to meet the needs of local and regional authorities include the Regional Adaptation Support Tool (RAST). It has been explicitly designed to help with their climate change adaptation strategies and plans – from development and implementation through to monitoring, evaluating and updates. RAST provides practical guidance in six steps aligned with the key features of the climate adaptation policy cycle. Each step includes an overview and a detailed support section, with practical and actionable guidance supplemented by resources (data providers, examples and tools) from the EU Mission on Adaptation to Climate Change, Climate-ADAPT (see below) and other partners helping local and regional authorities across the EU.

The Mission on Adaptation to Climate Change is also supporting cooperation to help regions and local authorities adapt to climate change. It does so, for example, by sharing stories showcasing the successful implementation of effective climate adaptation solutions across Europe, and by sharing mission case studies, resources and effective ways to get people involved. This demonstrates the power of collaborative action and innovative approaches in addressing climate challenges and creating a more resilient and sustainable future for Europe.

The EU Mission 'Restore our Ocean and Waters by 2030' complements this work for marine and freshwater systems. Through four lighthouses (Atlantic and Arctic, Mediterranean, Baltic and North Sea, and Danube and Black Sea), it supports regions and local authorities in protecting and restoring marine and freshwater ecosystems, preventing pollution and building a carbon-neutral, circular blue economy. More than 1 000 actions have been pledged under its Mission Charter, mobilising over EUR 8 billion, and over 200 demonstration sites are operational.

Other aspects of European efforts to share information, good practices, experience and lessons learnt to improve adaptation action comprise, among other things, the following initiatives.

(a) The European Climate Change Adaptation Platform Climate-ADAPT. This is a partnership between the European Commission and the European Environment Agency (EEA), maintained by the EEA with the support of the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA). Climate-ADAPT aims to support Europe in adapting to climate change by helping users to access and share data and information on expected climate change in case studies and potential adaptation solutions, and tools that support adaptation planning. The platform includes a database that contains quality-checked information that can be easily searched.

(b) The European Climate and Health Observatory. This is a multi-disciplinary partnership, jointly managed by the European Commission and the EEA, that supports Europe in preparing for and adapting to the impacts of climate change on human health. The Observatory covers the 40 EEA member and cooperating countries and aims

to support Europe in preparing for and adapting to the impacts of climate change on human health by providing access to relevant information and tools. It also supports information exchange and cooperation between relevant international, European, national, subnational and non-governmental actors.

(c) Interreg. This is one of the key EU instruments for supporting cooperation across borders through project funding. It aims to jointly tackle common challenges and find shared solutions in areas such as health, the environment, research, education, transport, sustainable energy and more. The current period's EUR 8 billion budget features closer cooperation with partner countries and a dedicated strand for the EU's outermost regions and neighbouring countries.

(d) LIFE programme. This is the EU's funding instrument for the environment and climate action. It was launched in 1992 and has co-financed thousands of environmental protection projects. While it has always had a strong focus on nature protection and biodiversity, the current programme period also includes funding projects related to the circular economy and quality of life, climate change mitigation and adaptation, and the clean energy transition.

4.9.2 Strengthening scientific research

Besides these efforts to develop science, planning and policies relevant to adaptation, policy innovation and pilot and demonstration projects, the EU puts a specific focus on **strengthening scientific research**. For example, it supports research aimed at deepening understanding of climate change (including research, systematic observation and early warning systems), vulnerability and adaptation solutions, and monitoring and evaluation. It does so, among other things, through the following.

(a) Horizon Europe. This is the EU's key funding programme for research and innovation, with an overall budget of EUR 95.5 billion, 35% of which is allocated to climate-related actions. It tackles climate change, helps to achieve the UN's Sustainable Development Goals and boosts the EU's competitiveness and growth. Through its design and participation rules, the programme facilitates collaboration across the EU and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges. It supports the creation and better dissemination of excellent knowledge and technologies across the EU.

(b) Copernicus Climate Change Services. C3S is one of six services of Copernicus, the Earth observation component of the EU's space programme, which offers information services that draw on satellite Earth observation and *in situ* (non-space) data. The Commission manages the programme, implemented in partnership with the EU Member States, the European Space Agency, the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for Medium-Range Weather Forecasts (ECMWF), EU agencies, Mercator Ocean International, the EEA and the JRC. Vast amounts of global data from satellites and ground-based, airborne and seaborne measurement systems, as well as numerical models, provide

information to help service providers, public authorities and other international organisations improve people's quality of life. The information services provided are free and openly accessible to users, in particular through the C3S Data Store Copernicus, the Copernicus Data Space Ecosystem (CDSE)|Europe's eyes on Earth, and WEkEO Copernicus and Sentinel data at your fingertips|WEkEO data access platforms.

(d) Destination Earth Climate Change Adaptation Digital Twin. This is a new type of climate information system that focuses on assessing the impacts of climate change and different adaptation strategies locally and regionally over multiple decades. A virtual representation of products, people, processes and even spatial environments, Digital Twin uses a fusion of numerical simulations and observations to create a virtual replica of Earth. Built in close partnership with over 90 institutions across Europe, Digital Twin combines several cutting-edge Earth system models and observations with the most advanced digital technologies, machine learning and artificial intelligence, and is integrated into applications for the sectors most affected by climate change.

(e) European Climate Data Explorer. This provides interactive access to a growing selection of climate indices. The underlying data are from the Climate Data Store of the Copernicus Climate Change Service.

The **European Climate Risk Assessment (EUCRA)** report (see also Section 4.3) makes a significant contribution to achieving the objective of closer European cooperation by: (1) providing a systematic assessment of the magnitude of current and future key climate risks; (2) addressing compound hazards, cross-border risks, cascading risks and systemic risks; (3) involving Commission stakeholders throughout the assessment process; (4) assessing the European policy context, risk ownership and the urgency to act for each key risk; and (5) providing complementary interactive tools on climate hazards and risks. As explained previously, the 2024 Commission Communication on managing climate risk responds to the EUCRA findings. It sets out how the EU and EU Member States can better anticipate, understand and address growing climate risks. It further presents how they can **prepare and implement policies that save lives, cut costs and protect prosperity across the EU**. The EU **Climate Resilience Dialogue** aims to narrow the climate protection gap (the gulf between how much is lost and how much is insured) and find ways to stimulate investment in good adaptation. The final report of the Climate Resilience Dialogue puts forward actions for increasing climate resilience in the EU and addressing the climate protection gap, with a focus on adaptation measures. As a follow up to the Dialogue, the Commission convened a Reflection Group on mobilising climate resilience financing.

4.10 Resilience and vulnerable groups

Climate risks do not affect everyone in the same way. Their impacts disproportionately affect the most vulnerable, shaped by a range of socio-economic and demographic factors including income, gender, age, disability and health status, as well as by conditions of social exclusion and marginalisation. These unequal effects are

particularly significant for certain people and communities, including migrants, ethnic minorities and indigenous people. 'Just resilience' refers to a principle aimed at responding to the unequal effects of climate change by ensuring that vulnerable individuals and social groups benefit equitably from adaptation measures and are not disproportionately affected. This includes addressing structural inequalities, promoting fair access to resources and decision-making, and recognising a diversity of perspectives and values. The European Climate Risk Assessment, the European Commission's Communication on managing climate risks, the European Commission's Communication on the EU Framework for Climate Resilience and the EU Preparedness Union Strategy, all underline the importance of support for people in vulnerable situations, regions and communities disproportionately impacted by climate risks with a view to promoting the principle of just resilience. Vulnerable groups are increasingly involved in planning and decision-making processes.

Across EU Member States considerations of justice are increasingly being incorporated into adaptation policy and planning. A similar trend can be observed at subnational level, where justice is receiving growing attention in urban adaptation planning. One example of embedding of the just resilience principle in climate adaptation policies is Ireland's new National Adaptation Framework. Prepared in accordance with the requirements of Ireland's Climate Action and Low Carbon Development Acts, it introduces community and public engagement and just resilience as new guiding principles. Its purpose is to ensure that adaptation is not only effective, but also fair, ethical and sustainable. This principle-based approach is intended to support decision-makers, communities and organisations in responding to climate change in ways that are both effective and equitable.

Climate risks and responses do not happen in a vacuum. There are historical contexts to consider, as well as other changes in society, including shifting resources, new dependencies, technological advancements and changing social structures and institutions. Climate risks are especially felt by the most vulnerable people due to a range of socio-economic factors, such as income, gender, age, disability, health and social exclusion (migrants, ethnic minorities and indigenous peoples are particularly affected). Pre-existing disadvantages reduce the capacity to recover from climate-induced disasters and poorly designed adaptation solutions can further deepen inequalities in the following four intersecting cases[66].

- **Group-based vulnerabilities:** Immigrants, ethnic minorities and indigenous peoples are subject to structural and historically embedded inequalities, making them particularly vulnerable to climate risks and maladaptive interventions. However, few studies have examined ethnicity-based vulnerabilities in the European context. For example, the chronic exclusion of indigenous communities from decision-making processes tends to compound maladaptive pathways and existing vulnerabilities and inequalities.

[66] EUCRA, https://climate-adapt.eea.europa.eu/en/eu-adaptation-policy/key-eu-actions/european-climate-risk-assessment.

- **Gender-based vulnerabilities:** Climate change impacts are not gender-neutral. Women, girls and marginalised groups often face greater risks because of unequal access to resources, limited decision-making power and weaker social protection[67]. This is why the Commission supports actions to reduce such adverse impacts and embed gender equality considerations in climate change adaptation policies.
- The EU Strategy on Adaptation to Climate Change, adopted in 2021, recognises the importance of addressing the disproportionate impact climate change has on vulnerable groups. In terms of implementation, several programmes and instruments, as the Just Transition Fund and the Social Climate Fund, contribute to climate change adaptation actions and the achievement of climate change adaptation objectives, and to supporting more vulnerable groups, including women, in making the transition to climate neutrality. The EU Gender Action Plan III (GAP III) supports actions in the green transition area, including climate resilience and climate change adaptation. A good practice example is the **Climate Change Adaptation through Watershed, Forest and Disaster-Risk Management and Governance (ACC) programme in Bolivia**, which combined gender mainstreaming using sex-disaggregated indicators, women's participation in climate decision-making and forest governance, and targeted support for women-led green value chains.
- **Socio-economic and occupation-based vulnerabilities:** Low-income households are likely to suffer more from climate change due to tighter financial constraints that limit their adaptive capacities. In many EU Member States, more vulnerable communities tend to live in dense urban environments. They may therefore be exposed to higher temperatures than others due to urban heat island effects. Workers with some specific occupations are particularly exposed to climate risks, both from being directly exposed to climate-related hazards (e.g. outdoor workers in agriculture, construction and emergency services, such as firefighters) and indirectly through impacts on their livelihoods (e.g. workers in tourism).
- **Age- and health-based vulnerabilities:** Existing health conditions (e.g. cardiovascular, respiratory and kidney disease, obesity and diabetes), disability status and age are significant biological risk factors for several climate-related health impacts (e.g. heatwaves as associated health risks and vector-borne diseases). For instance, pregnant women, infants, young children and older people are more vulnerable to heat extremes due to biological factors, which may also interact with social factors such as discrimination.

Near-term adaptation responses affect future inequalities, poverty, livelihood security and overall well-being. When social justice aspects are not adequately considered, adaptation actions can lead to maladaptation.

[67] European Climate Risk Assessment | Publications | European Environment Agency (EEA)

Avoiding such consequences requires concerted action at all levels and developing a clear pathway towards improving preparedness and resilience. This is why the Commission proactively includes relevant topics in bilateral dialogues, through green alliances and green partnerships and in relevant UN and other multilateral fora, bringing together government representatives, financiers and expert organisations from around the world. The Commission will continue to work with the EU Member States, the public, businesses and the EU institutions to increase the resilience of the EU's society and economy.

5 Support provided and mobilised

This chapter contains information on financial, technology development and transfer, and capacity-building support provided and mobilised by EU institutions and the European Investment Bank in 2023 and 2024 under Articles 9, 10 and 11 of the Paris Agreement.

5.1 National circumstances and institutional arrangements

The EU and EU Member States are collectively the world's largest contributor of development assistance. Since 2021, the EU's strategic response to foreign and development policy issues has been the Global Gateway, implemented using a 'Team Europe' approach that underscores the importance of close coordination between partner countries, EU institutions, EU Member States and EU development finance institutions for effective international cooperation.

The Global Gateway is the EU's contribution to narrowing the global investment gap worldwide. It is in line with the commitment of the Group of Seven (G7) leaders from June 2021 to launch a values-driven, high-standard and transparent infrastructure partnership to meet global infrastructure development needs. The Global Gateway is also fully aligned with the UN's Agenda 2030 and its Sustainable Development Goals and with the Paris Agreement.

The Global Gateway originally aimed to mobilise up to EUR 300 billion in investments between 2021 and 2027, using the Team Europe approach to support sustainable and high-quality projects worldwide. In October 2025, the European Commission announced that this target had been reached and set a new objective of mobilising EUR 400 billion in investments by 2027. These investments take into account the needs of partner countries and are designed to ensure lasting benefits for local communities. This allows the EU's partners not only to develop their societies and economies, but also to create opportunities for the EU Member States' private sector to share their know-how and solutions. An early milestone of the Global Gateway was the Africa-Europe Investment Package, with approximately EUR 150 billion in investment dedicated to bolstering cooperation with African partners. Implementation of the Global Gateway is also advanced in Asia and the Pacific and in Latin America and the Caribbean.

The Global Gateway is underpinned by the following financial instruments:

- the Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI-Global Europe);
- the Instrument for Pre-Accession Assistance (IPA) III;
- Interreg;
- InvestEU;
- Horizon Europe.

The most relevant for climate finance is NDICI-Global Europe, which has a budget of approximately EUR 79 billion for 2021-2027 and a spending target of 30% for climate. It consolidates previous development cooperation funds into one instrument and consists of three pillars:

- the geographic pillar supports dialogue and cooperation with third countries with a budget of approximately EUR 60 billion;
- the thematic pillar, with a budget of approximately EUR 6 billion, complements the geographic pillar by funding support for human rights and democracy, civil society, peace, stability and conflict prevention, and for tackling global challenges;
- the rapid response pillar, with a budget of approximately EUR 3 billion, is reserved for non-programmable actions for foreign policy needs, crisis response and resilience;
- an additional EUR 10 billion of unallocated funds is available for reacting to emerging challenges and priorities.

The Instrument for Pre-Accession Assistance III has a spending target for climate change adaptation of 18%, with the objective of its being increased to 20% by 2027.

A central part of NDICI-Global Europe is the European Fund for Sustainable Development Plus (EFSD+), used for mobilising additional public and private investment for sustainable development.

The Global Green Bond Initiative (GGBI) is the EU's flagship initiative under the Global Gateway that aims to mobilise up to EUR 20 billion of private capital for sustainable investment in EU partner countries through green bonds, while helping to develop strong domestic green bond markets. As the EU's largest Team Europe initiative, it brings together nine institutional partners (the EIB, the European Bank for Reconstruction and Development, the Spanish Agency for International Development Cooperation (AECID), the Italian National Promotional Institution (CDP), the Dutch Entrepreneurial Development Bank (FMO), the German Development Bank (KfW), Proparco, LuxDev, the Green Climate Fund) and Amundi, the leading European asset manager. The GGBI demonstrates the EU's commitment to working with partners worldwide to deliver tangible results on climate action and environmental protection, while attracting private investment and promoting high environmental standards globally, for the benefit of future generations.

As the EU Climate Bank (the EIB) does, the EIB Group plays a central role in supporting efforts to reach EU climate goals. Climate action is the leading priority of the EIB Group, with a target for the share of annual EIB Group finance dedicated to Group Green Finance to exceed 50%. In addition, to reflect the importance of the leveraging effect of EIB finance, the Group has a target of supporting EUR 1 trillion in green investment over the period 2021-2030. EIB Global (the arm of the EIB that works beyond the EU) is fully committed to supporting the reaching of the New Collective Quantified Goal for global climate finance through financing and partnerships.

The following chapters contain information on the support provided and mobilised by the Commission and the EIB in 2023 and 2024. Information on the support provided and mobilised by individual EU Member States can be found in their respective Biennial Transparency Reports (BTRs).

5.1.1 Systems and processes used to identify, track and report on support provided and mobilised

The EU tracks the provision of its support through a project-based monitoring and reporting system. The system uses the Rio markers established by the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD) to categorise and track the extent to which a project is deemed to provide support for climate change mitigation and adaptation, alongside more than 50 additional project markers that enable further support tracking, e.g. by geographical location, economic sector, financial instrument or funding source. In the case of EU and EU Member State spending on all official development assistance (ODA), data transparency is supported by the EU's visualisation tool on ODA spending[68].

The EIB determines climate finance attribution as part of project due diligence, by assessing individual project components against the EIB green finance methodology[69]. These definitions are anchored in the EU Taxonomy technical screening criteria for substantial contributions and follow the joint multilateral development bank (MDB) and International Development Finance Club (IDFC) climate finance methodologies. A climate action percentage is assigned to each project. Annually, the EIB provides the European Commission with a list of climate action projects for which disbursements were made during the reporting year for projects financed outside of the EU. This data is used by the Commission for its annual reporting on climate finance under the EU Governance Regulation.

How compliance is ensured with OECD DAC in the EU

The EU institutions are a member of the OECD Development Assistance Committee (DAC) alongside EU Member States that are also DAC members. The EU (EU institutions and EU Member States together) accounts for the largest share of total ODA among DAC members[70]. The EU ensures compliance with DAC rules mainly through membership-based adherence to common rules, standardised reporting, peer review, and the transparent publication of aid data. The EU institutions report their own ODA to the DAC and are assessed according to the same broad DAC framework on what can be counted as ODA[71]. In parallel, individual EU Member States report their own ODA separately.

Compliance is ensured in the following ways.

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[68] https://team-europe-explorer.europa.eu/index_en

[69] European Investment Bank Group Green Finance Definitions, version 3.0

[70] Development Cooperation Profiles: European Union institutions

[71] ODA standards | OECD

- The common DAC rules define what qualifies as ODA and set the eligibility criteria for reporting[72,73].
- DAC members, including the EU institutions, submit annual aid data to the OECD using standardised reporting methods, making it possible to consistently verify their reported spending[74].
- Periodic peer reviews also assess members' development policies and adherence to DAC principles, promoting accountability through expert scrutiny and recommendations[75].

OECD DAC statistics are published in databases and on dashboards that enable comparisons across donors, sectors, countries and aid types.

5.1.2 Challenges and limitations

In compiling the data and information for this section of the BTR, the following challenges were encountered.

- Existing reporting systems such as the OECD DAC's Creditor Reporting System database do not enable the systematic tracking of impacts on capacity building and the technology transfer of funded projects. Many projects contribute to the achievement of these objectives, but it is not possible to apply tracking metrics such as the Rio markers for these areas, which would provide more aggregated and quantitative information. In the absence of such systems, the information provided is largely of a qualitative nature, using examples where possible. This is why the information provided in common tabular format (CTF) Tables III.4 and III.5 is non-exhaustive and not representative of the full extent of resources provided and mobilised.
- Some reporting requirements, such as reporting information on how projects support different stages of the technology cycle, are very in-depth. Significant staff resources would be required for systematic reporting across the full portfolio of projects. However, it was useful to reflect on the overall approach to the programming of resources by illustrating how projects support the technology cycle.
- The European Commission's climate finance spending is distributed across six or more Directorates-General (DGs), making data collection challenging and resource-intensive.
- Comparing the timeline is challenging because the reporting method for multilateral contributions has changed over time. From 2020 to 2021, only data on multilateral commitments were published, whereas from 2022 to 2024, the

[72] Official development assistance – definition and coverage | OECD

[73] ODA standards | OECD

[74] Development Cooperation Profiles: European Union institutions

[75] The DAC's recommendations to the European Union: OECD Development Cooperation Peer Reviews: European Union 2025 | OECD

data reported multilateral disbursements. As a result, multilateral contributions are not directly comparable across the full period.

5.1.3 Experience and good practice: Mobilising climate finance through the international implementation of Article 2.1(c)

The EU and EU Member States consider that Article 2.1(c) of the Paris Agreement is complementary to the financial support committed, disbursed and mobilised under Article 9. Consistent with this understanding, the EU pursues, in parallel, the consistency of finance flows with low GHG emission and climate-resilient development pathways, and the provision of dedicated financial support for developing countries, as two interconnected pillars of its international climate finance action.

The EU actively engages with developing countries, including through the Veredas Dialogue and previously the Sharm el-Sheikh Dialogue, to build a shared and consensual understanding of how the objectives pursued under Article 2.1(c) and Article 9 reinforce one another, and to ensure that this positive link is coherently reflected in the implementation of both provisions.

The EU delivers this support through a set of instruments and partnerships highlighted in this chapter. For example, the European Fund for Social Development (EFSD)+ provides first-loss and subordinated capital within blended-finance structures, enabling commercial investment to be mobilised at lower risk-adjusted cost. The EU also supports local-currency financing and currency-risk mitigation instruments, such as the Currency Exchange Fund (TCX), to reduce the cost of capital faced by borrowers in developing countries, and advocates for faster and more predictable sovereign debt restructuring, including through debt-for-climate swaps, alongside the grant-based support provided through the Fund for Responding to Loss and Damage established at Conference of the Parties (COP) 27 and operationalised at COP28.

In providing this support, the EU works to strengthen the enabling conditions that determine the effectiveness of finance provided under Article 9, including regulatory stability, credible national climate plans, transparent procurement and deeper local capital markets in partner countries, drawing on its experience with regulatory convergence frameworks. This is intended to ensure that financial support provided under Article 9 catalyses additional investment consistent with the objectives of Article 2.1(c), while embedding just transition principles so that investment reaches local workers and communities and different regions.

5.1.4 Efforts taken to enhance the comparability and accuracy of information

Under the Enhanced Transparency Framework of the Paris Agreement, the EU works to harmonise and align its reporting with other international standards, institutions and systems. It bases its reporting on the OECD DAC Creditor Reporting System database, which uses the Rio marker system to identify flows with principal or significant climate adaptation and mitigation objectives. The European Commission further reports its

climate finance under Article 19 of 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. The reporting tables in the Annex to this Implementing Regulation were developed with a view to harmonisation with the draft CTFs discussed at the 2019 United Nations Climate Change Conference.

To ensure alignment across the various reporting requirements, the European Environment Agency (EEA) is currently developing a conversion tool to facilitate the transfer of data reported under the EU Governance Regulation into the UN Framework Convention on Climate Change (UNFCCC) BTR templates. The tool is intended to automatically fill in parts of the UNFCCC reporting tables, although certain manual adjustments will still be necessary. Its aim is both to reduce the reporting burden and to improve interoperability between the two reporting frameworks. The ongoing review of the EU Governance Regulation also presents an opportunity to further align UNFCCC reporting requirements with the EU's internal reporting framework, thereby improving the transparency, consistency and comparability of EU climate finance data.

The EIB works closely with multilateral development banks (MDBs) and European development finance institutions (EDFIs) to improve the comparability and accuracy of information reported on the financial support disbursed and mobilised through public interventions. The MDB/EDFIs reference guide for calculating and jointly reporting private investment mobilisation[76] was developed in 2018 and is still in use today. The purpose of the methodology in the reference guide is to identify and measure the private capital mobilised in MDB project activities. The guide includes key definitions used to ensure harmonisation across MDBs and EDFIs. Guidelines for measurements of different financial instruments have also been drawn up and rules developed for attribution in cases in which several MDBs are involved in one project to avoid double counting. The guidelines are the basis on which MDBs calculate their climate finance mobilisation, as published in their annual joint MDB climate finance report. Efforts are ongoing to further refine and specify this methodology and accommodate new products. The methodology update is expected to be adopted as from the 2026 reporting year.

5.1.5 National circumstances and institutional arrangements for the provision of technology development and transfer and capacity-building support

Cooperation on technology development and capacity-building support is an important part of the EU's international partnerships. The EU provides this support through its international cooperation architecture, bringing together the European Commission, the EIB, development finance institutions and other implementing partners to design, finance and deliver programmes in partner countries. Support is delivered through a range of EU instruments and programmes, including the Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI-Global Europe) and

[76] The MDB/EDFIs reference guide for calculating and jointly reporting private investment mobilisation

the external component of Horizon Europe. The external component of Horizon Europe enables the EU to enter into bilateral science and technology agreements with individual non-EU countries and engage in research dialogues with non-EU institutions. Horizon Europe is the world's largest research programme. At least 35% of its 2021 to 2027 budget (EUR 33.4 billion) is earmarked for climate research.

For example, under Horizon Europe, the European Commission supports the Technical Executive Committee (TEC) through a *pro bono* collaboration between the JRC and the TEC, valued at approximately USD 0.5 million. The collaboration, scheduled for implementation between 2026 and 2029, contributes to the TEC Rolling Workplan and focuses on several areas, including innovation benchmarking in developing countries, national innovation systems, and the decarbonisation of the iron, steel and cement sectors in developing economies. The European Commission is also the largest contributor to the operations of the United Nations Climate Technology Centre and Network (CTCN), with total voluntary contributions of USD 19.6 million[77] since 2014. This funding supports the CTCN's mandate to provide demand-driven technical assistance to step up technology transfers to developing countries (for more details see Section 5.5.1).

5.1.6 Alignment of support provided and mobilised to the priorities of developing countries and to the implementation of the Paris Agreement

As part of the European Consensus on Development, Article 20 commits the EU and EU Member States to supporting a range of sustainable development priorities through their development assistance, including climate change[78]. The principles also explicitly reference the Paris Agreement, stating the following (Article 45):

The EU and its Member States will integrate environment and climate change throughout their development cooperation strategies, including by promoting a sound balance between mitigation and adaptation. They will implement the 2030 Agenda and the Paris Climate Change Agreement through coordinated and coherent action and will maximise synergies. They will support national strategies, including cross-government planning and programming, which promote resilience, reduce climate risk and contribute to emission reduction, consistent with the implementation of Nationally Determined Contributions (NDCs), taking into account the challenges faced by developing countries, particularly Least Developed Countries (LDCs) and Small Island Developing States (SIDS). They will contribute to the emergence of local climate champions and actively disseminate and scale up best-practice projects, including by supporting multi-stakeholder platforms. The legally binding character of the Paris

[77] As of 15 October 2023, see page 63 of the UN CTCN (2023) 2022-2023 CTCN Progress Report https://www.ctc-n.org/file-download/download/public/38659.

[78] Joint statement by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the Commission.

Agreement and the requirement to prepare NDCs can also give impetus to national development planning in the context of the 2030 Agenda[79].

The general rules governing EU grants, procurement and financial assistance also require budget implementation to support the achievement of the objectives of the European Green Deal by ensuring that programmes and activities are implemented sustainably and do not undermine the environmental objectives, including climate change mitigation and adaptation, biodiversity protection, pollution prevention, the circular economy, and the sustainable use of natural resources[80].

The NDICI-Global Europe is the EU's main external financing instrument for 2021-2027, with a budget of approximately EUR 79 billion and a target of allocating 30% of its spending to climate action (see Chapter 5.2). It is structured around geographic and thematic programmes[81]. Geographic programmes translate jointly agreed priorities into country and regional interventions aligned with partner countries' strategies and needs, while thematic programmes address global and cross-cutting challenges, including climate change and environmental sustainability.

To ensure alignment of its international cooperation with the priorities of developing countries and the objectives of the Paris Agreement, the EU follows a structured programming process. This process is operationalised through Multiannual Indicative Programmes (MIPs), which set out priority areas, specific objectives, expected results and indicators, as well as indicative financial allocations. For the period 2021-2027, these programmes have been developed in an inclusive manner through dialogue with partner countries, EU Member States, civil society organisations, women and youth organisations, local authorities, the private sector, the UN and other donors and key stakeholders[82].

Based on MIPs, the European Commission adopts Annual Action Plans and/or individual measures each year for each partner, setting out the implementation of these programmes. EU Delegations in partner countries play a key role in programming (from identification to formulation) and implementing EU bilateral and regional cooperation on the ground, while maintaining continuous dialogue with partner-country authorities and stakeholders.

EU-supported programmes and operations are further guided by strong environmental and climate safeguards set out in the Neighbourhood, Development and International Cooperation Instrument (NDICI) Regulation[83]. In particular, Article 8 states that programmes and actions under the NDICI 'shall mainstream the fight against climate

[79] Joint statement by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the Commission.

[80] Regulation (EU, Euratom) 2024/2509 of the European Parliament and of the Council of 23 September 2024 on the financial rules applicable to the general budget of the Union (recast).

[81] Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI-Global Europe).

[82] Global Europe - Programming.

[83] Regulation (EU) 2021/947 of the European Parliament and of the Council of 9 June 2021.

change' and be 'guided by the principles of 'do no harm' and of 'leaving no one behind''. Article 29 also establishes that EU funding under the NDICI 'shall not support actions or measures' which 'are incompatible with the recipient country's NDC under the Paris Agreement'.

As part of NDICI-Global Europe and a key financial tool of the Global Gateway strategy, the EFSD+ promotes sustainable investments in the EU's partner countries. It provides financial capacity through grants, technical assistance and risk-sharing instruments to mobilise public and private financing in support of sustainable and inclusive economic, environmental and social development (see Chapter 5.4.3). Financing and investment operations eligible for support under its External Action Guarantee 'shall be (among others), consistent and aligned [...] to the partner countries' strategies and policies' (Article 35 of the NDICI Regulation[84]), including their NDCs under the Paris Agreement.

The Building Safety and Resilience in the Pacific Phase II (BSRP II) project is an example of how EU-supported projects are aligned with national development priorities. The project aims to reduce the impacts of disasters, including those linked to climate change, by strengthening disaster risk governance, preparedness, resilience and risk-informed planning across Pacific Island countries. It responds directly to country-led priorities, having been designed collaboratively with Pacific governments, and supports national and local capacities, risk information, preparedness and resilience building[85]. A recent example of this is the support of Palau in improving its emergency response capabilities. BSRP II project has partnered with Palau's National Emergency Management Office to facilitate access to vital risk data, modern equipment and staff training on geographic information systems and drone operations. Further to that, seven defective fire hydrant units have been replaced with seven new ones in underserved areas, and water lines and fittings have been upgraded to ensure full operational capability and compliance with international fire safety standards. Both initiatives come timely, with the El Nino effects already appearing in Palau and emergency incidents increasing.

5.2 Assumptions, definitions and methodologies

The EU uses the Rio markers to identify, track and report financial, technology development and transfer, and capacity-building support.

The markers indicate whether climate change is a principal or significant objective of an activity. They were developed as policy indicators rather than as a tool for measuring climate finance precisely. An activity may therefore be marked against several objectives, including mitigation, adaptation, biodiversity and desertification.

The EU therefore applies specific coefficients to Rio-marked activities to estimate climate finance, as shown in Table 19.

[84] Regulation (EU) 2021/947 of the European Parliament and of the Council of 9 June 2021.

[85] BSRP_Factsheet_2023_V2_Web.pdf.

Table 19: Rio marker approach

Markers	Mitigation (%)	Adaptation (%)	Cross-cutting (%)	Total (%)
2 m & 0 A	100	0	0	100
1 m & 0 A	40	0	0	40
0 m & 2 A	0	100	0	100
0 m & 1 A	0	40	0	40
2 m & 1 A	100	0	0	100
1 m & 2 A	40	100	0	100
2 m & 2 A	100	100	100	100
1 m & 1 A	40	40	40	40

2: 'Principal'; 1: 'Significant'; 0: 'Not targeted'. M: Mitigation; A: Adaptation.

Source: Own compilation.

For example, if the EU spent EUR 1 million on a project that was marked as 'Principal' for mitigation ('2 M' in the table above) and 'Significant' for adaptation ('1 A' in the table above), 100% of that EUR 1 million would be categorised as mitigation and 0% as adaptation. Similarly, if the project were not marked for mitigation ('0 M' in the table above) but were marked as 'Significant' for adaptation ('1 A' in the table above), 40% of that EUR 1 million would be categorised as adaptation, and 0% as mitigation.

The EIB's climate-relevant financial flows are tracked using the joint approach developed by the MDBs, which does not use the Rio markers. In 2015, common principles for tracking mitigation finance were developed with the International Development Finance Club (IDFC) and other MDBs. The Common Principles for Climate Mitigation Finance Tracking were updated in October 2021 and again in December 2023. In 2020, the EIB Board approved the EIB Group Climate Bank Roadmap 2021-2025, which set out how the Group planned to deliver on its new climate and environmental ambitions. In October 2025, the EIB Board approved Phase 2 of the EIB Group Climate Bank Roadmap covering the period 2026-2030. Under these policies, the EU Taxonomy[86] technical screening criteria are used as a reference framework for tracking EIB Group green finance. The EIB started to apply the 'substantial contribution' criteria of the first EU Taxonomy Delegated Act[87] covering climate change mitigation and adaptation from

[86] EU taxonomy for sustainable activities, https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en.

[87] Commission Delegated Regulation (EU) 2021/2139 supplementing Regulation (EU) 2020/852 by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, https://eur-lex.europa.eu/eli/reg_del/2021/2139/oj.

the start of 2022, while remaining within the overall framework of the Joint MDB/International Development Finance Club (IDFC) Common Principles. Further details on the EIB tracking methodology are available on the EIB website[88]. The Joint Reports on MDB Climate Finance include climate co-financing flows that are invested alongside the climate finance activities of MDBs, together with an explanation of how these are determined. Climate co-finance is defined as the volume of financial resources contributed by external public and private bodies alongside climate finance invested by MDBs.

Table 20 below provides a description of the underlying assumptions, definitions and methodologies. Unless otherwise noted, the same assumptions, definitions and methodologies are used to report on:

- financial support;
- technology development and transfers;
- capacity-building support.

Table 20: Assumptions, definitions and methodologies

Element	Description
Reporting years	2023 and 2024
Conversion from domestic currency to USD	The following currency exchange rates are used throughout the climate finance chapter and its CTF tables, and are average annual conversion rates: • 2023: 1 EUR to 1.0824 USD[89] • 2024: 1 EUR to 1.0822 USD[90].
Status	The European Commission categorises the status of its climate finance as either 'committed' or 'disbursed' but reports on committed funding for a given calendar year, in this case 2023 and 2024. The status of the EIB's climate finance is 'disbursed' for 2023 and 2024.
Channel	The EU distinguishes between bilateral and multilateral channels, using the following OECD DAC definitions. Multilateral: Flows for which the governing boards of the multilateral organisations in question have the

[88] EIB Group Green Finance Definitions, version 3.0, https://www.eib.org/en/publications/20250367-eib-group-green-finance-definitions.

[89] 2023 EUR to USD exchange rate: https://www.exchangerates.org.uk/EUR-USD-spot-exchange-rates-history-2023.html.

[90] 2024 EUR to USD exchange rate: https://www.exchangerates.org.uk/EUR-USD-spot-exchange-rates-history-2024.html.

	unqualified right to allocate funds as they see fit within the limits prescribed by the organisations' mandate. Bilateral: Direct bilateral funding, as well as funding through multilateral organisations earmarked for specific uses, are reported as bilateral flows.
Funding sources	The European Commission categorises the funding source of its climate finance as ODA. The EIB categorises its funding sources as ODA, Other Official Flows (OOF) and Other.
Financial instruments	The European Commission categorises the financial instrument used in its climate finance as grants. The majority of EIB funds reported here are provided in the form of loans, alongside several grants, equity investments and guarantees.
Additional information on instruments and funding sources	All flows from the European Commission are 100% grants for 2023 & 2024. Under Implementing Regulation (EU) 2020/1208, EU Member States are required to report the financial instrument used for climate finance (e.g. grant, concessional or non-concessional loans, etc.). Where available, the grant equivalent of the support provided should also be reported, in accordance with the information reported to the UN or OECD under internationally agreed reporting requirements.
Identification of the type of support	The EU defines the type of support as follows. • **Mitigation:** An activity should be regarded as being related to climate change mitigation if it contributes to the objective of stabilising GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system; the activity would do so by promoting efforts to reduce or limit GHG emissions or to improve GHG sequestration (adapted from the operational definition and criteria for eligibility used in the OECD DAC Policy Markers). • **Adaptation:** An activity should be regarded as being related to adaptation if it is intended to reduce the vulnerability of human or natural

	systems to the impacts of climate change and climate-related risks by maintaining or increasing adaptive capacity and resilience. This encompasses activities ranging from information and knowledge generation to capacity development, planning and implementing climate change adaptation actions (adapted from the operational definition and criteria for eligibility used in the OECD DAC Policy Markers).
Sectors and subsectors	The EU puts the provision of climate finance into the following eight sectors: energy, transport and storage, industry, agriculture, forestry, water supply and sanitation, other.
Whether capacity-building and/or technology development and transfer objectives are supported	Both capacity-building and technology development and transfer objectives are supported.
Definitions relating to technology development and transfer and capacity-building support	The EU uses the following definitions to identify initiatives, programmes and projects that contribute to technology development and transfer as well as capacity building. • **Climate-relevant technology development and transfer:** A broad set of processes covering exchanges of know-how relating to, and experience of, as well as providing equipment for, mitigating and adapting to climate change among various stakeholders such as governments, private sector bodies, financial institutions, non-governmental organisations (NGOs) and research/education institutions. The broad and inclusive term 'transfer' comprises the process of learning to understand, use and replicate a technology, including the capacity to take the most suitable technology, adapt it to local conditions and integrate it into indigenous technologies (adapted from the IPCC definition of climate-relevant technology transfer).

	• **Climate-relevant capacity building:** Capacity building is a process which seeks to build, develop, strengthen, enhance and improve existing scientific and technical skills, capabilities and institutions, particularly in developing countries, to enable them to assess, adapt, manage and develop technologies. Capacity building must be country-driven, addressing the specific needs and conditions of the countries concerned and reflecting their national sustainable development strategies, priorities and initiatives (adapted from the UNFCCC definition of capacity-building activities).
Climate-specific	The European Commission categorises flows as climate-specific if they are labelled with a Rio marker under the OECD DAC Creditor Reporting System. The EIB identifies its adaptation and mitigation flows using the joint approach developed by the MDBs[91].
Avoiding double counting	The EU addresses double counting in its report as follows: • Double counting among multiple Parties: This report covers support from the European Commission and the EIB. Support disbursed or mobilised by EU Member States is not reported here but in the BTRs of each EU Member State. The EIB reports contributions on an outflow basis. If information included in this report is aggregated with other flows, e.g. reported by the MDBs, corresponding deductions must be made to prevent double counting. • Double counting among multiple Parties involved in the mobilisation of private finance through public interventions. As part of their joint reporting, the MDBs net out potentially double-counted co-financing (including private finance mobilisation) by adjusting the reported

[91] See Annex C.2 (adaptation) and C.3 (mitigation) for a description of the methodological steps, https://thedocs.worldbank.org/en/doc/3258e1d4c1e84fd961b79fe54e7df85c-0020012023/original/2023-0128-MDB-Report-2022-NEW.pdf.

	figures in cases where multiple MDBs provide co-financing for a project. • Double counting with resources used under Article 6: The EU does not use internationally transferred mitigation outcomes towards its NDC. The support disbursed and mobilised does not include resources used under Article 6. • Double counting of actions targeting both adaptation and mitigation As a single action can target both mitigation and adaptation, the EU approach to using the Rio markers has been to introduce the cross-cutting category and to establish a system for attributing Rio marker scores when an action targets both adaptation and mitigation, avoiding double counting between adaptation and mitigation. Total contributions are thus the sum of adaptation, mitigation and cross-cutting. Attribution approach for projects with multiple recipient countries: the EU institutions and the EIB do not apply attribution in their reporting when flows target multiple recipient countries. In these cases, the category 'regional' is used or the name of the region is specified.
Definition of public and private climate finance	The European Commission reports grant-based ODA flows as public finance. The EIB reports its climate-specific outflows as public climate finance and its climate-specific private co-financing as private climate finance.
Approach to determining private finance as mobilised by public interventions	The EIB applies the joint MDB-DFI methodology for the mobilisation of private finance[92]. Only private co-financing that meets the methodology's eligibility criteria is reported as mobilised, either through direct or indirect mobilisation, and allocated among participating institutions according to agreed attribution rules. As a prerequisite for reporting private finance mobilisation, each operation undergoes an additionality and impact assessment, whether EIB support addresses market failures or sub-optimal investment situations,

[92] 2024 Joint Report: Mobilisation of Private Finance by MDBs and DFIs

	constructively shapes the investment and complements available sources of finance, thereby demonstrating the additionality of the EIB intervention[93]. Mobilisation is measured using operation-level financing and counterparty data at year-end to identify public and private funding sources.
Addresses the needs and priorities of developing country Parties	The EU's programming and financing framework[94] provides for support to be aligned with partner-country needs and priorities and with the EU's international commitments, including the Paris Agreement. Through joint programming and the Team Europe approach, the EU and its Member States work on the basis of a shared analysis to identify coordinated responses with all parties involved. The mainstreaming of environmental and climate considerations is anchored in the EU's legal and policy framework, notably Articles 11 and 191 TFEU, the European Consensus on Development, the European Green Deal and the 'green and clean' principle underpinning the Global Gateway strategy. Together, these commitments provide the basis for systematically integrating climate and environmental considerations into EU international partnerships, including in programming and financing decisions and based on the needs and priorities of partner countries.
Alignment with the long-term goals of the Paris Agreement	The EIB Group Climate Bank Roadmap for 2021-2025, published in 2020, set out how the Group would deliver on new climate and environment commitments, including how it will align new operations with the temperature and resilience goals of the Paris Agreement from 2021 onwards. The second phase of the EIB Climate Bank Roadmap covering the period 2026-2030 maintains the ambition on Paris alignment of operations and includes in its mission statement the objective to support delivery of EU climate and nature goals, including limiting global warming to 1.5 °Celsius. NDICI-Global Europe is aligned with the Paris Agreement through both its overall programming principles and its

[93] Additionality and Impact Measurement.

[94] How we design programmes - International Partnerships - European Commission

	exclusion criteria. Actions supported under the Instrument should be guided by the Paris Agreement and contribute to achieving the sustainable development goals (SDGs) and funding must not support actions or measures that are incompatible with the recipient country's Nationally Determined Contribution (NDC) under the Paris Agreement, or that promote investments in fossil fuels.[95]
Determination of new and additional financial resources	The financial resources reported in the EU's Second Biennial Transparency Report are considered 'new and additional resources,' meaning that they were committed after and not included in the most recent Biennial Report under the UNFCCC (i.e. the new and additional resources were committed in either 2023 or 2024). As EU budgets are calculated on an annual basis, each annual commitment cycle comprises new and additional resources.
Progression from previous levels in the provision and mobilisation of finance under the Paris Agreement	This is the second time that support under the Paris Agreement is reported. This support constitutes a progression from previous levels of support reported in Biennial Reports under the UNFCCC. Between 2014 and 2022, EU support from public sources to developing countries increased by 119%.
Approach to reporting multilateral finance	• Inflows/outflows: all multilateral finance is disbursed by the EIB, which is reported based on outflows. There were no inflows from the European Commission budget to the EIB in the reporting period. Consequently, no inflows are reported in the BTR of the EU. • Climate-specific shares: the EIB identifies its adaptation and mitigation flows using the joint approach developed by the MDBs. For all programmes/projects, only the climate-specific components are aggregated into overall EU multilateral finance. • Core/general: the European Commission does not report on core/general support to multilateral

[95] Publications Office.

	institutions for 2023 and 2024. The EIB reports on an outflow basis; a distinction between core/general and climate-specific flows is therefore not applicable as this only applies when reporting inflows to multilateral institutions. • Attribution to the reporting Party: attribution does not apply to the EIB's reporting because the EIB reports multilateral climate finance on an outflow basis. Attribution only applies when Parties report multilateral finance based on their contributions (inflows) to multilateral institutions. To avoid double counting, EU Member States do not report inflows to the EIB in their climate finance reporting.

Source: Own compilation

5.3 Financial support provided and mobilised

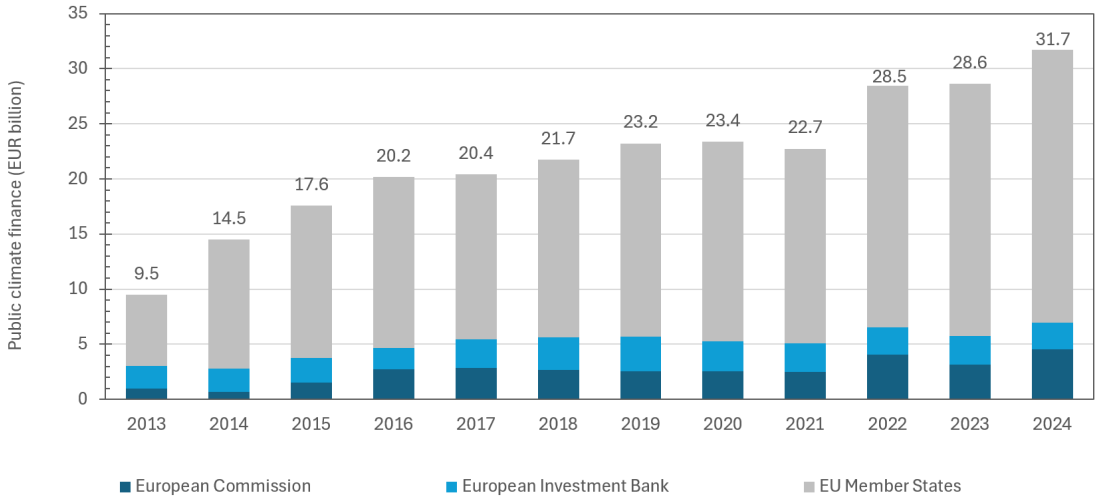
International public climate finance, together with climate finance from private sources, plays a crucial role in supporting developing countries in their adaptation and mitigation efforts to implement the Paris Agreement.

This section provides information on the total public climate finance provided to developing countries through bilateral and multilateral channels in 2023 and 2024 as well as on additional private climate finance mobilised by the EIB in 2023 and 2024[96]. Climate finance committed through bilateral channels is reported in Section 5.3.1, climate finance provided through multilateral channels is reported in Section 5.3.2 , and additional climate finance is reported in Section 5.3.3.

Since 2013, the total public climate finance provided by the European Commission, the EIB, and the EU Member States has increased from EUR 9.5 billion in 2013 to EUR 31.7 billion in 2024 (see Figure 43).

[96] In this BRT, the EU reports the support provided to all countries eligible to receive ODA, as listed in the 'DAC List of ODA Recipients', https://www.oecd.org/en/topics/sub-issues/oda-eligibility-and-conditions/dac-list-of-oda-recipients.html.

Figure 43: Public climate finance by the EU and its Member States, 2013-2024

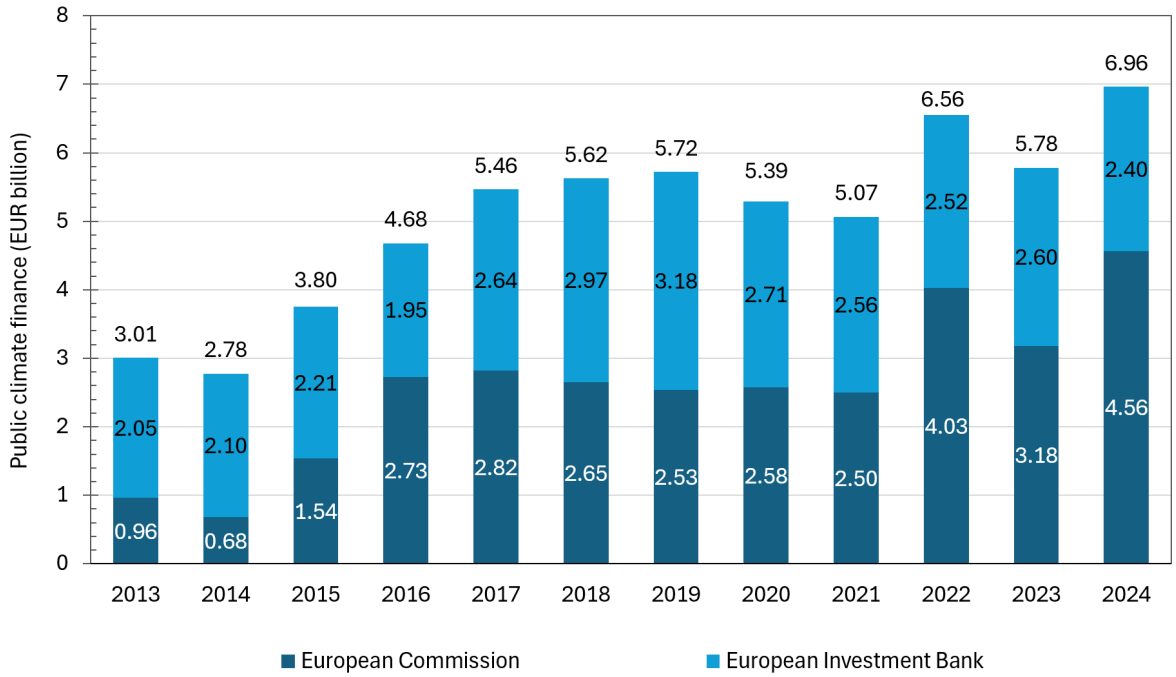


Note: Data for 2020 and 2021 are based on support committed; data for 2022, 2023 and 2024 are based on bilateral support committed and multilateral support disbursed. Data for earlier years are not directly comparable, due to methodological changes. Financial amounts up to 2019 include the United Kingdom.

Source: Own illustration based on European Commission and EIB data and submissions from Member States

Over the past 10 years, the total climate finance contributed by the European Commission and the EIB has increased by 131%, from approximately EUR 3 billion in 2013 to approximately 7 billion in 2024 (see Figure 44).

Figure 44: Climate finance to developing countries provided by the Commission and the EIB, 2013-2024



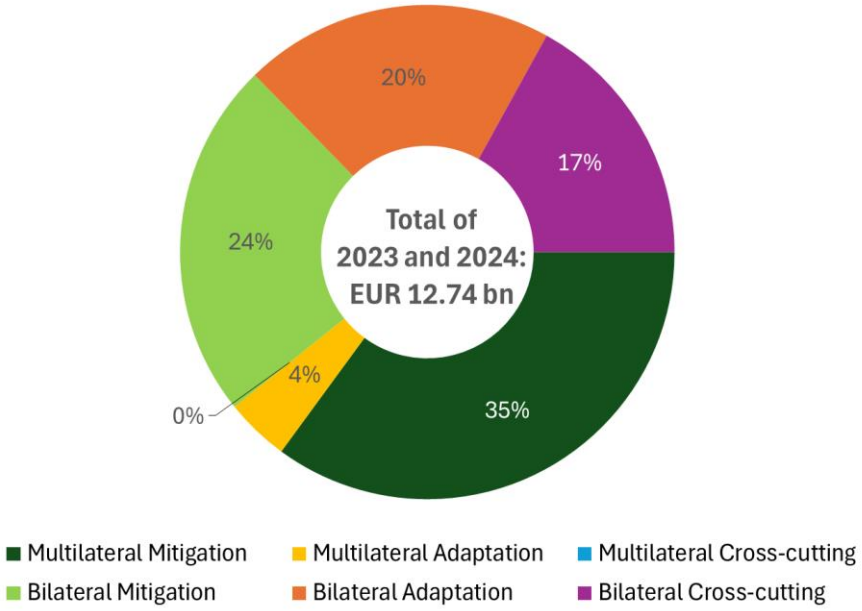
Note: Individual European Commission and EIB funding in the graph may not add up to the total due to rounding. Additionally, data for 2020 and 2021 are based on support committed; data for 2022, 2023 and 2024 are based on bilateral support committed and multilateral support disbursed. Data for earlier years are not directly comparable, due to methodological changes.

Source: Own illustration based on European Commission and EIB data.

During 2023 and 2024, the total climate finance contributed by the European Commission and the EIB amounted to EUR 12.7 billion, of which 59% was allocated to mitigation, 24% to adaptation and 17% to cross-cutting action[97]. 39% of the finance was channelled multilaterally, i.e. by the EIB, and 61% bilaterally, i.e. by the European Commission. Figure 45 gives a breakdown of the total bilateral and multilateral climate finance by type of support.

97 Percentages do not add up to 100% due to rounding.

Figure 45: Total climate finance by channel and type of support, 2023-2024

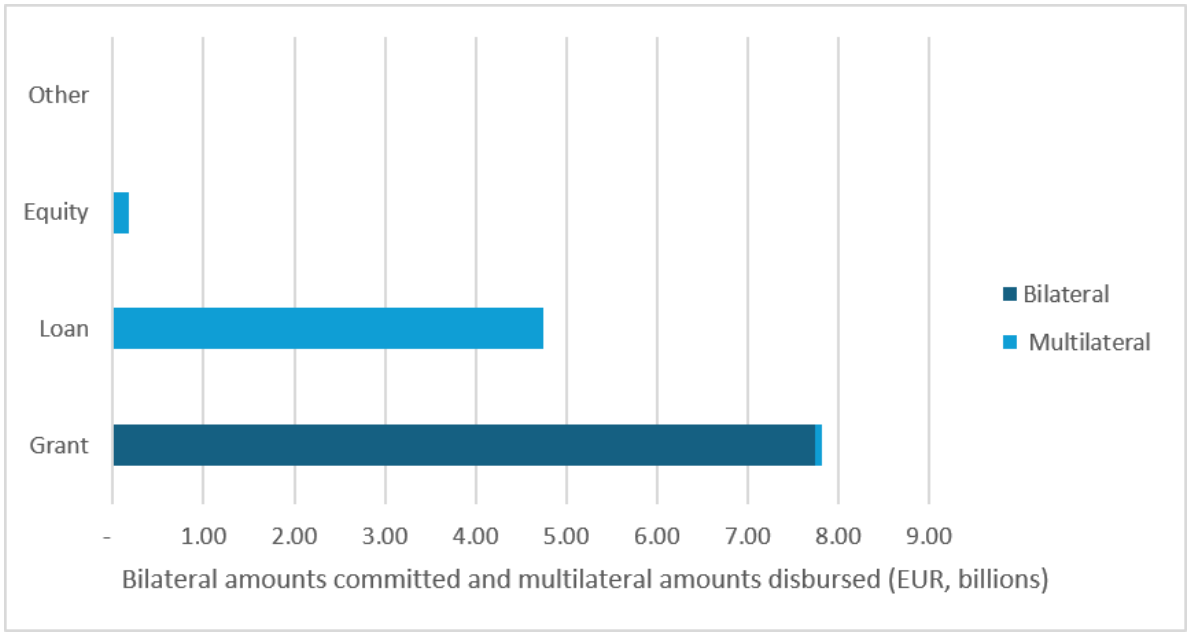


Note: Multilateral amounts are disbursed finance from the EIB, and bilateral amounts are committed finance from the European Commission.

Source: Own illustration based on European Commission and EIB data.

In 2023 and 2024, bilateral climate finance was exclusively provided as grants, whereas multilateral climate finance was provided predominantly in the form of delivered through loans (see Figure 46).

Figure 46: Total climate finance by channel and instrument, 2023-2024



Note: Multilateral amounts are disbursed finance from the EIB, and bilateral amounts are committed finance from the European Commission.

Source: Own illustration based on European Commission and EIB data.

5.3.1 Bilateral financial support

Bilateral climate finance reported in this BTR are funds committed by the European Commission. All climate finance committed by the European Commission to developing countries in 2023 and 2024 was in the form of grants. This climate finance was marked by the Rio markers, as described in before, and is summarised below for the years 2023 and 2024. The summary highlights the amounts allocated to mitigation, adaptation and cross-cutting activities, as well as the share of funding directed to LDCs.

The EU and its Member States are the world's largest provider of climate finance. In 2023 and 2024, the European Commission committed a total of EUR 7.7 billion in bilateral climate finance to developing countries.[98] Of the total bilateral climate finance committed, EUR 3.0 billion (39%) was marked for mitigation, EUR 2.6 billion (33%) for adaptation, and EUR 2.2 billion (28%) for cross-cutting action (see Figure 48). The majority of bilateral climate finance was directed to Africa, accounting for 52% of total allocations in 2023 and 35% in 2024 (see Figure 47). In 2023, Asia received the second largest share (20%), whereas in 2024, Europe ranked second with 31%.

Of the total climate finance committed by the European Commission in 2023 and 2024, almost EUR 1.7 billion (21.4%) was committed to LDCs. The funding is marked by country and by region, but in some cases a regional marker is used as climate finance goes to a group of countries, making it impossible to assign specific amounts to individual countries in that group. Of the total climate finance committed to LDCs in 2023 and 2024, at least EUR 498 million (30.1%) was marked for mitigation, EUR 846 million (51.1%) for adaptation and EUR 311 million (18.8%) for cross-cutting action.

Of the European Commission’s total climate finance commitments in 2023 and 2024, approximately EUR 1.2 billion was allocated to the multisector category, EUR 1.0 billion to industry, and EUR 970 million to energy generation, distribution and efficiency.

A further breakdown in the climate finance committed by the European Commission in 2023 and 2024 is set out in Table 21 and Table 22 (by subsector), and Table 23 and Table 24 (by region).

98 In the text, figures are rounded to one decimal place.

Table 21: Bilateral climate finance committed by the European Commission for mitigation, adaptation and cross-cutting by subsector, 2023

Subsector	Mitigation		Adaptation		Cross-cutting		Total		%
	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	
Education	0.02	0.02	0.03	0.04	0.02	0.03	0.08	0.08	2%
Health	-	-	0.07	0.07	-	-	0.07	0.07	2%
Population policies/ programmes and reproductive health	-	-	0.01	0.01	-	-	0.01	0.01	0%
Water and sanitation	0.17	0.18	0.18	0.19	0.03	0.03	0.37	0.40	12%
Government and civil society	0.03	0.03	0.09	0.10	0.18	0.20	0.30	0.33	10%
Other social infrastructure and services	0.00	0.00	0.06	0.06	0.01	0.01	0.06	0.07	2%
Transport and storage	0.11	0.12	0.01	0.01	0.05	0.05	0.17	0.18	5%
Communications	-	-	0.05	0.05	0.00	0.00	0.05	0.05	2%
Energy generation, distribution and efficiency	0.21	0.23	0.20	0.22	0.08	0.09	0.49	0.53	15%
Banking and financial services	-	-	-	-	- 0.02	- 0.03	- 0.02	- 0.03	-1%
Business and other services	0.05	0.05	0.02	0.02	0.01	0.01	0.08	0.08	2%
Agriculture	0.07	0.07	0.33	0.36	0.06	0.06	0.46	0.50	14%
Forestry	0.07	0.08	0.00	0.00	0.01	0.02	0.09	0.10	3%
Fishing	-	-	0.04	0.04	0.01	0.02	0.05	0.06	2%
Industry	0.12	0.12	-	-	0.01	0.01	0.13	0.14	4%
Trade policy and regulations and trade-related adjustment	0.00	0.00	-	-	0.02	0.02	0.03	0.03	1%
Tourism	-	-	0.00	0.00	0.00	0.00	0.01	0.01	0%
General environmental protection	0.04	0.04	0.07	0.08	0.15	0.16	0.26	0.28	8%
Other multisector	0.02	0.03	0.20	0.22	0.28	0.30	0.50	0.54	16%
Emergency response	-	-	0.00	0.00	-	-	0.00	0.00	0%
Unallocated/ Unspecified	0.00	0.00	-	-	-	-	0.00	0.00	0%
Total	**0.90**	**0.98**	**1.37**	**1.48**	**0.91**	**0.99**	**3.18**	**3.44**	**100%**

Note: Amounts for individual sectors may not add up to the total due to rounding. Percentages may not add up to 100% due to rounding.

Source: European Commission data.

Table 22: Bilateral climate finance committed by the European Commission for mitigation, adaptation and cross-cutting by subsector, 2024

Subsector	Mitigation		Adaptation		Cross-cutting		Total		%
	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	
Education	0.03	0.04	0.03	0.03	0.02	0.02	0.08	0.09	2%
Health	-	-	0.08	0.09	-	-	0.08	0.09	2%
Water and sanitation	0.24	0.26	0.12	0.13	0.01	0.01	0.37	0.40	8%
Government and civil society	0.07	0.07	0.30	0.33	0.12	0.13	0.49	0.53	11%
Other social infrastructure and services	0.00	0.00	0.02	0.02	0.00	0.00	0.03	0.03	1%
Transport and storage	0.35	0.38	0.02	0.03	0.12	0.13	0.49	0.54	11%
Communications	-	-	0.02	0.02	0.03	0.03	0.05	0.05	1%
Energy generation, distribution and efficiency	0.27	0.29	0.12	0.13	0.09	0.10	0.48	0.52	11%
Banking and financial services	-	-	-	-	0.01	0.01	0.01	0.01	0%
Business and other services	0.04	0.05	0.01	0.01	0.04	0.04	0.09	0.09	2%
Agriculture	0.03	0.03	0.10	0.11	0.20	0.21	0.33	0.36	7%
Forestry	0.02	0.02	-	-	0.02	0.02	0.04	0.04	1%
Fishing	-	-	0.03	0.03	-	-	0.03	0.03	1%
Industry	0.81	0.88	0.06	0.07	0.02	0.02	0.89	0.96	19%
Mineral resources and mining	-	-	-	-	0.01	0.01	0.01	0.01	0%
Trade policy and regulations and trade-related adjustment	-	-	-	-	0.07	0.08	0.07	0.08	2%
Tourism	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0%
General environmental protection	0.06	0.06	0.13	0.14	0.12	0.13	0.31	0.33	7%
Other multisector	0.17	0.18	0.17	0.18	0.38	0.41	0.71	0.77	16%
Unallocated/ Unspecified	-	-	-	-	0.00	0.00	0.00	0.00	0%
Total	**2.09**	**2.26**	**1.22**	**1.32**	**1.25**	**1.35**	**4.56**	**4.93**	**100%**

Note: Amounts for individual sectors may not add up to the total due to rounding. Percentages may not add up to 100% due to rounding.

Source: European Commission data.

Table 23: Bilateral climate finance committed by the European Commission for mitigation, adaptation and cross-cutting by region, 2023

Region	Mitigation		Adaptation		Cross-cutting		Total		%
	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	
Europe	**0.29**	**0.31**	**0.03**	**0.03**	**0.18**	**0.20**	**0.50**	**0.54**	**16%**
Eastern Europe	-	-	0.01	0.01	-	-	0.01	0.01	
Southern Europe	-	-	-	-	0.03	0.03	0.03	0.03	
Europe, multiple	0.29	0.31	0.02	0.02	0.16	0.17	0.46	0.50	
Africa	**0.43**	**0.47**	**0.87**	**0.94**	**0.35**	**0.38**	**1.65**	**1.78**	**52%**
Northern Africa	0.02	0.02	0.12	0.12	0.00	0.00	0.14	0.15	
Eastern Africa	0.08	0.09	0.26	0.28	0.08	0.08	0.42	0.45	
Middle Africa	0.06	0.06	0.05	0.05	0.03	0.03	0.13	0.14	
Western Africa	0.16	0.17	0.22	0.24	0.05	0.05	0.43	0.46	
Southern Africa	0.07	0.07	0.02	0.02	-	-	0.08	0.09	
Africa, multiple	0.05	0.05	0.21	0.23	0.19	0.21	0.45	0.49	
America	**0.04**	**0.04**	**0.06**	**0.06**	**0.06**	**0.07**	**0.16**	**0.17**	**5%**
Central America	0.02	0.02	-	-	0.02	0.02	0.04	0.04	
South America	0.04	0.04	0.06	0.06	0.01	0.01	0.10	0.11	
Carribean	0.00	0.00	0.00	0.00	0.03	0.03	0.04	0.04	
America, multiple	- 0.02	- 0.02	-	-	-	-	- 0.02	- 0.02	
Asia	**0.12**	**0.13**	**0.36**	**0.39**	**0.17**	**0.18**	**0.65**	**0.70**	**20%**
Central Asia	0.01	0.01	0.02	0.02	0.01	0.01	0.03	0.04	
Eastern Asia	0.00	0.00	-	-	0.01	0.01	0.01	0.01	
South-eastern Asia	0.02	0.02	0.04	0.04	0.03	0.03	0.08	0.09	
Southern Asia	0.07	0.08	0.10	0.11	0.13	0.14	0.30	0.32	
Western Asia	-	-	-	-	0.00	0.00	0.00	0.00	
Asia, multiple	0.02	0.02	0.20	0.22	0.00	0.00	0.23	0.25	
Oceania	**-**	**-**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**	**0.02**	**1%**
Melanesia	-	-	-	-	0.01	0.01	0.01	0.01	
Micronesia	-	-	0.01	0.01	-	-	0.01	0.01	
Polynesia	-	-	-	-	-	-	-	-	
Oceania, multiple	-	-	-	-	0.00	0.00	0.00	0.00	
Unspecified	**0.03**	**0.03**	**0.05**	**0.05**	**0.13**	**0.14**	**0.20**	**0.22**	**6%**
Total	**0.90**	**0.98**	**1.37**	**1.48**	**0.91**	**0.98**	**3.18**	**3.44**	**100%**

Note: Amounts for individual sub-regions may not add up to the total due to rounding. Percentages may not add up to 100% due to rounding. Countries are classified into regions according to the UN region classification.

Source: European Commission data.

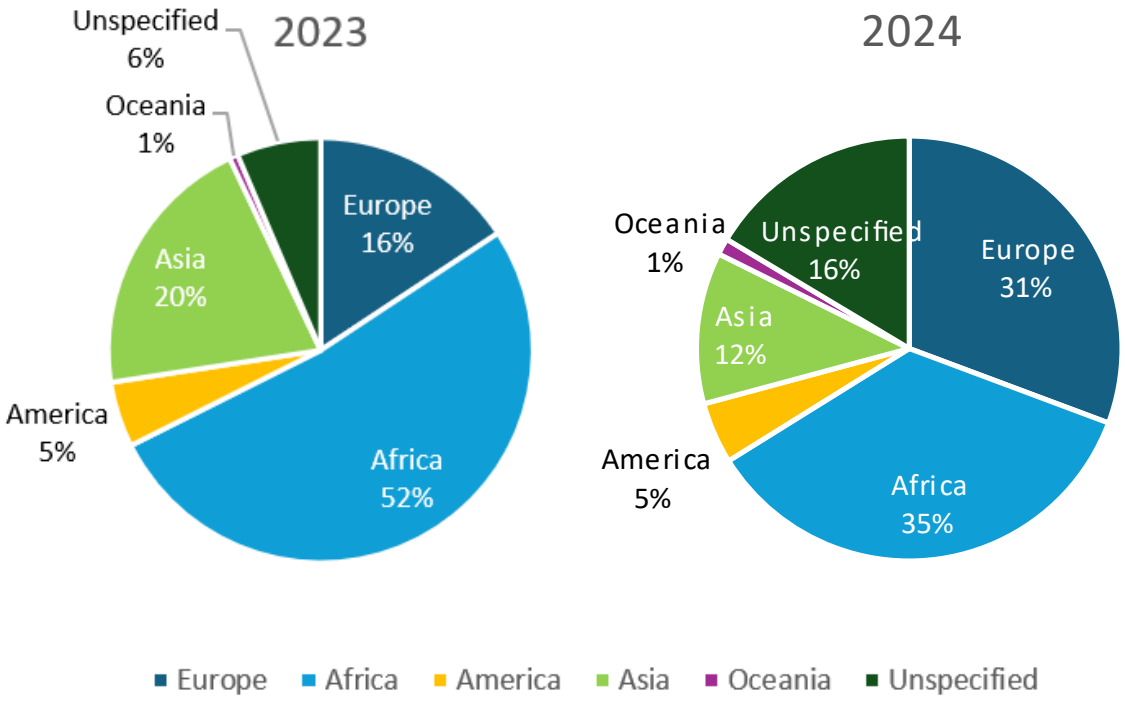
Table 24: Bilateral climate finance committed by the European Commission for mitigation, adaptation and cross-cutting by region, 2024

Region	Mitigation		Adaptation		Cross-cutting		Total		%
	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	
Europe	**0.97**	**1.05**	**0.01**	**0.01**	**0.41**	**0.45**	**1.40**	**1.51**	**31%**
Eastern Europe	0.60	0.64	-	-	0.02	0.02	0.62	0.67	
Southern Europe	0.08	0.09	0.00	0.00	0.05	0.06	0.14	0.15	
Europe, multiple	0.30	0.32	0.01	0.01	0.34	0.37	0.65	0.70	
Africa	**0.39**	**0.43**	**0.72**	**0.78**	**0.50**	**0.54**	**1.61**	**1.75**	**35%**
Norhtern Africa	0.13	0.14	0.03	0.04	- 0.00	- 0.00	0.16	0.18	
Eastern Africa	0.10	0.11	0.21	0.22	0.11	0.12	0.42	0.45	
Middle Africa	0.08	0.08	0.09	0.10	-	-	0.17	0.18	
Western Africa	0.06	0.06	0.14	0.15	0.09	0.10	0.29	0.31	
Southern Africa	0.01	0.01	-	-	-	-	0.01	0.01	
Africa, multiple	0.02	0.02	0.25	0.27	0.30	0.32	0.57	0.62	
America	**0.11**	**0.12**	**0.05**	**0.05**	**0.06**	**0.06**	**0.21**	**0.23**	**5%**
Central America	-	-	0.02	0.02	0.02	0.02	0.04	0.04	
South America	0.02	0.02	-	-	0.02	0.02	0.03	0.03	
Carribean	-	-	0.01	0.01	0.01	0.01	0.03	0.03	
America, multiple	0.09	0.10	0.01	0.01	0.01	0.01	0.12	0.13	
Asia	**0.15**	**0.17**	**0.29**	**0.32**	**0.08**	**0.08**	**0.53**	**0.57**	**12%**
Central Asia	0.01	0.01	0.02	0.03	0.01	0.01	0.04	0.05	
Eastern Asia	0.01	0.01	-	-	-	-	0.01	0.01	
South-eastern Asia	0.02	0.03	0.03	0.03	0.02	0.02	0.07	0.08	
Southern Asia	0.11	0.12	0.12	0.13	0.04	0.04	0.27	0.29	
Western Asia	0.00	0.00	-	-	-	-	0.00	0.00	
Asia, multiple	0.01	0.01	0.12	0.14	0.00	0.00	0.13	0.15	
Oceania	**0.02**	**0.02**	**0.04**	**0.04**	**0.00**	**0.00**	**0.06**	**0.06**	**1%**
Melanesia	-	-	0.02	0.02	0.00	0.00	0.02	0.02	
Micronesia	-	-	-	-	-	-	-	-	
Polynesia	-	-	0.00	0.00	-	-	0.00	0.00	
Oceania, multiple	0.02	0.02	0.02	0.02	0.00	0.00	0.04	0.04	
Unspecified	**0.44**	**0.48**	**0.11**	**0.12**	**0.20**	**0.22**	**0.75**	**0.81**	**16%**
Total	**2.09**	**2.26**	**1.22**	**1.32**	**1.25**	**1.35**	**4.56**	**4.93**	**100%**

Note: amounts for individual sub-regions may not add up to the total due to rounding. Percentages may not add up to 100% due to rounding. Countries are classified into regions according to the UN region classification.

Source: European Commission data.

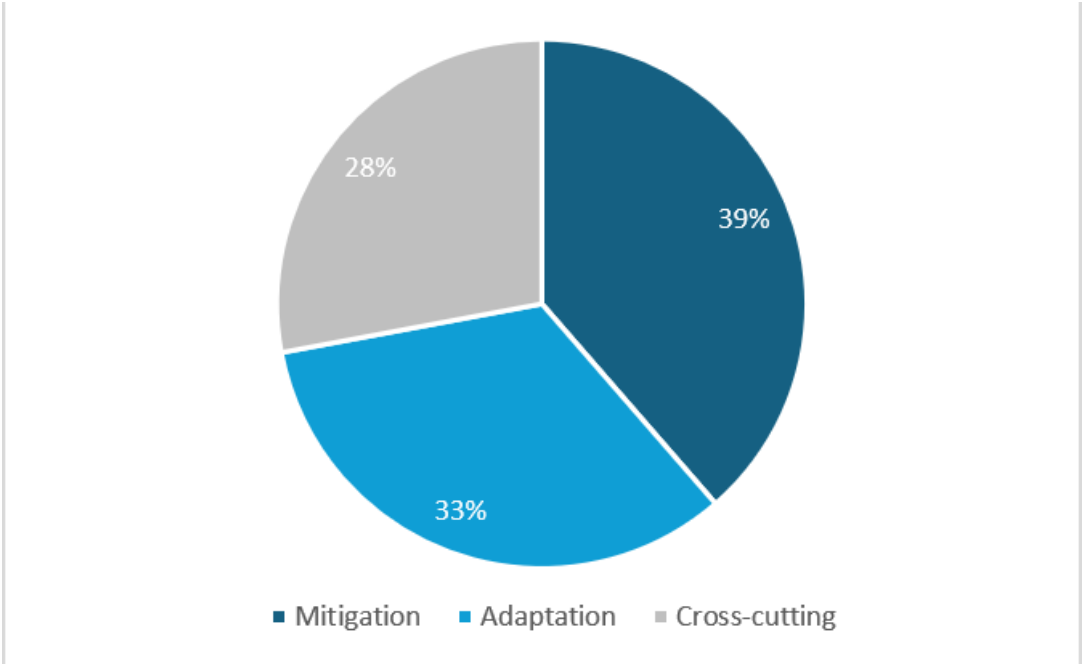
Figure 47: Geographical distribution of bilateral climate finance, 2023 and 2024



Note: Bilateral amounts are committed finance from the European Commission.

Source: Own illustration based on European Commission data.

Figure 48: Bilateral climate finance by type of support, 2023 and 2024



Note: bilateral amounts are committed finance from the European Commission.

Source: own illustration based on European Commission and EIB data.

5.3.2 *Multilateral financial support*

The EU and its Member States support a variety of global programmes and trust funds managed by multilateral organisations, including the UN Development Programme (UNDP), the UN Environment, the Food and Agriculture Organisation and the World Bank. The EIB channels significant volumes of climate finance to developing countries. The EIB funds reported here take the form of loans, equity investments, grants and other financial instruments. Since 2022, multilateral climate finance refers to finance *disbursed* by the EIB in the reporting year. Prior to 2022, reported multilateral finance referred to *committed* by the EIB.

Since the EIB is a multilateral development bank, all EIB financial support is categorised as multilateral. Only the EIB's climate-specific outflows are reported here.

The EIB contributed climate finance amounting to EUR 2.6 billion and EUR 2.4 billion, in 2023 and 2024 respectively. Total multilateral climate finance by type of support is provided in Table 25, which is based on the EIB's established procedure for tracking its climate finance.

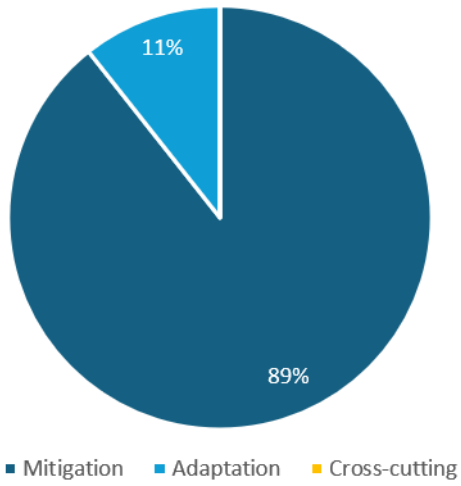
Table 25: Multilateral financial support (disbursement) by the EIB in 2023 and 2024

Year	Mitigation		Adaptation		Cross-cutting		Total	
	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn	EUR bn	USD bn
2023	2.41	2.61	0.18	0.20	-	-	2.60	2.81
2024	2.05	2.22	0.35	0.38	-	-	2.40	2.60
Total	**4.47**	**4.83**	**0.53**	**0.58**	**-**	**-**	**5.00**	**5.41**

Source: EIB data.

The majority of multilateral climate finance support was for climate change mitigation in 2023-24, as shown in Figure 49, with over 10% for climate change adaptation. The EIB attributes all climate finance to either climate change mitigation or adaptation, hence no financing for cross-cutting action is reported.

Figure 49: Multilateral climate finance by type of support



Note: Multilateral amounts are disbursed finance from the EIB.

Source: Own illustration based on EIB data.

Of all climate finance disbursed by the EIB in 2023, EUR 1.7 billion was channelled as ODA, while 651 million was channelled as OOF. Of all climate finance disbursed by the EIB in 2024, EUR 1.4 billion was channelled as ODA, while EUR 97 million was channelled as OOF. For the remaining amounts in both 2023 and 2024, this information is not available since these are either guarantees (which are not ODA eligible) or private sector loans or equity (which are not included by EIB in ODA reporting).

5.3.3 Mobilising financial support

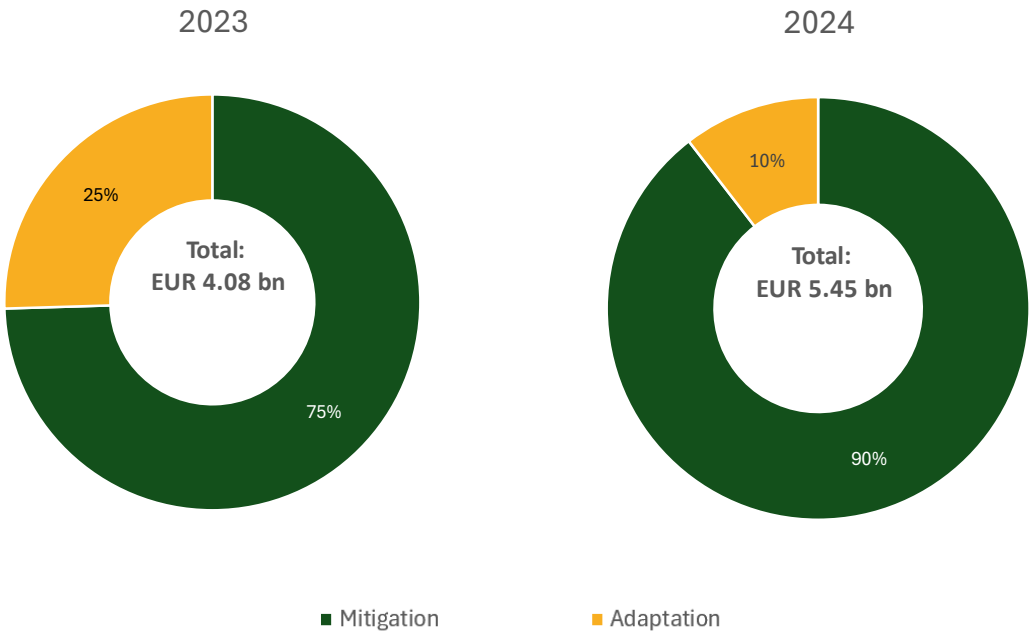
The EU is using innovative ways of engaging the private sector in **adaptation** and **mitigation** activities in developing countries. Private investment, alongside public investment, is seen as crucial to scaling up climate finance and closing current finance gaps. Although private investors show increasing interest in funding low-carbon investment, this potentially significant source of capital remains relatively untapped.

Attracting private investment in recipient countries is essential and especially challenging for adaptation finance. Therefore, efforts are also ongoing to promote the involvement of the private sector in climate action through the EFSD+. The EFSD+ provides a comprehensive set of tools including guarantees, grants and technical assistance, to mobilise private-sector investments for sustainable development in partner countries. It contributes, among others, to climate change mitigation, adaptation, environmental protection and management. Offering a variety of risk-sharing instruments of up to EUR 40 billion, the EFSD+ has the potential to mobilise over half a trillion euro in investments for 2021-2027, largely from the private sector.[99]

[99] EU Climate Action Progress Report 2025 - Climate Action.

Private financial support mobilised by the EIB in 2023 amounted to EUR 4.1 billion and in 2024 to EUR 5.5 billion, as shown in Figure 50. Resources used to mobilise private financial support amounted to EUR 4.0 billion in 2023 and EUR 1.7 billion in 2024.

Figure 50: Climate finance mobilised by the EIB, 2023 and 2024



Source: EIB data.

5.4 Support for technology development and transfer

Technology development and transfer is a key component of many development cooperation activities supported by the EU. Often support for technology development and transfer is one component of multi-purpose projects that target both mitigation and adaptation objectives. Separating out the portion of a financial flow that specifically supports technology development, and transfer is therefore not always possible. Section 5.5.1 below provides textual information on the EU's overarching strategic approach. Quantitative information on measures and activities related to support for technology development and transfer is provided in CTF Table III.4, which accompanies this BTR.

5.4.1 Strategies to support technology development and transfers

The EU supports the institutional framework for technology transfer created under the UNFCCC and is committed to its implementation. The European Commission is the largest contributor to the operations of the United Nations Climate Technology Centre and Network (CTCN), with total voluntary contributions of USD 19.6 million[100] since 2014. This funding supports the CTCN's mandate to provide technical assistance to

[100] As of 15 October 2023, see page 63 of the UN CTCN (2023) 2022-2023 CTCN Progress Report https://www.ctc-n.org/file-download/download/public/38659.

step up technology transfers to developing countries. The European Union and its Member States have invested in CTCN and its country-driven business model, trusting in its capacity to deliver a portfolio of technology and innovative solutions, knowledge transfer and advice on policy, legal and regulatory frameworks tailored to the needs of individual countries. In the reporting years of 2023 and 2024, the European Commission had two running grants to the CTCN of a total value of EUR 5 million, linked to implementation of 17 CTCN technical assistance requests for ten projects in communities at risk of conflict.[101, 102]

The EU and the CTCN cooperate on the programme 'Climate Change and Security: Innovative Community-based Climate Technology for Communities at Risks of Conflicts Due to Climate Impact'. The aim of this programme is to strengthen the resilience of communities in conflict due to climate impacts by promoting conflict-sensitive, community-based technological solutions to climate change.

To receive support under the programme, projects were required to support new or improved technologies, demonstrate scalability and promote inclusive outcomes, including action to empower women and girls. Eligible technologies included both hard and soft technologies, as well as technologies requiring market expansions, improved financial viability, or measures to overcome policy and market barriers.

The programme was launched in 2023 and had a budget of EUR 3 million over three years, managed by the CTCN. Resources were made available on request for assistance from National Designated Entities in countries at risk of conflict.

The second ongoing CTCN project is the Innovative Climate Solutions (ICS) programme. The programme aims to connect innovative climate solutions with countries' needs for transformative and inclusive climate action. It comprises eight technical assistance activities, of which seven are fully funded by the ICS programme and one is co-funded by the CTCN. With a total budget of approximately EUR 2 million, the programme also offers an opportunity to contribute to the Global Renewables and Energy Efficiency Pledge agreed at COP28. In 2026, the European Commission is exploring options to provide limited follow-up support for three selected ICS projects to facilitate their further development and continuity.

5.4.2 Support provided at different stages of the technology cycle

EU programmes and initiatives target different stages of the technology cycle, which can be divided into four key stages: research and development, growth, maturity and decline. EU programmes and initiatives support technology development and transfer across these stages.

[101] Climate Change and Security: a Joint EU-CTCN programme for Innovative Community-based Climate Technology for Communities at Risks of Conflicts, https://www.ctc-n.org/news/climate-change-and-security-joint-eu-ctcn-programme.

[102] Walking the talk: EU's Latest EUR 2 million Grant Bolsters Technology for Climate Action via CTCN, https://www.ctc-n.org/EuropeanUnion_Latest_Grant_Bolsters_Technology_for_Climate_Action.

Research and development stage

The EU's key funding programme for research and innovation is Horizon Europe, with a budget of EUR 95.5 billion over the 2021-2027 period. The programme has a target to allocate 35% of the budget to climate expenditure, representing a total investment of EUR 33.4 billion. Though it is focused on the EU, international cooperation is a key pillar of the programme, through bilateral science and technology agreements with individual countries. These agreements aim to increase cooperation in research and innovation. In addition, the EU maintains regional science and technology cooperation dialogues with many regions around the world. The African Union – European Union High Level Policy Dialogue on Science, Technology and Innovation, for example, sets long-term research and innovation policy priorities to strengthen cooperation between Africa and Europe.

Growth stage

Development of Smart Innovation through Research in Agriculture (DeSIRA) is an initiative aimed at contributing to a climate-relevant, productive and sustainable transformation of agriculture and food systems in low- and middle-income countries. Alongside a research component, the initiative also supports projects that test and scale up innovative technologies for sustainable development and resilient production in crop and livestock farming.

An example is the 'Soil Matters – Innovations for Soil Health and Agroecology' project in Africa and India. It supports co-development, dissemination and scaling by farmer organisations, public and private extension services and input providers in cooperation with national and international research institutes, of site-adapted innovations such as Integrated Soil and Fertility Management, conservation agriculture, holistic pasture management and fodder production plots, agroforestry, on-farm biomass and nutrient cycles, off-farm production of organic and bio-fertilisers. The project takes an evidence-based multi-stakeholder approach that feeds into the set-up of national Africa Fertiliser and Soil Health Summit (AFSHS) 10-year action plans and into continental and multilateral policy dialogues and processes (AFSHS, UN Convention to Combat Desertification (UNCCD), UNFCCC, UN Convention on Biological Diversity etc.). Implemented by the German Agency for International Cooperation (GIZ), the project runs from 2025 to 2028 and is a multi-donor action supported by the EU with EUR 10 million, and by the German Federal Ministry for Economic Cooperation and Development (BMZ) with EUR 16.2 million.

Another example of an EU-supported initiative that focuses on supporting the growth phase of adaptation technologies is the Climate Resilience and Adaptation Finance and Technology Transfer Facility (CRAFT). The facility, implemented by The Lightsmith Group, will make growth equity investments in selected private companies proposing climate resilience solutions. This includes companies offering services and products related to weather analytics, agricultural analytics, catastrophe risk modelling and distributed water solutions. At least two thirds of CRAFT investments will go to developing countries. The EIB will contribute funding of around EUR 24 million over several years.

Maturity stage

The EU supports many projects that focus on making widely used and increasingly standardised technologies, such as photovoltaics, more efficient by supporting measures that reduce the cost of deploying them. The deployment of wind and solar needs to grow rapidly in order to meet the temperature target set under the Paris Agreement. The technologies are mature, and interventions now need to focus on deploying them more efficiently instead of investing in new innovations.

An example of a project that focuses on cost reduction is the AFRIGREEN Debt Impact Fund. This fund offers long-term debt solutions for financing solar infrastructure projects in Central and West Africa through direct loans and asset-based credit facilities. It takes a two-pronged approach which focuses on helping African small and medium-sized enterprises reduce their energy costs and on expanding the use of photovoltaics in Africa. Projects funded by AFRIGREEN include a USD 15 million senior debt facility for building photovoltaic plants in Nigeria[103]. The EIB will contribute funding to AFRIGREEN of some EUR 25 million over several years.

Decline stage

In the decline stage, technologies become obsolete or are replaced by other, more innovative technologies. In line with current policies, the EU does not support projects that seek to maintain or extend the use of technologies that have become obsolete or are being replaced by more sustainable alternatives.

5.4.3 Support for development and enhancement of endogenous capacities and technologies'

According to the CTCN, endogenous technologies refer to 'new technologies developed within (or based on the initiative of) a country through research, development and demonstration'. It further refers to technologies acquired through understanding, adapting, utilising and replicating already existing technologies[104].

Several EU-funded projects focus on supporting country-driven innovation and solutions that enhance endogenous capacities and technologies of developing countries. An example is the Farmers Organisations Leading Research and Innovation on Agroecology for Sustainable Food Systems (FO-RI) project, implemented under the DeSIRA initiative, which supports 13 action-research partnerships across Africa, Asia, Pacific Island Countries, the Caribbean and Latin America. These partnerships are led by farmer organisations, with technical support from agricultural agencies and research bodies, and focus on designing, testing and disseminating innovations based on agroecological principles. Started in January 2022, the project had trained more than 23 548 farmers by December 2024.

[103] Invest Afrigreen debt impact fund – our projects, https://www.rgreeninvest.com/en/afrigreen/afrigreen-debt-impact-fund-portfolio/.

[104] See the CTCN definition here: https://www.ctc-n.org/technology-sectors/endogenous-technologies?page=33.

Capacity development for farmers focuses on participation in research and peer-to-peer learning processes on agroecology. As per the AgriCord approach, peer-to-peer learning events play a central role in supporting innovation by encouraging collaboration, knowledge exchange and joint problem-solving among farmers, researchers and other stakeholders. By drawing on shared experience within communities, this approach facilitates the uptake and adaptation of new practices.

In 2024, all 13 action-research projects contributed to reaching smallholder farmers by empowering them to jointly conduct inclusive action research and disseminate knowledge on agroecology. Activities included training on vegetable seeds, action-research protocols, joint experiment design and implementation, and good agricultural practices, delivered through on-site sessions, indoor meetings and online formats. In Burkina Faso, the FO-RI project supports farmer-led research and innovation based on endogenous knowledge to develop agroecological solutions for the onion value chain, in collaboration with national research institutions, including INERA and IRSAT.

Efforts to encourage private sector activities related to technology development and transfers'

Many projects supported by EU institutions attract additional private-sector investment in technologies such as renewable energy or climate-smart agriculture. The EU encourages private-sector activities related to technology development and transfer primarily through its Global Gateway strategy, which mobilises sustainable public and private investment under a Team Europe approach. By combining investment with technical assistance, capacity building, policy dialogue and enabling regulatory frameworks, the Global Gateway supports the deployment and uptake of climate technologies in partner countries while strengthening local skills and capacities and contributing to action to implement the Paris Agreement.

For example, in line with the Global Gateway Investment Agenda, EIB Global has provided a USD 300 million local currency loan to Enel Colombia to support renewable energy generation and to modernise the country's electricity distribution network. The loan, which is backed by an Italian Export Credit Agency (SACE) guarantee, will support the development of the Guayepo I and II solar photovoltaic plants, with a combined capacity of approximately 486 MW. It will also help finance upgrades to the electricity grid that serves more than 3.7 million customers in Bogotá.

Other examples below illustrate how selected EU-supported initiatives contribute to technology development and transfer. They are provided for illustrative purposes only and are not an exhaustive list.

Just Energy Transition Partnerships (JETPs) – Vietnam, Indonesia, Senegal and South Africa

The EU supports technology development and transfer through JETPs with Vietnam (2022), Indonesia, Senegal (2023) and South Africa (2021). These partnerships combine public finance, technical assistance and capacity building to support the deployment of

renewable energy, electricity grids, energy storage and other clean energy technologies. They also help mobilise private investment in partner countries in support of nationally determined energy transition objectives.

Global Gateway Flagship – Transfer of Innovative Polish Biogas Technology to the Agricultural Sector in Kenya and Rwanda

This Team Europe flagship initiative supports the transfer and adaptation of Polish biogas technology to local conditions in Kenya and Rwanda. Activities include pilot projects, technical cooperation and training on the operation and maintenance of biogas plants, supporting the uptake of clean energy technologies and strengthening local technical capacities.

Team Europe Initiative – Green Deal: Sustainable Investment and Recovery in Brazil

This Team Europe initiative supports renewable energy and circular economy solutions, including access to finance for solar energy investments and the commercialisation of green, low-carbon technologies from European companies. This initiative aims to facilitate the transfer of innovative, sustainable technologies and promote their adoption in these countries, contributing to a reduction in GHG emissions and helping to build a more sustainable energy future.

Team Europe Initiative – EU–Guatemala: fostering the green transition in Petén

This Team Europe initiative supports the green transition in Guatemala's Petén region by strengthening local institutions and promoting sustainable forest management, climate-resilient agriculture, sustainable tourism, and improved waste and water management. The initiative supports technology transfer by setting up three centres for agroecological innovation dedicated to the transfer of climate change adaptation and mitigation technologies. It also helps build local capacities, contributes to climate resilience and to meeting the objectives of the Paris Agreement.

Global Gateway Flagship – Africa–EU Space partnership programme

This Global Gateway flagship initiative leverages the EU's space programme and its ecosystem, including Copernicus and European meteorological satellite systems, to support the use of new technologies, data and knowledge transfer in Africa. Built around space cooperation, Earth observation-based environmental services and support for the African private sector, the programme promotes the uptake of space technologies and climate services, for example to feed into early warning systems, thereby strengthening climate resilience and supporting the objectives of the Paris Agreement. Fostering private-sector engagement and strengthening the capacity and skills of private-sector bodies also form part of the programme's three components.[105]

5.4.4 Efforts to step up, encourage and boost innovation

Collaboration and multi-stakeholder approaches are an important part of many projects supported by the EU. These approaches are guided at an overarching level by

[105] Africa–EU Space Partnership programme - International Partnerships

the 2021 Commission communication on the Global Approach to Research and Innovation[106]. It commits the EU to promoting rules-based multilateralism, keeping research and Innovation open on a reciprocal basis to facilitate global responses to global challenges, and exchanging best practices.

Several projects supported by the EU include specific components that focus on engagement with stakeholders, the co-creation of knowledge and building partnerships at local, regional, national and international levels to enable and boost innovation and collaborative approaches to research and development. The DeSIRA/DeSIRA+ initiative, described in detail in Section 5.5.6, is one example. Under the DeSIRA/ DeSIRA+ initiative, strong partnerships between multiple stakeholders, openness among farmers to new ways of working, and private-sector engagement are also key for translating knowledge into action and fostering innovation.

5.4.5 Generating knowledge

Many EU-supported projects generate knowledge and evidence that are synthesised and disseminated to facilitate learning and support the replication of successful approaches. The DeSIRA/DeSIRA+ initiative is an example of this; it includes a specific strand for capturing and making accessible knowledge and evidence generated during the implementation of the initiative's projects. This strand, first covered by DeSIRA – Leveraging the Impact of Food Security and Nutrition (DeSIRA-LIFT) for the period from 2021 to 2024, and then by DeSIRA-LIFT+ from 2026 to 2028, focuses on knowledge co-production and strengthening innovation capacity. It uses a three-pronged approach that focuses on the local, institutional and policy levels, as described below[107]:

- providing tailored services and expert support in response to identified needs, while generating actionable and cross-cutting knowledge that supports capacity strengthening, knowledge sharing, mutual learning, partnership building, collaboration across projects and the development of synthesis studies and other knowledge products;
- strengthening evidence-based policy dialogue at continental, regional and national levels, to take up knowledge and experience generated in DeSIRA projects and beyond;
- fostering structured dialogue among project implementers, African partner organisations and policymakers to strengthen the policy environment for research and innovation in food systems, focusing on the African Union-EU relationship.

The EU has supported DeSIRA-LIFT with a total contribution of EUR 6.5 million and is supporting DeSIRA-LIFT+ with a total contribution of EUR 3 million. The knowledge briefs and updates are provided through a dedicated platform. This helps to make

[106] Communication from the Commission on the Global Approach to Research and Innovation, COM(2021) 252 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A252%3AFIN.

[107] Leveraging the DeSIRA initiative for agri-food systems transformation, https://capacity4dev.europa.eu/library/communication-global-monitoring-and-evaluation-framework-desira_en.

research findings and the lessons learnt accessible to a wider audience and supports the replication of successful approaches[108].

5.4.6 Gender Action Plan in support for and technology transfer to third countries

The EU and its Member States promote women's equal participation and leadership in international climate negotiations and governance, as well as in policymaking.

The EU framework for external action is set by the EU's gender action plans (GAP). GAP II covered the 2016-2020 period, while GAP III ran from 2021 to 2025 and was extended to 2027. GAP. It provides a framework for integrating gender considerations across all external policies and sectors, including development cooperation, neighbourhood policy, humanitarian contexts and foreign policy engagement. GAP III aims to make gender equality a priority through a three-pronged approach combining gender mainstreaming, targeted actions and political dialogue. Its objective is that at least 85% of all new EU external actions contribute to gender equality and women's empowerment by 2025, while promoting progress in areas such as women's participation and leadership, economic and social rights, gender-based violence and the Women, Peace and Security agenda.

The GAP also extended gender mainstreaming to emerging policy areas such as the green transition, requiring sectors including energy, agriculture, infrastructure and climate-related activities to integrate a gender perspective. In this area, GAP III contributes to a more inclusive green transition by reducing women's health risks and workloads, improving access to essential resources such as water and energy, increasing women's participation in sustainable agriculture and climate-related activities, and strengthening women's skills, income, resilience to climate change and decision-making power[109]. In Bangladesh, this approach is illustrated by the Shoktikonna 'Power Women' initiative, a flagship measure under country-level implementation plan, which supports young female graduates in science, technology, engineering and mathematics (STEM) in accessing employment in the green energy sector. By providing technical expertise, mentorship and professional networks, the initiative facilitates women's entry and progression in sustainable industries, including green energy, thereby contributing to greater female participation in the deployment and uptake of climate-relevant technologies and in the broader green transition.

GAP III is being implemented through a policy-driven, context-specific approach based on gender country profiles. This has led to 131 country-level implementation plans[110]. The initiative is also being integrated into key external action instruments such as the Instrument for Pre-Accession Assistance (IPA) III, NDICI and the Common Foreign and Security Policy, and has also helped mainstream gender in the Global Gateway strategy

[108] DeSIRA Lift – Resources, https://www.desiralift.org/resources/DeSIRA | Capacity4dev

[109] Intermediate Evaluation of the implementation of the EU's Gender Action Plan III (2021-2027) - International Partnerships

[110] Joint mid-term report on the implementation of the EU Gender Action Plan (GAP III)

and Team Europe Initiatives. In Bangladesh, for example, a Team Europe initiative on green energy transition has helped female STEM graduates access jobs in utility companies and the renewable energy sector, while consultations with women's organisations and evidence from the Women's Engagement in Green Energy study has informed policy and regulatory reforms[111].

For evaluation, GAP III applies the DAC gender equality scoring system to each action: 'significant' (marked 1) means that gender equality is an important objective, but not the principal reason for undertaking the action, while 'principal' (marked 2) means that gender equality is the main objective. The intermediate evaluation of GAP III shows both that progress has been made and gaps remain in the green transition area: between 2021 and 2024, 287 EU actions were identified in the green sector, 89% of them with gender equality as a principal or significant objective, while EUR 6.7 billion was committed to green actions over in the 2021-2024 period.

Internationally, GAP III has been a crucial platform for dialogue in a challenging global context. At multilateral level, the EU and its Member States have actively driven the adoption of resolutions and worked with the United Nations to combat violence against women, has contributed to the UN's Commission on the Status of Women and has promoted gender perspectives in climate and digital decision-making[112]. To continue promoting gender mainstreaming across all EU policies, including in cross-cutting areas such as climate and environmental policies, the Commission will also further build on progress made by the Task Force on Equality with the network of equality coordinators in all Directorates-General and services and in the European External Action Service[113].

5.5 Capacity-building support

5.5.1 Strategies employed to provide capacity-building support

The EU has mainstreamed capacity-building activities into all development assistance, in line with the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action. The EU's development activities in the field of climate change are based on the principles of national ownership, stakeholder participation, country-driven demand, cooperation between donors and across programmes, and impact assessment and monitoring.

The following case studies are examples of capacity-building support provided by the EU.

The Commission's Green Deal Knowledge Hub, a group of technical assistance facilities designed to support the external dimension of the European Green Deal and the Agenda 2030 for Sustainable Development across partner countries, including climate-resilient

[111] Intermediate Evaluation of the implementation of the EU's Gender Action Plan III (2021-2027) - International Partnerships

[112] Ibid.

[113] Ibid.

and sustainable energy development. Facilities under the hub include the Biodiversity for Life Facility, the EU Greening Facility, the Forest for the Future Facility, the Climate Facility, the Technical Assistance Facility for Sustainable Energy, the Switch to Green Facility and the Water Facility.

- **Greening Facility**

The Greening Facility helps in building knowledge and capacities for integrating the environment and climate change into external action. It provides guidance on how to identify and maximise opportunities for programmes and projects to contribute to climate and environmental objectives and ensure compliance with the 'do no harm' principle. It offers remote and on-site assistance to EU staff and national partners to build capacities and increase knowledge among all stakeholders. The Greening Facility also provides quality control of the Rio markers for EU international cooperation actions, to ensure consistent and correct use of the eligibility criteria, rules and guidance established by the OECD DAC.

- **EU Climate Facility – formerly the EU Global Support Facility for Nationally Determined Contributions**

The EU Climate Facility – formerly the EU Global Support Facility for Nationally Determined Contributions – supports the integration of climate change into EU development cooperation. On a demand-driven basis, it supports EU delegations in delivering policy advice, building capacity and providing technical assistance to partner countries for designing, updating and implementing NDCs and broader climate strategies and programmes. It also supports the climate-proofing of investment, climate resilient infrastructure, and finance, knowledge and decision-making.

Since October 2021 the Facility has supported 18 partner countries in designing and/or implementing their NDCs, 11 in sub-Saharan Africa, three in Asia and the Pacific, and four in Latin America and the Caribbean. In the Philippines, for instance, it supported the 2025 NDC update with a systematic assessment of the adaptation co-benefits, risks, and trade-offs of mitigation measures across six priority sectors. This promoted adaptation–mitigation synergies in national planning. This activity has been complemented by multi-country and global work including the Team Europe initiative on climate change adaptation and resilience in Africa, and the use of Earth observation and climate-risk data to inform resilient planning and infrastructure design. In 2026, the Facility continues to provide NDC-related support in the Democratic Republic of the Congo, Nigeria, Liberia, Peru and Zambia, among other assignments.

Euroclima

The Euroclima programme seeks to contribute to a green and just transition in the Latin America and Caribbean (LAC) region[114]. Euroclima has been the EU's flagship regional

[114] Euroclima Annual Report 2025: Progress, Experiences and Lessons from Implementation | Capacity4dev

programme on climate action in Latin America since 2010. In 2023 it expanded to the Caribbean and it is now being implemented in all 33 LAC countries.

The programme aims to reduce the impact of climate change in the LAC countries by promoting mitigation of and adaptation to climate change and promoting resilience, investment and biodiversity. It assists in the transition of Latin American and Caribbean countries to a decarbonised, environmentally friendly and inclusive economy, helping to ensure a socially just and green recovery in line with the EU Green Deal.

From 2017 to mid-2026, 286 capacity-building processes were carried out with the support of the programme. This resulted in the training of over 90 000 individuals (44% of whom are women) in many areas linked to climate change.

EU4Climate

The EU4Climate project, which concluded in December 2023, provided strong and stable support to the Eastern Partnership (EaP) countries in formulating ambitious climate policies and legislation from 2018. The EaP countries are highly exposed to the impacts of climate change and regularly have to contend with heat stress, droughts, floods and landslides, with an annual temperature increase surpassing the global average and a significant decrease in precipitation. Climate change impacts are affecting all economic sectors, particularly energy infrastructure, agriculture, human health, water resources, forestry and tourism. All of these make ambitious climate action more urgent than ever. Under the project, the EU and UNDP worked in close collaboration to increase the policy ambition of the EaP countries in fighting climate change. It was financed by EUR 8 million from the EU and co-financing of EUR 800 000 from the UNDP. In response to the requirements of the Paris Agreement, EU4Climate assisted Georgia, Armenia and Azerbaijan in preparing their long-term low greenhouse gas emission development strategies (LT-LEDS). Moldova was supported in developing the updated LEDS for 2030 and carrying out a stakeholder consultation. Ukraine had already prepared its long-term strategy before the start of the project. The monitoring, reporting, and verification (MRV) of GHG emissions is a crucial activity in the fight against climate change. MRV refers MRV refers to the methods countries use to track their greenhouse gas emissions, the actions they take to reduce them. The project made good progress in developing national inventory systems and MRV approaches. Armenia, Azerbaijan, Georgia and Moldova customised their MRV systems based on their own needs and on feedback from stakeholders. Armenia, Azerbaijan, Georgia, Moldova and Ukraine carried out 17 sectoral mainstreaming studies dealing with energy, agriculture, LULUCF, transport, health, gender, waste and water. Ukraine has adopted an environmental security and climate adaptation strategy covering the period to 2030[115].

[115] 2024 annual report on the implementation of the European Union's external action instruments in 2023 - Publications Office of the EU

Twinning and TAIEX

The Twinning and Technical Assistance and Information Exchange (TAIEX) instruments facilitate institutional capacity building in a 'Team Europe' approach that involves sharing EU best practices through peer-to-peer exchanges supporting reform in partner countries. These short- and medium-term projects typically involve workshops, training sessions, expert missions and study visits, all of which are designed to promote long-term reform processes. Harnessing experience gained over more than 30 years in neighbourhood countries and countries preparing to join the EU, since 2020 Twinning and TAIEX have also been made available to countries in Sub-Saharan Africa, the Middle East, Asia and the Pacific, the Americas and the Caribbean, and Overseas Countries and Territories. These two tools contribute to strengthening partner countries' national and regional policies, support the implementation of the Sustainable Development Goals, and contribute to the Global Gateway strategy.

AdaptAction – Advancing Climate Adaptation in the Southern Mediterranean (ACA-MED)

Through the AdaptAction ACA-MED programme (running from 2023 to 2028) the European Commission is supporting climate adaptation and resilience in Mediterranean partner countries[116]. AdaptAction ACA-MED is being implemented in Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Palestine and Tunisia. The project's total budget is about EUR 6 million, with additional co-funding from the French development agency, AFD. AdaptAction ACA-MED supports climate objectives through funding for vulnerability and risk assessments, national and local adaptation planning, institutional capacity-building and pilot adaptation measures. More specifically, one of its objectives is to improve national capacities for climate adaptation, particularly by effectively integrating adaptation into sectoral policies, action plans and governance instruments.

5.5.2 Responding to existing and emerging capacity-building needs

The EU's capacity-building support is grounded in the principle of national ownership. This means that the beneficiaries have ownership over their capacity building, as they independently assess their capacity needs, priorities and gaps and design and manage the process of change. External partners like the EU only provide support. Consequently, capacity-building activities are demand-driven, typically arising from donor cooperation and cross-programme collaboration, and promote the participation of relevant stakeholders.

To achieve a better understanding of the challenges faced by partner countries, the EU uses its external policy instruments, including high-level dialogues, green alliances and green partnerships, policy and political dialogues, Just Energy Transition partnerships and climate dialogues. This work is carried out by or in

[116] AdaptAction - Advancing Climate Adaptation in the Southern Mediterranean - EU Medbridge

collaboration with the EU delegations and offices that represent the EU in 144 non-EU countries and help implement climate programmes around the world.

Since EU support is provided in response to partner countries, information from the partner countries (for instance through their national communications) is important in order to assess their capacity-building needs and the effectiveness of ongoing activities.

EU Climate Dialogues 2

In 2025, EU Climate Dialogues 2 (EUCDs2) contributed to strengthening partner countries' capacities to advance climate mitigation and resilience through targeted climate diplomacy and policy dialogue. Activities included a dedicated MRV roundtable in Nigeria supporting NDC implementation and Article 6 readiness; high-level dialogues in South Africa during Green Diplomacy Week focused on operationalising 2035 NDC pathways; and EU–China exchanges on coal-mine methane mitigation and resilience finance. In parallel, the EU carbon pricing study and exchange tour engaged representatives from Brazil, Chile, Colombia and Kazakhstan to support the design and implementation of carbon pricing instruments. Collectively, these activities enhanced institutional capacities, informed policy frameworks and laid the groundwork for scalable climate action.

5.5.3 Policies promoting capacity-building support

The EU supports capacity building in partner countries through regulations, strategies, policies and programmes. Some key examples are presented below.

Neighbourhood, Development and International Cooperation Instrument – Global Europe

The Regulation establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI-Global Europe Regulation[117]) aims to foster dialogue and cooperation with third countries and regions in the European Neighbourhood, Sub-Saharan Africa, Asia and the Pacific, and the Americas and the Caribbean.

The Regulation explicitly mentions capacity building relating to environment and climate change as areas of cooperation across all geographic regions. Specific areas for cooperation under the NDICI's Global Challenges priority area 'Planet' include the following:

- strengthening scientific, technical, human and institutional capacity for climate and environmental management, mainstreaming and monitoring. This includes enhancing regional, national and local climate and environmental governance and facilitating access to public and private resources for disaster risk reduction, ecosystem and biodiversity conservation, climate finance and insurance;

[117] Regulation (EU) 2021/947 stablishing the Neighbourhood, Development and International Cooperation Instrument https://eur-lex.europa.eu/eli/reg/2021/947/oj/eng

- integrating environmental sustainability and climate change objectives into national and local development strategies, also in terms of including sustainability criteria in public procurement.

NDICI-Global Europe also emphasises the importance of empowering civil society organisations and local communities, in particular women's and youth organisations.

EU Global Gateway strategy

The EU Global Gateway is the EU's comprehensive strategy to promote large-scale investment in partner countries. It aims to boost smart, clean and secure investment in physical sustainable infrastructure in the areas of digital, climate mitigation and adaptation, energy and transport. It also promotes enabling operating environments, including regulatory frameworks and investment in people in areas such as education, research and health. Since its inception in late 2021, the Global Gateway has provided investments at scale: Team Europe mobilised EUR 306 billion between 2021 and 2024, reaching the EUR 300 billion target two years ahead of schedule. Now the EU aims to exceed EUR 400 billion in Global Gateway investments by 2027. Climate and energy are at the core of the Global Gateway strategy: of the 256 flagship projects endorsed in December 2025, 129 focus on this area, constituting more than 50% of the overall portfolio.

The Global Gateway's 'green and clean' principle reflects the EU's commitment to supporting partner countries in their green transition. Accordingly, no measures will be supported if they are incompatible with beneficiary countries' NDCs under the Paris Agreement, promote investments in fossil fuels, or risk having significant adverse effects on the environment or the climate. All proposed investments are subject to environmental and climate risk screening. Through this approach, the EU aims to promote inclusive growth and job creation by investing in infrastructure that is clean, climate-resilient and aligned with pathways towards net-zero emissions. Under the Global Gateway's 360-degree approach, interventions should integrate environmental, climate and biodiversity considerations throughout and be accompanied by support for the enabling environment, including the promotion of high ESG standards.

These policies and programmes demonstrate the EU's commitment to building capacities in partner countries across various sectors, with a particular focus on climate change, while at the same time promoting stability, development and mutual cooperation.

Samoa Agreement

The Samoa Agreement is the modernised partnership framework for relations between the EU, its Member States and the members of the Organisation of African, Caribbean and Pacific States. It aims to strengthen the capacity of the EU and African, Caribbean and Pacific (ACP) countries to address global challenges together and sets out shared priorities for cooperation, including environmental sustainability, climate change, sustainable development and human and social development. The Samoa Agreement

succeeds the Cotonou Agreement and will serve as the legal framework for EU relations with 77 countries over the next 20 years.

European Fund for Sustainable Development Plus (EFSD+)

Under NDICI-Global Europe, the European Fund for Sustainable Development Plus (EFSD+) is one of the financing tools backing the Global Gateway, promoting sustainable investment in the EU's partner countries. Offering a variety of risk-sharing instruments of up to EUR 40 billion, the EFSD+ aims to mobilise up to EUR 135 billion of public and private financing to help partner countries achieve the SDGs. Support provided through the ESDF+ may also include technical assistance and complementary measures, including institutional and capacity-building support where relevant.

Capacity building in EU candidate countries

It is worth mentioning that institutional capacity building is a crucial part of the Commission's actions to support candidate and potential candidate countries in their efforts to modernise their public administrations in preparation for joining the EU. Consequently, the EU has been published a guidance document on better addressing capacity building in interventions at the planning/programming, monitoring and evaluation stages. These interventions target both public institutions and non-state operators, including the private sector and civil society organisations[118].

5.5.4 Involving stakeholders

The NDICI-Global Europe Regulation lays out the general principles for projects implemented under the instrument. This includes the principle of inclusive partnership and transparency, which requires the Commission to ensure that relevant stakeholders in partner countries, including civil society organisations and local authorities, are duly consulted and have timely access to relevant information. The aim is to actively involve them so they can play a meaningful role in the design, implementation and monitoring of programmes funded through the instrument. The Regulation further provides that, in line with the principle of ownership, the Commission should favour the use of partner countries' institutions and systems for the implementation of programmes.

These general principles are further applied through regular and inclusive multi-stakeholder dialogues with other donors and other relevant actors, including local authorities, representatives of civil society, foundations and the private sector.

The following projects illustrate how stakeholders are involved in EU-funded projects.

Global Gateway flagship project: Turning the Tide – sustainable practices and economic opportunities for sargassum value chain development in the Caribbean Basin

[118] Addressing capacity development in planning/programming, monitoring and evaluation, https://neighbourhood-enlargement.ec.europa.eu/system/files/2018-10/dg_near_guidance_note_-_addressing_capacity_development_in_programming_me.pdf.

This initiative aims to drive commercially viable sargassum transformation in the Caribbean, creating jobs and promoting economic growth while building a sustainable sargassum value chain. The project advances research to enable evidence-based action, strengthens local capacities, policy frameworks and regulations, and develops proof of concept for commercial-scale transformation. Stakeholder involvement is promoted through regional multi-stakeholder dialogue and through expression-of-interest processes that match local needs with private sector and research-based innovations.

Intra-ACP climate services and related applications – CLIMSA

The Intra-ACP Climate Services and Related Applications programme aims to foster sustainable development by improving climate and disaster resilience through the strengthening of the climate services value chain. The programme supports access to climate information, the generation and provision of climate services through regional climate centres, and development of these centres' capacities. The programme brings together users, researchers and climate service providers through structured interaction, and supports climate-informed decision-making and the mainstreaming of climate services into policy processes at regional and national levels.

Global Gateway flagship project: NaturAfrica

NaturAfrica is an EU Global Gateway flagship project that supports biodiversity conservation and socio-economic development while enhancing climate adaptation and sustainable landscape management. Its approach is based on conservation and sustainable economic development and governance, and it includes support for the inclusive management of natural resources, ecotourism, renewable energy and sustainable value chains. These actions promote livelihoods, employment opportunities, food security and climate resilience among local populations, including women and young people. They facilitate interactions among researchers, protected area managers, local authorities and civil society at the local level, as well as with national authorities, regional institutions and donors at a broader level.

Global Gateway flagship project: Kiwa Initiative – strengthening the climate resilience of Pacific Island ecosystems, economies and communities

The Kiwa Initiative aims to strengthen the climate resilience of Pacific Island ecosystems, economies and communities by promoting and supporting nature-based solutions. The initiative supports climate change adaptation through the protection, sustainable management and restoration of biodiversity, and facilitates access to adaptation and nature-based solutions funding. National and local authorities, civil society, NGOs and regional organisations are supported through improved access to climate adaptation and nature-based solutions funding.

Transition towards a low-emission and climate-resilient economy in the Western Balkans and Türkiye (TRATOLOW)

The TRATOLOW project is an example of how stakeholders are involved in EU-funded projects. The project's objective is to contribute to climate change mitigation and adaptation in the Western Balkan region and Turkey and to help those countries move

towards resource-efficient, low-emission and climate-resilient economies. The project focuses on strengthening institutional capacities and cooperation and on involving stakeholders, in line with the principle of stakeholder ownership.

5.5.5 Sharing lessons learnt and best practices

The Commission's Directorate-General for International Partnerships (DG INTPA) is responsible for formulating the EU's international partnership and development policy, with the ultimate goal of reducing poverty, ensuring sustainable development, and promoting democracy, human rights and the rule of law across the world. DG INTPA strives to be a learning organisation that takes advantage of knowledge and expertise and has developed tools supporting the sharing of best practice and lessons learnt.

DG INTPA created Capacity4dev in 2009, the Commission's online knowledge-sharing platform. This connects international cooperation professionals and allows them to learn, share and collaborate with other colleagues and stakeholders. Users include staff of the EU institutions and international cooperation professionals from EU Member States, partner governments, civil society, NGOs, international organisations and the private sector.

The platform aims to facilitate collaboration and engagement among peers by enabling cross-learning between practitioners from EU institutions and other organisations, allowing them to share lessons learnt and exchange innovative approaches. It also aims to consolidate knowledge-sharing tools and to bring together communities of practitioners in a common environment to improve the efficiency, effectiveness and quality of EU development cooperation.

In addition, DG INTPA has developed a comprehensive 'greening toolbox' to support environment and climate-change mainstreaming in EU international cooperation[119]. The toolbox provides tools and guidance to ensure the integration of climate change and environmental considerations in all EU action and investment activity. It promotes a systematic approach to ensure all relevant obligations are implemented; it also proposes proactive ideas to ensure that EU support goes beyond minimum safeguards, applying the 'do no significant harm' principle to ensure that EU policies and programmes do not have a negative impact on and environmental objectives, offering diverse tools, guidance and training to facilitate the green and clean transition across all sectors. DG INTPA programmes and actions are expected to draw on lessons learnt from previous projects. The following are recent examples of projects with a particular focus on sharing lessons learnt.

Advancing climate adaptation in the Southern Mediterranean (ACA-MED)

The overall objective of this programme, launched at the 2022 UNFCCC Conference of Parties, is to promote the green transition and strengthen the environmental and

[119] The European Union Greening Facility – tools, https://www.switchtogreen.eu/mainstreaming-facility/.

climate resilience of economies and communities in the Southern Mediterranean region. This includes improving knowledge, climate governance, policies and action plans at national/central level to ensure the successful implementation of NDCs and NAPs and facilitate access to climate finance for adaptation purposes, as well as to give local authorities better access to climate finance with a view to investing in climate change adaptation.

The programme builds on the achievements of current and previous regional and bilateral projects.

The AdaptAction programme run by the AFD was already being implemented with good results in other countries and has been extended to the Southern Neighbourhood, where it promotes climate integration and planning across ministries and prepares the ground for large-scale investment projects using a tested methodology.

Other bilateral and regional interventions are ongoing and planned, notably the EU for Climate Action in the Southern Neighbourhood (Clima MED) project, implementation of which finished in December 2025, and six Climate for Cities projects launched in early 2022. Clima MED has provided a solid basis on which the ACA-MED programme has built; in particular, the programme is making use of the national coordination groups established in each participating country and using the climate action strategies developed by Clima MED to provide guidance on effective climate mainstreaming. Clima MED has also promoted local-level climate action by helping cities develop sustainable energy access and climate action plans (SEACAPs) and join the global Covenant of Mayors (CoM) initiative for climate and energy via CoM MED, a regional branch for Northern Africa and the Middle East. Clima MED will build on these achievements and interact with the SEACAP support mechanisms established in each country to raise funding for the financing of existing SEACAPs[120].

Sustainability in Global Value Chains

Through the Team Europe initiative (TEI) on sustainability in global value chains, the EU and its Member States support partner-country governments, businesses and civil society in strengthening their capacity to meet with each other and benefit from evolving international and EU standards on sustainability, human rights and environmental due diligence.

The Corporate Sustainability Due Diligence Directive provides an important framework for promoting responsible business conduct and encouraging more sustainable practices across global supply chains. The TEI on sustainability in global value chains supports the inclusive implementation of the EU's due diligence legislation by considering the development context and the dynamics within partner countries, thereby fostering true partnership and shared responsibility.

[120] Action Document for Advancing Climate Adaptation in the Southern Mediterranean (ACA-MED), https://neighbourhood-enlargement.ec.europa.eu/document/download/9fab0c56-18cd-416d-b546-22aacc703410_en?filename=C_2022_8009_F1_ANNEX_EN_V2_P1_2322952.PDF.

The TEI's main tool is the EU Due Diligence Navigator for Partner Countries – an online platform designed to help users explore available resources and identify the most relevant support. The Navigator's online database enables users to search for information, tools, training opportunities, financing options, policy support and networks related to human rights and environmental due diligence in their country and sector. Based on the individual needs of users, a team of experts will help identify initiatives that strengthen sustainable business practices and promote fairer, more responsible value chains. By connecting people, policies and resources the Navigator aims to strengthen sustainability and resilience across global value chains, turning regulatory change into a pathway for empowerment and inclusive growth.

Green Blue Alliance for the Pacific and Timor-Leste

Pacific islands

EUR 500 million

Dual-purpose project EU's contribution projected to amount to EUR 500 million for the period 2021-2027. The initiative builds on the shared ambition of the two regions for a low carbon and resilient global economy by 2050. The initiative includes:

- protecting climate change resilience of Pacific Islands' ecosystems.
- Timor-Leste: planting 4 million trees with a sustainability strategy and including carbon credits certification to provide income for communities.
- Solomon and Papua New Guinea: Global Gateway projects for the development of water and wastewater infrastructure.
- Papua New Guinea: upgrading rural roads, contributing to safer and more environmentally friendly transport.
- Pacific Solutions: an integrated ocean management project to sustain livelihoods today and into the future.

Additional high-level information can be found in this project fiche.

SAFE4ALL, ALBATROSS, and ACACIA

Sub-Saharan Africa

EUR 15 million

Horizon Europe

The projects are jointly strengthening climate resilience across Ghana, Kenya, Tanzania, Zimbabwe, Madagascar, and South Africa by generating locally relevant knowledge, tools, and services to support climate adaptation. The activities includes:

- Climate services and decision support: developing atlases, localized forecasts, and digital platforms to anticipate droughts, floods, and cyclones, while tailoring information to the needs of local communities, farmers and policymakers.
- Nature-based solutions: integrating socio-economic, ecosystem, and climate data to design adaptation strategies that harness natural processes for resilient agriculture, water, and land management.
- Local action and empowerment : co-creating solutions with local actors, ensuring that climate services translate into effective policies from migration strategies to livelihood security.

Additional information for each project can be found here: SAFE4ALL, ALBATROSS (capacity buildingspecifically), and ACACIA.

Additionally, Section 12.5 'Preparedness and Resilience' in the CAPR 2024 Staff Working Document contained overviews of EU-funded adaptation projects. Two notable mentioned projects for capacity-building are *Mission Regions4Climate* and *LIFE UrbanStorm*.

6 Research and systematic observation

Research and systematic observation have greatly improved our understanding of climate change and its causes and its impacts. They provide the scientific evidence and data needed to develop EU climate policy and support international climate action.

Research and innovation are also essential for reaching climate neutrality by 2050 and adapting to the growing impacts of climate change. They cover a wide range of areas, including Earth system science, polar and ocean research, climate adaptation and resilience, technologies and pathways for reducing emissions, social sciences, behavioural change, nature-based solutions and biodiversity.

Systematic Earth observation complements this research by providing data on how the climate is changing and how climate action is progressing. Copernicus, the Earth observation component of the EU Space Programme, combines data from satellites and ground-based observation networks. Its six services cover the atmosphere, marine environment, land, climate change, security and emergency management.

The EU supports these activities mainly through Horizon Europe, the EU Space Programme and the European Research Infrastructures, as described in the following sections.

6.1 General policy on research and systematic observation

Research, technological development and space are areas over which the EU and its Member States share responsibility. Cooperation is organised through the European Research Area (ERA), which was created in 2000 to strengthen coordination of research across Europe.

The ERA supports countries in coordinating their research and working together on shared priorities. One of its tools is the Joint Programming Initiatives, which support cooperation in areas such as climate, oceans and agriculture and food security. The European Research Area Network (ERA-NET) schemes also help coordinate national and regional research programmes.

The ERA has been further strengthened in recent years. In 2021, the Pact for Research and Innovation in Europe was adopted. This sets common principles and priorities for cooperation. The Commission proposal for the European Research Area Act in 2026 is not yet adopted. At the time of the submission of this report the process was still ongoing.

In June 2026, the Commission launched calls for evidence on a future EU Ocean and Water Research and Innovation Strategy. The strategy will set common research and innovation priorities for the ocean and freshwater and support the implementation of the European Ocean Pact and the European Water Resilience Strategy.

Research activities in Member States on low-carbon energy are coordinated through the strategic energy technology plan, adopted by the EU in 2008. The European Energy Research Alliance was established alongside the plan to align the research and development activities of research organisations with common European priorities and to support joint programming at EU level.

The European Commission sets the overall direction for EU research and innovation through strategic plans. The Horizon Europe Strategic Plan 2025-2027 guides funding for the final three years of Horizon Europe (see Section 6.3.1). It focuses on major global challenges, with the green transition as one of its three main priorities.

Open access is an important principle of EU research and data policy. Under Horizon Europe, open science is a legal obligation. Open science aims to make research outputs available as early and openly as possible, while allowing restrictions where necessary. Scientific publications resulting from Horizon Europe funding must be made openly accessible, and research data must follow the FAIR principles: they must be findable, accessible, interoperable and reusable. The general approach is ‘as open as possible, as closed as necessary’.

Several EU initiatives support these requirements. The European open science cloud provides an environment where researchers can find, share and reuse research data, tools and services. Open Research Europe offers researchers funded by EU programmes an open-access platform for publishing their results. Researchers can also deposit publications, data and other research outputs in trusted repositories, including Zenodo.

Open access also applies to important EU observation data. Copernicus Earth observation data and information are available on a free, full and open basis. This supports their use by researchers, public authorities, businesses and international partners.

The Open Data Directive extends this approach to public-sector data in Member States. Its rules on high-value datasets require important public datasets to be made available free of charge, in machine-readable formats and through appropriate technical interfaces. These datasets cover six areas, including geospatial, Earth observation, environmental, meteorological, statistical and mobility data.

The main EU-level actors in research and systematic observation are described in the EU's 6th and 7th National Communication reports. They have not changed during the reporting period and are expected to remain the same.

6.2 International cooperation and support

International cooperation in research and innovation is an important part of the EU's response to global challenges, including climate change. The EU promotes open and rules-based cooperation, while seeking reciprocity and common standards with international partners.

The European Commission participates in and supports a wide range of international research and scientific initiatives. These include the IPCC, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the Group on Earth Observations, the Global Climate Observing System, the Belmont Forum and Mission Innovation. The EU also supports international cooperation on oceans, clean hydrogen and sustainable urban development.

For the ocean, this cooperation includes the All-Atlantic Ocean Research and Innovation Alliance, which links research partners around the Atlantic Ocean from the Arctic to Antarctica, and support for the UN Decade of Ocean Science for Sustainable Development (2021-2030). At the third UN Ocean Conference in Nice in June 2025, the Commission announced around EUR 1 billion in support for ocean conservation, science and sustainable fishing. In polar research, the EU supports international Arctic and Antarctic science cooperation through Horizon Europe and contributes to the Arctic Science Ministerial process.

The strategic forum for international scientific and technological cooperation supports the international dimension of the European Research Area. It helps identify areas for

coordinated cooperation between the EU, Member States and partner countries outside the EU.

Horizon Europe is one of the EU's main tools for international cooperation in research and innovation. The programme is open to participants from around the world and includes targeted cooperation with key countries and regions including Africa, Latin America and the Caribbean, and Southeast Asia. For example, the African Union-EU Innovation Agenda has climate action and the green transition among its priorities. Cooperation includes projects on climate services, early warning systems, clean energy and adaptation planning.

Horizon Europe also supports research that contributes to major international scientific assessments, including those of the IPCC. EU research programmes have also provided direct support to the IPCC secretariat and its technical bodies, including support for the participation of scientists from developing countries.

EU systematic observation also supports international climate cooperation. Copernicus provides data, services and expertise to international initiatives. For example, the Copernicus Climate Change Service interactive atlas builds on the IPCC Sixth Assessment Report interactive atlas. Copernicus also contributes to the annual European State of the Climate report, produced jointly with the World Meteorological Organization, and publishes regular Ocean State Reports through its Marine Service.

6.3 Funding of research and systematic observation

The European Commission has applied climate mainstreaming since the 2014-2020 multiannual financial framework, meaning that climate mitigation and adaptation objectives are integrated into relevant EU policies and spending programmes, including those supporting research and systematic observation.

Under the 2021-2027 multiannual financial framework and NextGenerationEU (the programme of recovery from the COVID-19 crisis), at least 30% of EU spending is expected to contribute to climate objectives. Current data indicate that the EU is on track to meet and exceed this target.

Table 26 shows the expected contribution of the main programmes to climate action relevant to research and systematic observation. These programmes are described in the following subsections.

Table 26: Climate expenditure 2021-2027 in research programmes (EUR million)

Programme	2021	2022	2023	2024	2025	2026	2027	Total	% of climate expenditure on total envelope
Horizon Europe	4 516	4 740	4 945	4 989	4 590	4 792	4 169	32 740	35%
LIFE	440	435	458	464	422	469	486	3 173	58%
European Space Programme (includes Copernicus)	255	297	324	336	368	0	0	1 580	11%

Source: EU budget contribution to climate action

In addition to directly funding research and systematic observation relevant for climate change, the EU's Innovation Fund supports projects in which innovative low-carbon technologies are demonstrated.

6.3.1 Horizon Europe

Horizon Europe is the EU's main research and innovation programme for 2021-2027. It supports research and innovation that address major challenges – including climate change – and strengthen EU competitiveness. It also supports systematic observations by funding research and other activities that improve observation systems, data and related services.

The programme has a budget of EUR 95.5 billion. At least 35% of its budget is expected to contribute to climate objectives. The current work programme for 2026-2027 has a budget of EUR 14 billion, of which around EUR 4.9 billion is dedicated to climate action.

Horizon Europe is organised around three pillars.

Pillar I – Excellent Science supports frontier research, researcher training and research infrastructure. Although funding is based mainly on scientific excellence rather than specific policy objectives, it makes an important contribution to climate research. For example, an analysis of the evidence cited in the IPCC Sixth Assessment Cycle found that more than 40% of the 4 566 citations were linked to research at least partly funded by Horizon Europe. This pillar also provides EUR 2.4 billion for research infrastructures, including those relevant for systematic observation.

Pillar II – Global Challenges and European Industrial Competitiveness provides most of Horizon Europe's climate-related funding. In particular, Cluster 5, on climate, energy and mobility, with a budget of EUR 15.1 billion, supports climate science, competitiveness, strategic resilience, mitigation and adaptation, clean energy, advanced biofuels and renewable fuels of non-biological origin, electrification, and low and zero-emission sustainable transport. Climate-related research is also funded through Cluster 6, on food, the bioeconomy, natural resources, agriculture and

environment, and Cluster 4, on digital, industry and space, including activities related to Earth observation.

Pillar II also supports **European Partnerships**, which bring together the European Commission and public and private partners to coordinate research and innovation. Several of these partnerships contribute to climate objectives, including in clean energy, transport, the bioeconomy and biodiversity, as well as the Sustainable Blue Economy Partnership and the Water4All partnership on water security.

Pillar III – Innovative Europe supports breakthrough innovation and the scaling up of new technologies. The European Innovation Council funds many climate-relevant innovations, including in green hydrogen, carbon management and energy storage. The European Institute of Innovation and Technology also supports climate action through its knowledge and innovation communities (KICs), including the Climate-KIC.

Horizon Europe also contributes indirectly to jobs and skills for the climate transition by supporting research, innovation, demonstration and system transformation in areas such as climate science, adaptation, clean energy, sustainable transport, biodiversity and industrial innovation.

Horizon Europe also supports the **EU Missions**, large-scale initiatives with clear, time-bound goals addressing major societal challenges. By bringing together researchers, policymakers, citizens and other stakeholders, EU Missions combine resources and expertise to develop, test and scale up practical solutions to major societal challenges. Four of the five missions are closely linked to climate action: adaptation to climate change, climate-neutral cities, restoring oceans and waters, and soil health. Missions are mainly implemented through Pillar II but can also draw on activities and funding from other parts of Horizon Europe and other EU programmes.

The Mission 'Restore our Ocean and Waters by 2030' aims to protect and restore marine and freshwater ecosystems and biodiversity, prevent and eliminate pollution, and make the blue economy carbon-neutral and circular. It is implemented through four lighthouses covering the Atlantic and Arctic, the Mediterranean, the Baltic and North Sea, and the Danube and Black Sea basins, with over 200 demonstration sites operational. More than 1 000 actions have been pledged under its Mission Charter, mobilising over EUR 8 billion.

6.3.2 LIFE programme

The LIFE programme is an EU funding programme dedicated to environment, climate and energy objectives. It supports the transition to a clean, circular, energy-efficient, climate-neutral and climate-resilient economy. While LIFE is not a research programme, it supports the development, demonstration and deployment of innovative solutions and approaches.

The 2021-2027 LIFE programme has a budget of EUR 5.4 billion, with EUR 3.17 billion marked as relevant for climate change (see Table 25). Of the total budget, EUR 1.94 billion is allocated directly to climate action, covering climate change

mitigation and adaptation and energy transition sub-programmes. The remaining climate contribution comes from climate co-benefits from other environmental projects. Together, these activities support climate mitigation and adaptation, renewable energy and energy efficiency.

6.3.3 COST Actions

European Cooperation in Science and Technology (COST) is an intergovernmental framework consisting of 41 full members (EU Member States and other European countries), one cooperating member (Israel) and one partner member (South Africa). It funds the COST Actions, four-year interdisciplinary networks that bring together researchers, innovators and other experts.

COST funding supports networking rather than research itself, including meetings, training schools and short-term scientific missions. It can therefore help researchers build partnerships and prepare for further research funding, including under Horizon Europe. Recent climate-related COST Actions include CliMent, on climate change impacts on mental health, and ANTICIPATE, on multi-hazard predictions and early warnings.

6.3.4 European Space Programme

The objectives of the European Space Programme include protecting the environment and helping to tackle climate change.

The programme has a budget of EUR 14.88 billion for 2021-2027, of which EUR 2.1 billion is relevant for climate action (see Table 25).

Within this budget, EUR 5.42 billion is allocated to Copernicus, the EU's Earth observation programme. The UK is participating in Copernicus since 1 January 2024. Its financial contribution provides additional funding for Earth observation activities, including the third Copernicus CO_2 monitoring mission (CO2M) satellite.

6.4 Research

As noted in previous sections, advancing climate science is an important EU priority. EU research and innovation programmes support a wide range of climate-related research and provide scientific evidence that informs EU and international climate policy.

This chapter presents examples of EU-funded projects and other climate-related research and innovation activities. It focuses mainly on projects ending in 2026 or later, most of which are funded under Horizon Europe.

Given the large number of activities that the examples are drawn from, the list is not intended to be comprehensive. Instead it provides a representative sample of recent and ongoing work. Information on EU-funded research projects and their results is publicly available through the EU Funding and Tenders Portal and the Community Research and Development Information Service.

6.4.1 Climate processes and climate system studies

EU-funded research supports the development and improvement of Earth system models and the understanding of processes that shape the climate system. Current work combines climate modelling with observations, paleoclimate evidence, artificial intelligence and advanced data analysis to improve projections of future climate conditions and extreme events.

Research also examines interactions and feedback loops within the climate system, including greenhouse gas fluxes from ecosystems, aerosols, clouds, non-CO_2 climate forcers and fluorinated gases. Other activities focus on the role of oceans, glaciers and ice sheets, including changes in ocean circulation, the global carbon cycle and sea-level rise. This includes the ocean's role as a carbon sink and heat reservoir, the stability of the Atlantic Meridional Overturning Circulation, and the contribution of the Greenland and Antarctic ice sheets to future sea-level rise.

Paleoclimate studies help improve understanding of past climate transitions and tipping points, while new monitoring technologies provide better observations of the atmosphere and polar regions. Together, these activities strengthen the scientific basis for climate modelling, projections and risk assessment.

Project example: Beyond EPICA

Project name:

Beyond EPICA Oldest Ice Core: 1.5 Myr of greenhouse gas – climate feedbacks

Description:

To design effective strategies of mitigation and adaptation to the current man-made climate change and improve our ability to predict future climate changes, we need to carefully study the past. The Antarctic ice sheet contains a unique record of the Earth's climate history. The air bubbles trapped in the ice preserve a record of the Earth's atmosphere through time. The EU-funded Beyond EPICA project set up a camp at Little Dome C in East Antarctica with the aim of obtaining quantitative, high-resolution ice-core information on climate and environmental changes over the last 1.5 million years. This includes a major transition in the rhythm and intensity of ice age cycles. In January 2025, drilling reached bedrock at a depth of about 2 800 m, recovering ice at least 1.2 million years old. First results, presented at the European Geosciences Union General Assembly in May 2026, show a continuous record of climate and atmospheric composition over 1.2 million years, the longest obtained from an ice core, in which atmospheric CO_2 tracked global temperature changes across several glacial cycles. The full results are being prepared for publication.

Project coordinator and participating countries:

Consiglio nazionale delle ricerche, Italy

Denmark, France, the Netherlands, Norway, Sweden, Germany, the United Kingdom, Switzerland and Belgium

Total investment; EU contribution:

EUR 10 999 942; EUR 10 999 942

Start and end dates (Duration):

1 June 2019 to 31 May 2027 (8 years)

6.4.2 Modelling and prediction

EU-funded research is improving climate modelling and prediction across different spatial and time scales. This includes the use of high-resolution simulations, satellite observations, artificial intelligence and machine learning to improve the representation of climate processes and extreme events and to reduce uncertainty in projections.

Research also helps translate global climate projections into information that can be used at regional and local level. This includes downscaling models for European seas and coastal areas, combining physical and impact modelling, and developing indicators for climate risks, ecosystem changes and infrastructure resilience.

Other work explores low-probability but potentially high-impact climate developments and develops faster and more efficient modelling approaches. Digital twins and integrated modelling systems are also being used to combine observations, historical data and future scenarios and to support climate services and adaptation planning.

Project example: OptimESM

Project name:

Optimal High-Resolution Earth System Models for Exploring Future Climate Changes

Description:

The primary goal of OptimESM is to develop the next generation of Earth system models (ESMs), bringing together increased model resolution and process realism, and to deliver long-term climate projections that better support policy and societal needs, providing guidance on regional climate change at different levels of global warming, the risk of abrupt Earth system changes at these warming levels and the regional impacts arising from such events. It will also

develop new policy-relevant emission and land-use scenarios, including ones that temporarily overshoot the Paris Agreement temperature target.

Project coordinator and participating countries:

Sveriges Meteorologiska och Hydrologiska Institut, Sweden

Denmark, France, the Netherlands, Italy, Austria, Germany, Finland, Cyprus and the United Kingdom.

Total investment; EU contribution:

EUR 7 691 803.96; EUR 7 691 803.96

Start and end dates (Duration):

January 2023 to December 2027 (5 years)

6.4.3 Research on the impacts of climate change

EU-funded research examines how climate change affects natural systems, societies, economies and infrastructure, and how these impacts develop across different regions and timescales. It also improves climate information and services so that projections can better support adaptation and decision-making.

A major area of research concerns extreme events, tipping points and changes in the cryosphere. This includes improving the attribution and forecasting of climate-related events, understanding interactions between climatic and socio-economic drivers of risk, and studying changes in snow, glaciers, ice sheets and permafrost. Research also addresses climate impacts on marine and coastal ecosystems, including ocean warming, marine heatwaves, acidification and deoxygenation, and their consequences for fisheries and coastal communities.

Research also addresses impacts on ecosystems, biodiversity and cultural heritage. Some projects focus on specific species or ecosystems to better understand their capacity to adapt to changing conditions, while others assess how climate-related hazards affect cultural assets. Together, this work strengthens the evidence base for climate risk assessment and adaptation.

Project example: TipESM

Project name:

Exploring Tipping Points and Their Impacts Using Earth System Models

Description:

Tipping points are critical thresholds in the Earth system where small changes can lead to major and lasting consequences. TipESM brings together a diverse team of scientists to study these tipping points. Using state-of-the-art ESMs, this international collaboration aims to pioneer early warning indicators and emission pathways that mitigate the risk of crossing these perilous thresholds. TipESM scrutinises critical processes like ice sheets and vegetation and marine biogeochemistry. By developing a tipping points risk register, the project promises to cultivate a more informed and prepared society. In cooperation with the World Climate Research Programme/Tipping Points Modelling Intercomparison ProjectTipESM will organise an international collaborative effort to design and implement a common ESM experiment protocol that will facilitate analysis of the likelihood of the occurrence, and potential reversibility, of tipping elements at different levels and durations of global warming.

Project coordinator and countries of participants/partners:

Danmarks Meteorologiske Institut, Denmark.

Sweden, France, the Netherlands, Norway, Germany, Spain, the United Kingdom and Switzerland.

EU contribution:

EUR 4 864 470.59

Start and end dates (Duration):

January 2024 to December 2027 (4 years)

6.4.4 Socio-economic analysis and climate responses

EU-funded research examines how climate risks affect economies, households, businesses and essential services, and how these risks can spread through interconnected socio-economic systems. This includes improving models used to assess physical and socio-economic climate risks and evaluating the distributional effects of different mitigation and adaptation pathways.

Research also supports better adaptation planning and monitoring. Current work is developing indicators that measure actual progress in reducing vulnerability and increasing resilience, while improving the integration of climate information into decision-making at local, regional and national levels.

Other activities address sustainable land use and land management, including the links between climate change, biodiversity, agriculture and rural development. EU-funded work also examines emerging issues such as the governance of research on solar radiation modification, with a focus on its risks, uncertainties and possible international governance arrangements.

Project example: NEWPATHWAYS

Project name:

New Pathways for Equitable Climate Action in Line with the Paris Agreement and Sustainable Development

Description:

The project will develop innovative solutions to reinforce global climate action. It will analyse and devise next-generation Paris-aligned transformation pathways to inform the 2028 global stocktake. The pathways will combine profound sectoral transformations with considerations of equity, finance and nature protection to identify opportunities for strengthening climate action, contributing significantly to global climate goals. In addition, the project aims to enhance the consistency, clarity and transparency of greenhouse gas emission reduction commitments.

Project coordinator and countries of participants/partners:

Potsdam-Institut für Klimafolgenforschung EV, Germany

Austria, the Netherlands, Italy, Greece, the United Kingdom, Brazil, India, Vietnam, Kenya, Switzerland, China, Saudi Arabia, South Korea, India, Japan, the United States and Thailand.

Total investment; EU contribution:

EUR 4 999 395.00; EUR 4 999 395.00

Start and end dates (Duration):

January 2025 to June 2028 (3.5 years)

6.4.5 Research and development on mitigation and adaptation approaches, including technologies

EU-funded research supports the development of technologies, models and data needed for climate mitigation and adaptation. This includes improving greenhouse gas emissions monitoring, integrated assessment models and methods for evaluating pathways towards climate neutrality.

A major area of work concerns low-carbon technologies and carbon management. Research covers carbon dioxide removals, methane monitoring and reduction, biomethane, renewable hydrogen and solutions for climate-neutral cities and resilient infrastructure. Other activities assess the environmental, social and economic implications of scaling up these approaches.

Research also supports nature-based mitigation and adaptation, including the restoration of wetlands and peatlands and the management of forests and land. In

parallel, EU-funded projects examine the material needs of the climate transition and how circular economy approaches, resource efficiency and recycling can reduce associated environmental impacts.

Project example: ELEVATE

Project title:

Enabling and Leveraging Climate Action Towards Net-Zero Emissions

Description:

To implement the Paris Agreement's goals, greenhouse gas emissions need to be reduced to net-zero around 2050. However, current policies are still insufficient to reach this target and net-zero promises by countries are generally lacking concrete roadmaps for how to reach them. ELEVATE's main aim was to develop new scientific insights to support the preparation of NDCs and national climate policies focused on achieving net-zero emissions in line with the Paris Agreement. The project was developed by a transdisciplinary consortium of national and international climate research teams interacting actively with policymakers and other stakeholders on climate policy and the SDGs.

Project coordinator and countries of participants/partners:

MINISTERIE VAN INFRASTRUCTUUR EN WATERSTAAT, the Netherlands.

Germany, Austria, Italy, Greece, Denmark, Brazil, India, China, Poland, Algeria, Japan, the United States, Saudi Arabia and the United Kingdom.

EU contribution:

EUR 4 723 324.25

Start and end dates (Duration):

September 2022 to August 2026 (4 years)

6.5 Systematic observation

Copernicus and the European Research Infrastructures are the main European systems for systematic climate observation. Copernicus is the Earth observation component of the EU Space Programme. Its dedicated Sentinel satellites observe a wide range of variables related to the Earth's surface and atmosphere. The European Space Agency develops the Copernicus space component and operates the Sentinel satellites together with EUMETSAT.

Sentinel data are complemented by observations from other national, European and international satellite missions, known as Copernicus contributing missions.

Copernicus also uses data from ground-based monitoring networks and other observation systems. These observations complement satellite data and are also used to check and improve the accuracy of satellite measurements. The EEA coordinates this part of the Copernicus observation system.

Observation data are processed into information products through six Copernicus services:

- the Copernicus Atmosphere Monitoring Service (CAMS);
- the Copernicus Marine Service;
- the Copernicus Land Monitoring Service;
- the Copernicus Climate Change Service (C3S);
- the Copernicus Emergency Management Service (CEMS); and
- the Copernicus Security Service.

EUMETSAT also contributes to systematic climate observation through its network of satellite application facilities. These provide specialised products and services covering areas such as climate monitoring, land surfaces, oceans and sea ice.

The European Research Infrastructures provide another important source of ground-based climate observations. They are established and operated jointly by participating countries, while the EU supports their establishment, governance and further development, including through Horizon Europe. Their monitoring networks also provide important data for Copernicus services.

The following sections describe the main EU observation systems covering the atmosphere, ocean, terrestrial ecosystems and cryosphere. They also set out the EU's support for observation systems in developing countries and the EU contribution to global systematic observation. CEMS complements these systems by providing continuous information and forecasts on climate-related hazards, including floods, forest fires and droughts.

6.5.1 Atmosphere

The Copernicus Sentinel-5 Precursor mission, launched in 2017, was the first Copernicus mission dedicated to monitoring the atmosphere. In addition to air pollutants, it measures climate-relevant atmospheric constituents, including ozone and methane.

Sentinel-4 and Sentinel-5, launched in 2025, expand these observations. Sentinel-4 carries out frequent measurements over Europe, including of ozone, while Sentinel-5 provides daily global measurements of methane and ozone.

Under the Copernicus CO_2M a further expansion of greenhouse gas observations is planned for 2027-2029. Its satellites are expected to measure atmospheric CO_2 and

CH_4 concentrations with global coverage. These observations will support Copernicus CO_2 monitoring and verification support capacity.

C3S and CAMS are the main Copernicus services providing information on the atmosphere and climate. Both are implemented by the European Centre for Medium-Range Weather Forecasts.

C3S provides datasets for a wide range of essential climate variables through its climate data store. These variables include precipitation, radiation, water vapour, ozone, aerosols and greenhouse gases. C3S also provides climate reanalysis datasets, which combine historical observations with models to produce consistent information over time and space. These include fifth generation ECMWF atmospheric reanalysis, ERA, while work on the next-generation, ERA6 reanalysis has started.

CAMS provides information on atmospheric composition and greenhouse gases. Its products include atmospheric reanalysis, radiative forcing and observation-based information on greenhouse gas fluxes. The methane hotspot explorer uses Sentinel-5 Precursor observations to identify and assess large methane plumes from major local emission sources.

Both services combine satellite observations with ground-based and aircraft measurements. Important European Research Infrastructures include:

- the In-service Aircraft for a Global Observing System;
- the Aerosol, Clouds and Trace Gases Research Infrastructure;
- the Integrated Carbon Observation System (ICOS).

These infrastructures are important observation systems in their own right. For example, ICOS provides continuous measurements of greenhouse gases such as CO_2, CH_4 and N_2O from stations across Europe.

Atmospheric observations continue to expand. CAMS is developing observation-based estimates of greenhouse gas emissions as part of the CO_2 monitoring and verification support capacity. The system will combine satellite and ground-based observations with atmospheric models to produce independent estimates of greenhouse gas emissions at global, national and subnational levels.

6.5.2 Oceans

Copernicus's Sentinel-1 and Sentinel-3 contribute to ocean observation. They provide information on variables including ocean winds, waves, ocean colour, sea-surface height and sea-surface temperature.

The Copernicus marine service is the main Copernicus service for ocean monitoring. It combines satellite observations, models and measurements from monitoring networks to provide information on the physical and biogeochemical state of the ocean. The service produces both historical reanalysis and forecast datasets. It has also published an annual Ocean State Report since 2018.

Its monitoring is organised around three broad areas:

- the Blue Ocean, covering variables such as ocean temperature, ocean heat content and salinity;
- the Green Ocean, covering variables such as ocean phytoplankton and nutrients;
- the White Ocean, covering sea ice and icebergs.

These observations are complemented by measurements taken directly in the ocean, for example from profiling floats, research vessels, buoys, tide gauges and sensors on marine mammals. The service combines data from global, European and national monitoring networks and research infrastructures.

Important European Research Infrastructures and networks for in situ ocean observation include Euro-Argo ERIC, the European contribution to the global Argo array of profiling floats; the European Multidisciplinary Seafloor and water-column Observatory (EMSO ERIC); the ocean component of ICOS, which measures air-sea CO_2 exchange; and the European Marine Observation and Data Network (EMODnet), which makes marine data freely available. EuroGOOS coordinates operational oceanography in Europe.

Ocean observation in Europe is being expanded and better coordinated. The Copernicus Sentinel-6 satellites, Sentinel-6 Michael Freilich (launched in 2020) and Sentinel-6B (launched in November 2025), are extending long-term measurements of sea level, while the EU is working to better connect marine observation systems and Research Infrastructures across Europe.

Horizon Europe supports this work by improving data sharing and developing new ways to monitor the ocean, including its role in the carbon cycle. The OceanEye initiative, presented by the Commission in June 2026 as a key element of the European Ocean Pact, aims for the EU to provide 35% of the global ocean observing system by 2035. It includes EUR 62 million under Horizon Europe to strengthen the EU contribution to the Global Ocean Observing System and global ocean data systems, as well as EUR 30 million for innovation in ocean observation technologies, a European digital ocean system and a European Digital Twin of the Ocean, to be fully operational by 2030.

6.5.3 Land cover

Copernicus Sentinel satellites 1, 2 and 3 provide observations of the land surface. These include land cover and land-cover change, land-surface temperature and other characteristics of vegetation and inland waters.

The Copernicus land monitoring service is the main Copernicus service for land monitoring. The service provides products at global, European and local level. These include information on land-surface temperature, inland waters, vegetation and land cover. For example, the CORINE Land Cover dataset has tracked land cover in Europe since 1990. It also provides indicators that help monitor vegetation condition and productivity.

The next generation of CORINE Land Cover is being developed to provide more detailed and flexible information on land cover and land use. This includes new products relevant to land use, land-use change and forestry and to monitoring under the Common Agricultural Policy.

Many Copernicus land products rely on ground-based measurements to check their accuracy. The ground-based observations for validation service brings together measurements such as leaf area, surface radiation and soil moisture from European and international monitoring networks.

The European Research Infrastructures also monitor land ecosystems. They provide a wide range of observations on ecosystem conditions and processes, including greenhouse gas exchanges and biodiversity.

6.5.4 Cryosphere

Copernicus and the European Research Infrastructures also contribute to monitoring the cryosphere, which includes areas where water is present in solid form, such as snow, glaciers, ice sheets and sea ice.

Some long-term ecosystem monitoring stations are located in the Arctic and at high elevations in the European Alps. These provide important in situ observations. They include the Svalbard Integrated Arctic Earth Observing System (SIOS), a permanent member of the EU Polar Cluster. European research stations and ice-core programmes in Antarctica also provide long-term observations of the ice sheet and atmosphere.

Satellite observation is also essential. Sentinel-1C, launched in 2024, provides high-resolution radar observations used for monitoring sea ice, glacier movement and icebergs.

Future Copernicus missions will further strengthen polar observations from 2028 and 2029. The Copernicus polar ice and snow topography altimeter is expected to provide information on sea-ice thickness, snow depth and ice-sheet elevation. The Copernicus imaging microwave radiometer is designed to provide frequent observations of polar regions, including sea-ice concentration and snow.

Copernicus provides specific products for the cryosphere, including a dedicated Arctic regional reanalysis, monitoring of sea-ice cover and volume, and support for improving short-term sea-ice forecasts. It also provides information on snow cover, snow-water equivalent and lake ice. Its high-resolution snow and ice products have been expanded to include daily global snow-cover information based on Sentinel-3 observations.

6.5.5 Support for developing countries

The EU supports systematic observation in developing countries by providing access to Copernicus data and services and by helping develop climate-related research infrastructures and observation networks.

Most Copernicus data and information are available worldwide on a free, full and open basis. The EU also promotes their use through international outreach and training. This includes support for users in developing countries to access and use climate information and the C3S climate data store.

The EU also supports cooperation between the European Research Infrastructures and partners outside Europe. Previous projects such as RI-VIS and SEACRIFOG strengthened cooperation with research infrastructures in Africa and Latin America. The Horizon Europe KADI project has continued work to develop stronger and more sustainable African research infrastructures.

6.5.6 Contribution to global systematic observation

Copernicus and the Research Infrastructures make an important contribution to global systematic observations.

The Global Climate Observing System (GCOS), co-sponsored by the World Meteorological Organization, regularly assesses the status of global observations of the atmosphere, land and ocean. Its assessments recognise the contribution of Copernicus and European observation systems. The EU has also supported the GCOS secretariat since 2020.

For the ocean, the EU contributes to the Global Ocean Observing System (GOOS), led by the Intergovernmental Oceanographic Commission of UNESCO. Under OceanEye, the EU and IOC-UNESCO are setting up an international alliance to mobilise investment in global ocean observation.

Copernicus provides data for many essential climate variables identified by GCOS. C3S and CAMS products have also contributed directly to international scientific assessments, including the IPCC Sixth Assessment Report.

The European Research Infrastructures are part of wider global observation networks. European infrastructures also cooperate with counterparts in other regions. For example, ICOS and the European Long-Term Ecosystem Research network participate in the Global Ecosystem Research Infrastructure initiative.

The Copernicus CO_2 monitoring and verification support capacity will further strengthen the EU's contribution to global climate monitoring. It is expected to combine CO2M satellite measurements, ground-based observations and modelling to provide independent estimates of CO_2 and CH_4 emissions at national and subnational level. These estimates could complement information reported under the Paris Agreement and contribute to future global stocktakes.

The EU also contributes to the World Meteorological Organization's Global Greenhouse Gas Watch. This initiative brings together space-based and surface-based observations with modelling and data assimilation to improve global greenhouse gas monitoring. Horizon Europe is supporting coordination of the European contribution to this initiative.

7 Education, training and public awareness

This chapter describes how the EU supports education, training and public awareness on climate change. It covers initiatives to develop knowledge and skills for the green transition, inform and engage citizens, support public participation and local climate action, monitor public opinion, and promote international cooperation. Member States remain responsible for their education and training systems, while the EU supports and complements their efforts through policy cooperation, funding, research, practical tools and the exchange of good practices.

7.1 Education and training

Member States are responsible for education and training policy, while the EU supports and complements their actions. It does this through policy cooperation, exchange of good practices, research and practical tools, as well as funding programmes such as Erasmus+, the EU programme that supports education, training and youth through mobility, partnerships and cooperation projects.

Among the priorities of European Education Area is learning for the green transition and sustainability, particularly their link to citizenship (Strategic Priority 2). The main EU initiatives in this area are presented below.

7.1.1 Erasmus+ programme

Erasmus+ supports a wide range of projects that promote sustainability in education and training, youth and sport. Environmental and fighting against climate change are among the programme's four horizontal priorities for 2021-2027. The programme supports projects that develop sustainability competences, raise environmental awareness and promote more sustainable practices in education and training.

Erasmus+ also encourages participating organisations and individuals to reduce the environmental impact of programme activities. This includes using more sustainable means of transport, reducing waste and resource use, and incorporating green practices into projects. The share of participants in Erasmus+ learning mobility activities using low-emission transport nearly tripled from 8% in 2021 to 23% in 2025.

Erasmus+ teacher academies support cooperation between teacher training providers and provide training and learning opportunities for teachers. Several academies focus on sustainability. Examples include GEO-Academy, which develops tools to strengthen teachers' digital, green and spatial skills; FEDORAS Academy, which develops future literacy skills; and REACT Academy, which provides training and resources to strengthen preparedness for natural hazards.

The Centres of Vocational Excellence funded by Erasmus+, support the green transition by embedding sustainability in their education and training, developing green skills and fostering cooperation between VET providers and industry to meet the needs of a greener economy.

The proposal for the Erasmus+ programme for 2028-2034 maintains a strong focus on the green transition. It highlights the role of formal, non-formal and informal learning[121] in raising awareness of climate change and developing the skills and competences needed for the green transition

7.1.2 Learning for the green transition

In June 2022, the Council of the European Union adopted a Recommendation on learning for the green transition and sustainable development. It aims to help Member States and education providers equip learners with the knowledge, skills and attitudes needed to live, work and act sustainably. Education and training systems have an important role in responding to changing skill needs linked to the green transition and climate resilience. The Recommendation is accompanied by a staff working document that provides supporting evidence and further detail.

Since 2022, the European Commission has supported implementation of the Recommendation through peer learning, research and targeted funding. This includes two dedicated EU working groups, on school education and vocational education and training, as well as the European sustainability competence framework (GreenComp), funded through the Erasmus+ programme.

From 2021 to 2025, the working group on schools brought together national authorities and stakeholders to exchange good practice on learning for sustainability. Its outputs include policy recommendations and practical factsheets on strengthening sustainability in school education.

During the same period, a dedicated working group on vocational education and training and the green transition focused on how vocational education and training can respond to changing skills needs and sustainability challenges. Its outputs include two collections of inspiring practices, published in 2023 and 2024, as well as a final report summarising lessons from its peer learning activities.

GreenComp sets out 12 competences grouped into four areas: embodying sustainability values, embracing complexity in sustainability, envisioning sustainable futures and acting for sustainability. GreenComp is increasingly used in national and regional policies, curriculum design and the professional development of teachers. It also supports the development of learning materials and EU-funded education projects. For example, France's national sustainability competence framework draws on GreenComp. GreenComp has also informed the development of the PISA 2029 climate literacy framework.

[121] Formal learning 'occurs in an organised and structured environment in terms of learning objectives, time or resources (e.g. an education or training institution). Non-formal learning 'occurs in the framework of planned activities – in terms of learning objectives, time or resources – where some form of learning support is present (e.g. student-teacher/trainer relationships)'. Informal learning 'occurs in the framework of daily activities – work, family or leisure – which are not explicitly designated as learning activities in terms of objectives, time or learning support. The delimitation between these forms of learning might be a matter of interpretation and differ from country to country'. For more information on definitions see Cedefop (2023).

To support its uptake, the European Commission runs a dedicated GreenComp community of practice within the Education for Climate Coalition, also supported through Erasmus+, and has conducted a study on how GreenComp is used across different education levels and sectors.

More broadly, the Education for Climate Coalition brings together learners, educators, researchers, policymakers and other practitioners to exchange knowledge, share resources and develop collaborative approaches to sustainability education. Launched in 2020, its online community has grown to more than 10 000 registered members. Its activities include community events and exchanges, the annual Education for Climate Day and the Youth Climate Lab. In 2026, its annual priority is intergenerational fairness, alongside work on green competences, greening schools, youth participation, teacher training and citizenship education.

The European Commission also provides practical resources for schools and teachers. The European School Education Platform (ESEP), supported by Erasmus+, offers news, publications, examples of good practice, professional development opportunities, lesson plans and other teaching materials on sustainability. The EU Academy offers the self-paced online course *Leading Sustainability in School Education*, which explores how sustainability can be integrated into school education through classroom practices, nature-based learning, teacher education and sustainable learning environments. The EU Learning Corner also provides teaching and learning materials on sustainability, climate change and environmental challenges for primary and secondary education.

GreenComp in practice

The Erasmus+-funded GreenComp Assessment for Transformative Education (GATE) project applies GreenComp through a whole-school approach to sustainability. It brings together public authorities, schools and other education stakeholders to test approaches that can support wider policy development. The project offers a school self-evaluation framework, provides training for educators and involves students as co-creators. It also pilots these approaches in schools, offers a certification model for sustainable schools and produces policy recommendations to support the integration of sustainability competences into education systems.

7.1.3 Research in education

The European Commission also supports research on and monitoring of sustainability education. Recent examples of this include the initiatives below.

- The 2024 Eurydice report provides an overview of sustainability education in schools across 39 European education systems. It examines how sustainability competences are integrated into curricula, using GreenComp as a reference,

and how teachers and schools are supported through teacher training, professional standards, funding and other measures.

- The 2024 report Monitoring Learning for Sustainability: Developing a Cross-EU Approach developed a framework for monitoring Member States' progress in integrating sustainability into education.
- The Education and Training Monitor 2024 assessed progress across EU countries in learning for sustainability.
- Research published in 2025 examined how school learning environments, infrastructure and everyday practices can support sustainability. The work resulted in a final report, a practical toolkit, a compendium of good practices and case studies.

7.1.4 Higher education

The 2022 European strategy for universities aims to strengthen the contribution of higher education to the green transition. One of its four objectives is to empower universities as actors of change in the green and digital transitions, including by developing relevant skills and supporting green solutions through research and innovation.

The European universities alliances, supported by Erasmus+, contribute to this objective through closer cooperation between higher education institutions. They develop joint curricula, share expertise and resources, and bring together students, researchers and external partners to address societal challenges, including climate change. Their activities can also include joint courses, micro-credentials and shared infrastructure.

Una Europa Alliance
Una Europa brings together 11 European universities, with sustainability as one of its main areas of cooperation. A key initiative is the joint bachelor's degree in sustainability, launched in 2025. The programme combines an interdisciplinary first year with six specialised tracks covering different dimensions of sustainability, including environmental sciences, economics, law and social sciences.
The alliance also offers a micro-credential in sustainability. The programme for this combines online courses on topics such as climate change, biodiversity, political economy and sustainability, allowing learners to develop interdisciplinary knowledge and skills in a flexible format.

7.1.5 Lifelong learning

The EU also supports learning for sustainability outside formal education. The European agenda for adult learning 2021-2030 and the 2022 Council Recommendation on learning for the green transition and sustainable development provide a policy framework for adult learning in this area. Community centres, NGOs, libraries and other

local organisations can play an important role in raising environmental awareness and developing green skills.

A key platform for adult learning is the Electronic Platform for Adult Learning in Europe (EPALE), supported by the Erasmus+ programme. This allows adult educators and other practitioners to share resources, take part in webinars and exchange experience on topics including green skills, biodiversity and climate action.

Erasmus+ also supports sustainability projects in adult education. Funding can help adult learning providers and local organisations develop non-formal learning activities, exchange good practice across countries and encourage more sustainable lifestyles. The programme also supports more environmentally friendly travel for participants.

The proposal for the Erasmus+ programme for 2028-2034 aims to make participation more accessible, including for smaller organisations. This could help broaden access to funding for community-based and non-formal learning and further support lifelong learning for the green transition.

7.1.6 European Institute of Innovation and Technology

The European Institute of Innovation and Technology (EIT) supports ten knowledge and innovation communities (KICs), which bring together education, research and business to address major societal challenges. The Climate KIC focuses specifically on climate change and supports education and skills development for climate innovation and systemic change. Climate-related education and training are also integrated into the work of other communities.

In recent years, the Climate KIC has increasingly integrated learning and capacity building into its broader climate innovation activities. The Climate KIC Academy provides practical learning programmes for individuals and organisations, while learning partnerships and communities of practice support knowledge exchange and capacity building within organisations and projects.

The Climate KIC also works with international partners on targeted capacity-building initiatives. For example, it participates in the Climate Adaptation Innovation and Learning project led by the United Nations Industrial Development Organisation. Within the project, the Climate KIC leads a community of practice on the incubation and acceleration of micro, small and medium-sized enterprises working on climate adaptation.

The European Institute of Innovation and Technology and its knowledge and Knowledge and Innovation Communities, including the EIT Climqte-KIC, are funded under Pillar III, ‘Innovation Europe’, of Horizon Europe, the EU’s framework Programme for Research and Innovation for 2021-2027. These activities help generate the knowledge base and technological change that underpin evolving labour-market needs and new professional profiles.

7.2 Public information and engagement campaigns

The EU continues to place strong emphasis on informing and engaging the public, stakeholders and local communities on climate change and the green transition. Public awareness and participation are recognised as essential components of effective climate action and form an integral part of the EU's implementation of ACE under the UNFCCC.

During the reporting period, the EU further expanded its efforts to communicate the benefits of climate action, encourage public participation and support local initiatives. These activities ranged from large-scale public awareness campaigns and stakeholder events to public engagement platforms and support for local and regional climate action.

7.2.1 Raising public awareness of climate action

The European Commission regularly organises communication campaigns and citizens events to increase awareness of climate change, showcase successful climate action and facilitate dialogue between policymakers and stakeholders.

A notable initiative was Climate Action That Works for You: An agenda for Competitiveness, Prosperity and Resilience, a high-level stakeholder event organised in September 2025. The event brought together industry and business leaders, policymakers, social partners, civil society organisations, academics and media representatives to discuss the economic and social benefits of climate action and Europe's pathway towards climate neutrality. More than 1 600 participants and 39 speakers took part in the event, which highlighted practical examples of climate action supporting competitiveness, resilience and prosperity across Europe.

The EU has also continued to commemorate the EU Day for the Victims of the Global Climate Crisis, established in 2023. Held annually on 15 July, the day honours those who have lost their lives or been affected by climate-related disasters and serves as a call for greater action to address climate change and strengthen resilience. Commemorative events take place in Brussels and across Member States, often in cooperation with the European Climate Pact community.

To strengthen public resilience to climate-related disinformation, the European Commission launched the #ClimateFactsMatter campaign. The initiative aims to provide citizens with tools to identify and address climate disinformation through social media campaigns, partnerships with media organisations and influencers, and educational resources. Activities have included campaigns in several Member States and the production of more than 170 items of digital content, generating millions of impressions across Europe.

The European External Action Service and the European Commission also continue to implement the global #ForOurPlanet campaign. Launched in 2022, the campaign encourages citizens worldwide to take practical action for the climate and nature, ranging from ecosystem restoration and tree planting to biodiversity conservation and

sustainable lifestyles. The campaign has reached audiences both within the EU and beyond.

Other major EU initiatives also raise public awareness of the green transition. The annual European Sustainable Energy Week brings together policymakers, businesses, civil society and citizens to exchange ideas and showcase solutions for the clean energy transition. European Mobility Week takes place every September and encourages cities and citizens across Europe to promote active mobility, public transport and other clean transport solutions.

7.2.2 European Climate Pact

The European Climate Pact remains the EU's flagship initiative for citizens engagement on climate action. Established in 2020 as part of the European Green Deal, the Pact brings together citizens, local communities, civil society organisations, educational institutions, businesses and local authorities to support climate action across Europe.

Through its network of ambassadors and partners, the Pact facilitates dialogue between citizens and policymakers, promotes the exchange of good practice and supports community-led climate initiatives. Open calls for participation help ensure broad accessibility and encourage involvement from diverse sectors and regions. In 2025 alone, the Pact received more than 1 700 applications from individuals and organisations wishing to join the initiative.

The Pact supports engagement through local and European-level events, public discussions and educational activities. In 2025, Pact-related events brought together more than 6 500 participants. The annual Pact event, co-designed with the Pact community, attracted more than 800 participants and included 21 sessions. Complementing this, climate action days were organised in 23 Member States, creating opportunities for people to exchange experiences and showcase local climate action.

The Pact also contributes to climate literacy and capacity-building through the EU Climate Action Academy, which provides webinars, learning resources and discussions on topics including climate communication, sustainable lifestyles and emerging challenges linked to climate change.

Several targeted campaigns were developed during the reporting period. The Pact2School initiative connected members of the Climate Pact community with schools and universities across Europe, resulting in 112 educational sessions in 22 Member States during 2025 and 2026. The Making an Impact campaign highlighted examples of local climate action through storytelling and media partnerships, while a Europe-wide photo competition encouraged the public to document climate action in their communities, attracting more than 300 submissions and over 4 000 public votes.

7.2.3 Supporting climate action at local and regional level

The EU complements citizens focused engagement with initiatives that support climate action by local and regional authorities.

The EU Covenant of Mayors for Climate and Energy brings together more than 10 500 local authorities committed to EU climate and energy objectives. It supports cities and towns in developing and implementing local climate and energy action and in engaging the public. Recent initiatives include the Cities Energy Saving Sprint, the Cities Heat Detox, Cities Refresh and Homegrown Energy, which promote energy savings, cleaner heating, resilience to heat and locally produced renewable energy.

The EU Mission on Adaptation to Climate Change supports regions and local authorities in understanding climate risks, developing adaptation plans and implementing solutions to strengthen climate resilience. Hundreds of regions and local authorities across Europe are now involved in the mission. Through the mission implementation platform, MIP4Adapt, they can access technical assistance, practical tools and opportunities for peer learning. The Mission also promotes stakeholder and public participation in the development and implementation of local adaptation measures.

The EU Mission on Climate-Neutral and Smart Cities supports 112 European cities in their efforts to become climate-neutral by 2030. Participating cities develop Climate City Contracts setting out their commitments, action plans and investment strategies. More than 100 cities have received the EU Mission Label, which recognises these plans and can facilitate access to financing and investment support. The mission also promotes knowledge exchange between cities and the wider uptake of successful approaches.

The EU Mission 'Restore our Ocean and Waters by 2030' promotes ocean and water literacy. The EU4Ocean Coalition connects organisations, schools and young people working on ocean literacy, including through the Network of European Blue Schools and the Youth4Ocean Forum.

The Commission also recognises local environmental action through the European Green Capital and European Green Leaf awards. The European Green Capital Award is open to cities with 100 000, while the European Green Leaf Award targets smaller cities with a population between 20 000 and 100 000. The awards recognise cities that improve their urban environment, address climate and environmental challenges and engage citizens in the transition towards greater sustainability.

Together these initiatives support cooperation, knowledge-sharing and public participation in climate action at local and regional level.

7.3 Monitoring public opinion

The EU regularly monitors the public's attitudes towards climate change through the Eurobarometer programme, the European Commission's long-standing public opinion survey instrument. Eurobarometer surveys provide valuable insights into public awareness and perceptions of, and behavioural responses to, climate change, helping to inform the development, implementation and communication of EU climate policies.

Since the submission of the EU's Eighth National Communication, two Special Eurobarometer surveys on climate change have been conducted, in 2023 and 2025. These surveys demonstrate that climate change continues to be recognised by a large majority of respondents as a serious challenge requiring action at both individual and collective levels.

The 2023 Special Eurobarometer on Climate Change confirmed that concern about climate change remained high across the EU. More than three quarters (77%) of respondents considered climate change to be a very serious problem at that moment. The survey also showed a strong willingness among citizens to contribute to climate action in their daily lives. More than 6 in 10 citizens (64%) reported having taken action to fight climate change during the previous six months.

The survey further highlighted broad public support for climate action and the energy transition, including measures to increase energy efficiency, expand renewable energy and reduce dependence on fossil fuels. The findings demonstrated that climate change remained a prominent issue for Europeans despite ongoing economic and geopolitical challenges.

The 2025 Special Eurobarometer on Climate Change showed that public concern about climate change remained consistently high. 85% of respondents considered climate change to be a serious problem for the world, underlining the continued salience of climate issues among Europeans.

For the first time, the survey also included questions relating to climate disinformation, providing insights into citizens' exposure to misleading or false information about climate change and their perceptions of its impact on public understanding and climate action. The inclusion of these questions reflects the growing importance of understanding the information environment surrounding climate policy and public engagement.

The survey also found that climate action is increasingly embedded in people's everyday choices and expectations. 59% of Europeans reported having taken action in the previous six months to help combat climate change. In addition, the survey revealed continued support for EU climate objectives and policies, including the transition towards climate neutrality, renewable energy deployment and measures to strengthen energy security through reduced dependence on fossil fuel imports.

Taken together, the 2023 and 2025 Eurobarometer surveys indicate that public awareness of climate change remains high throughout the EU and that a majority of individuals continue to engage in climate-related actions. Monitoring these trends through regular Eurobarometer surveys enables the European Commission and Member States to assess public perceptions, identify communication needs and support the effective implementation of climate policies in line with the objectives of the Paris Agreement and the European Green Deal.

7.4 Other communication activities and online resources

The EU institutions publish a wide range of reports, assessments and other materials on climate change. These cover topics such as emissions trends, progress towards climate targets, climate impacts, adaptation and public perceptions of climate change.

Recent examples include the Climate Action Progress Report 2026, Trends and Projections in Europe 2026 , and Overheated and underprepared – Europeans' experience of living with climate change. Further climate-related publications are available through the Publications Office of the European Union and the European Environment Agency.

EU institutions also provide climate information through dedicated websites, data platforms and social media. The European Commission's Climate Action website provides information on EU climate policies, legislation, funding, international climate action and opportunities for public participation. Climate-related information is also available through the websites of the Council of the European Union and the European Parliament.

The European Commission also uses social media to communicate developments in EU climate policy, explain legislation and funding programmes, promote events and consultations, and provide information on climate impacts and international climate action. EU Environment and Climate channels are available on platforms including Instagram, LinkedIn, Bluesky, Facebook and YouTube.

Other online platforms provide more specialised climate information. The European Environment Agency provides assessments, data, maps and indicators on climate mitigation, impacts, risks and adaptation. The Copernicus Climate Change Service provides climate data and information on past, present and future climate conditions. Climate-ADAPT provides information and tools to support climate adaptation in Europe.

7.5 Involvement of the public and non-governmental organisations

The EU promotes the involvement of individuals, civil society organisations, businesses, social partners, academia and other stakeholders in the development and implementation of climate policies. Public consultation and stakeholder engagement form part of the European Commission's Better Regulation framework and help ensure transparent and evidence-based policymaking.

Youth Policy Dialogues allow young people to exchange views directly with the European Commission on EU policy initiatives. During the reporting period, several dialogues addressed climate policy, preparations for COP30 and climate resilience. They brought together young people from across Europe to discuss climate priorities and provide input to EU policymaking.

Individuals and stakeholders can contribute to European Commission initiatives through public consultations and other feedback mechanisms on the Have Your Say

portal. These opportunities are available at different stages of the policy cycle, including the preparation of new initiatives and the evaluation or review of existing legislation.

During the reporting period, consultations covered several areas of climate policy. One example was the public consultation, held from December 2025 to February 2026, on the future European climate resilience and risk management framework. It invited businesses, public authorities and other organisations to provide views on how the EU can better prepare for and manage climate risks.

The European Commission also engages directly with stakeholders through targeted dialogues, roundtables and other events. For example, in May 2026 it organised a high-level stakeholder roundtable on the review of the EU emissions trading system. Participants included representatives of industry, civil society and other organisations, and their input contributed to preparations for the review.

This national communication was prepared in close cooperation with experts from relevant European Commission services and other EU institutions. No public consultation specifically on the preparation of this national communication was carried out.

7.6 International cooperation

The EU supports international cooperation on education, training, public awareness, public participation and access to information in line with Article 6 of the Convention, Article 12 of the Paris Agreement and the Glasgow work programme on Action for Climate Empowerment.

The EU participates in UNFCCC negotiations and activities on Action for Climate Empowerment, which covers education, training, public awareness, public participation, public access to information and international cooperation. During the reporting period, these activities contributed to the implementation of the Glasgow work programme on Action for Climate Empowerment and its four-year action plan, including through exchanges of experience and good practice among parties and stakeholders.

The EU also participated in the mid-term review of the Glasgow work programme, initiated at the sixty-second session of the subsidiary body for implementation (SBI 62) in 2025. The review assesses progress in implementing the work programme and identifies opportunities to strengthen future Action for Climate Empowerment activities. The EU also took part in Action for Climate Empowerment-related events at COPs and meetings of the UNFCCC subsidiary bodies, providing opportunities to exchange experience on climate education, public participation, youth engagement and climate communication.

Information integrity has also become an important part of international cooperation on climate communication. The Declaration on Information Integrity on Climate Change was launched at COP30 in Belém in 2025, and the EU authorised its signature in

January 2026. The declaration promotes access to reliable and evidence-based information on climate change and international cooperation to address misinformation and disinformation.

The EU also supports education, training, public awareness and capacity building through its **international partnerships and development cooperation programmes**. These activities help partner countries strengthen institutions, improve access to climate knowledge and develop the skills and expertise needed to support mitigation and adaptation.

One example is the Euroclima programme, which supports cooperation between the EU and countries in Latin America and the Caribbean. It promotes policy dialogue, institutional capacity building, knowledge exchange and access to climate finance. Euroclima forms part of the EU's wider Global Gateway strategy.

The EU also supports specialised initiatives such as ClimEd. The project strengthens education and training on climate services and supports the use of climate information for adaptation and mitigation. In this way, it helps build the knowledge, skills and institutional capacity needed for climate action in partner countries.

8 Improvements in reporting

Table 27 provides an overview of the areas of improvement identified by the technical expert review team during the review of the EU's first BTR, and how the EU has addressed these areas of improvement during the preparation of its second BTR.

Table 27: Implementation of areas of improvement

Area of improvement	Implementation during the preparation of the second BTR
Identification of most significant policies and measures (recommendation 11.1.a)	The process of identifying the most significant policies and measures is described in Section 3.5.2 of this BTR.
Report consistent information between narrative and tabular format (recommendation 11.1.b)	Information on policies and measures in Section 3.5 of the BTR and in CTF table 5 has been corrected where needed, for consistency.
Details on costs, non-GHG benefits and interactions (encouragement 11.2)	Information on costs, non-GHG benefits and interactions has been provided, where available. However, for many policies and measures, such information is not available at EU level because they are implemented at Member State level.
Estimates of expected emission reductions (recommendation 11.3)	Expected emission reductions have been provided where available. Where such information is not available, explanations have been provided for the various mitigation policies and measures in Chapter 3.5.
General description of the methodologies used for estimating emission reductions (recommendation 11.4)	The description of the methodologies used has been extended in Section 3.5. For individual policies and measures, links to impact assessment documents are provided, where specific methodologies are described.

Area of improvement	Implementation during the preparation of the second BTR
Detailed information on the sensitivity analysis (recommendation 13.1)	Section 3.7.4 of the BTR provides information on the parameters that vary in the various sensitivity scenarios.
Description of the systems and processes used to identify, track and report on support provided (recommendation 15.1)	The description of the systems and processes was improved in Section 5.3 of the BTR.
Use the term 'disbursed' instead of 'provided' for EIB finance (recommendation 16.1.a)	The term 'disbursed' is used consistently in the CTF tables.
Provide more transparent information on how the finance is determined to be concessional (recommendation 16.1.b)	Information on how finance is determined to be concessional can be found in Section 5.2 of this BTR.
Address the needs of developing countries (recommendation 16.1.c)	Section 5.3 of the BTR provides information on how the needs and priorities of developing-country parties for the implementation of the Paris Agreement are addressed.
Provide grant-equivalent values for multilateral support provided (encouragement 18.1)	Information on grant equivalent finance is determined can be found in Section 5.2 of this BTR.
Provide information on inflows or explain why the reporting of such information is not applicable (recommendation 18.2.a)	In Section 5.3 of the BTR, an explanation was provided for why reporting on inflows is not applicable. It is because, at the level of the EU, all multilateral finance is disbursed by the European Investment Bank and is reported based on outflows.
Align the terminology used for the status of climate finance with that in paragraph 124(g) of the MPGs (recommendation 18.2.b)	The term 'disbursed' is used consistently in the CTF tables.
Use the correct notation key ('UA') to report when information is not available. (recommendation 18.2.c)	In the CTF tables, the notation key 'UA' is used where applicable.
Specify the type of loan under financial instrument, noting that a concessional loan is a different instrument than a non-concessional loan (recommendation 18.2.d)	Section 5.2 and 5.4 of this BTR provide information on the type of financial instrument.

In addition to the areas of improvement identified by the technical expert review team, the second BTR contains various improvements identified by the Party, such as more extensive information on national circumstances, and information on new mitigation policies and measures.

Annex I: Methodology used to identify GHG emissions from international aviation and navigation within the scope of the EU's NDC

The scope of the EU's NDC goes beyond national GHG emissions and removals in national GHG inventories; 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 using the Joint Research Centre's Integrated Database of the European Energy System (JRC-IDEES). This allows a split of international transport CO_2 emissions into intra-EU/extra-EU and intra-EEA/extra-EEA categories going back in time (i.e. 1990)[122]. 'EEA' here stands for the European Economic Area, comprising the 27 EU Member States, Iceland, Liechtenstein and Norway.

For international transport, JRC-IDEES uses 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 between domestic, intra-EU/intra-EEA and extra-EU/extra-EEA activity for each EU Member State, Norway and Iceland.

In aviation, JRC-IDEES distinguishes between passenger and freight modes, with three geographical categories of flight origin/destination for each mode: domestic, intra-EEA plus the UK, and extra-EEA plus the UK. The intra-EU, UK and EEA categories are also used internally during calibration but are aggregated for reporting. For each mode/category combination, JRC-IDEES estimates activity (as passenger-kilometres or tonne-kilometres), 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 breakdown first allocates EU-level activity data from the Transport Pocketbook 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

[122] 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, emissions in the database include emissions related to the UK but not those related to Switzerland, for which total CO_2 emissions for the scope are estimated using EUROCONTROL data and then added.

common load factor across all Member States to account for mixed passenger/freight flights.

Next, the decomposition produces an estimate of 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 process described above is followed throughout the entire decomposition period (1990-2021). Data gaps are estimated from the existing indicators as described below.

- The process iterates back in time towards 1990, starting from the earliest years for which data are available in each Member State.
- Average flight distance is kept constant for the early years lacking 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 are 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 lacking 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 (i.e. before 1995 for Transport Pocketbook data; before 2004 for EUROCONTROL data).

For international maritime transport, JRC-IDEES estimates data for both 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 (in tonne-km) is estimated from Eurostat data on gross weight of transported goods, using port-level and country-level data for the 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 through the monitoring, reporting and verification system for maritime transport under the EU ETS (THETIS MRV): EU-level mileage data and country-specific vessel sizes to estimate load factors (tonnes per movement). The load factors and resulting annual mileage (in kilometres) 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 to minimise discrepancies with total intra-EU THETIS MRV emissions. As with aviation, JRC-IDEES reports corresponding differences to submissions under the UNFCCC. Early years lacking data are estimated from existing indicators as follows.

- The process iterates back in time towards 1990, starting from the oldest years for which data are available in each Member State.
- The average distance of journeys is kept constant for early years lacking Eurostat activity data (generally those before 1997).
- If the load factor (tonnes per movement) cannot be estimated due a lack of activity data, it is kept constant.
- If activity data are not available, they are estimated from Eurostat energy consumption.
- Missing mileage data are derived from the activity and load factor estimates.
- For early years lacking 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 THETIS MRV mileage, and iii) scale domestic and intra-EU CO_2 emissions estimated from energy consumption, 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 years 2022, 2023 and 2024, international navigation and aviation emissions within the scope of the EU NDC have been estimated by applying the same share of those emissions in total international navigation and aviation emissions (as reported in the GHG inventory) as was observed in 2021.

The following table provides an overview of the resulting net GHG emissions within the scope of the NDC.

Table 28: Summary of GHG emissions within the scope of the NDC ($ktCO_2$-eq)

Year	Net domestic GHG emissions	International aviation within the scope of the NDC	International navigation within the scope of the NDC	Total net GHG emissions within the scope of the NDC
1990	4 608 535	23 879	30 206	4 662 620
1991	4 404 856	23 359	29 485	4 457 701
1992	4 284 248	24 661	30 368	4 339 277
1993	4 183 091	26 025	30 773	4 239 888
1994	4 163 281	27 546	30 659	4 221 487
1995	4 186 708	28 351	30 956	4 246 015
1996	4 261 669	28 800	32 565	4 323 035

1997	4 195 858	29 952	34 739	4 260 549
1998	4 157 156	31 448	36 143	4 224 747
1999	4 074 465	33 946	36 101	4 144 512
2000	4 106 798	34 921	38 082	4 179 801
2001	4 100 489	34 881	37 698	4 173 068
2002	4 096 534	33 034	37 534	4 167 102
2003	4 205 764	35 090	38 505	4 279 358
2004	4 178 779	38 028	39 844	4 256 651
2005	4 154 437	39 091	38 816	4 232 344
2006	4 149 063	41 529	39 815	4 230 407
2007	4 150 301	43 393	40 853	4 234 547
2008	4 005 654	43 550	39 679	4 088 882
2009	3 708 367	38 692	37 900	3 784 960
2010	3 790 355	38 223	38 678	3 867 255
2011	3 688 598	40 083	39 052	3 767 733
2012	3 605 034	39 241	36 731	3 681 007
2013	3 528 618	39 333	35 075	3 603 027
2014	3 407 149	40 936	33 712	3 481 796
2015	3 457 698	42 995	33 029	3 533 722
2016	3 469 264	46 869	35 354	3 551 486
2017	3 546 777	49 291	35 567	3 631 635
2018	3 493 470	52 143	36 564	3 582 177
2019	3 338 230	52 326	36 893	3 427 449
2020	3 044 079	17 979	30 699	3 092 757
2021	3 226 662	23 322	33 214	3 283 198
2022	3 141 580	43 191	36 892	3 221 663
2023	2 872 832	47 650	35 828	2 956 310
2024	2 786 203	51 539	35 076	2 872 818

Source: GHG inventory of the EU; calculations based on JRC-IDEES, EUROCONTROL and THETIS MRV as described above.

Annex II: Cooperation with Iceland, Liechtenstein and Norway under the EEA Agreement and with Northern Ireland under the Protocol on Ireland/Northern Ireland

ETS

Emissions covered by the EU ETS account for a bit less than 40% of the EU's total greenhouse gas emissions. The EU ETS covers more than 12 500 entities, including around 8 600 installations in the power and heat sector and manufacturing industry. The EU ETS is in operation in all 27 EU Member States and in the participating EFTA States Iceland, Liechtenstein and Norway. In Northern Ireland, it applies to electricity generation.

The system also covers aviation within the EU, Norway and Iceland, and departing flights to Switzerland and the United Kingdom. In parallel, the EU implements the international Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) through the EU ETS Directive. CORSIA is applied to relevant international flights outside the EEA, Switzerland and the UK between participating countries and requires EU-based aircraft operators to offset emissions above the scheme's baseline, which is 85% of 2019 emissions.

Effort Sharing Regulation (ESR)

The Effort Sharing Regulation (ESR) covers greenhouse gas emissions from domestic transport, buildings, agriculture, small industry, and waste. Together, these emissions account for 66% of the EU's domestic emissions.

Land Use, Land Use Change and Forestry (LULUCF) Regulation

The land use, land-use change, and forestry (LULUCF) Regulation includes greenhouse gas emissions and removals from land, including soils and forests, in the 2030 climate and energy framework of the Union. The LULUCF sector in the Union absorbs more greenhouse gases than it emits and the Regulation aims at further enhancement of carbon removals by introducing 2030 national net removal targets.

2030 Nationally determined contributions (2030 NDCs)

In its 2030 nationally determined contribution (NDC), the EU identifies the EU ETS, the Effort Sharing regulation and the LULUCF regulation as its main mitigation policies and measures to achieve its 2030 target, supported by other sector specific policies and actions.

Norway, Iceland and Liechtenstein also include the EU ETS among their policies and measures supporting the implementation of their 2030 NDCs.

The EU 2030 NDC includes emissions from civil aviation activities as set out for 2030 in Annex I to the EU ETS Directive. Emissions are included in the NDC 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. It also includes waterborne navigation in respect of CO_2, methane (CH_4) and nitrous oxide (N_2O) emissions from maritime transport voyages between the EU Member States.

Emissions from international aviation and maritime transport are reported separately from the national total in the GHG inventory.

The scope of the EU ETS means there is more climate action than is reported in national inventory totals. The coverage of the EU ETS coincides with the EU's NDC for these emissions, which means it also has higher ambition than national inventory totals.

The EU methodology for estimating aviation and maritime emissions included in the EU's NDC scope is detailed in the Annex I: 'Methodology used to identify GHG emissions from international aviation and navigation within the scope of the EU's NDC'.

Cooperation with Iceland, Liechtenstein and Norway under the EEA agreement and with Northern Ireland under the Protocol on Ireland/Northern Ireland

ETS

The 27 European Union Member States, Iceland, Liechtenstein and Norway implement the EU Emissions Trading System (EU ETS) under Directive 2003/87/EC. The Directive was incorporated into point 21al into Annex XX of the Agreement on the European Economic Area (EEA Agreement), by Decision No 146/2007 of 26 October 2007 of the EEA Joint Committee. Electricity generators in Northern Ireland are covered under the Protocol on Ireland/Northern Ireland now referred to the Windsor Framework forming part of the EU-UK Withdrawal Agreement. This is without prejudice to how the EU, Iceland, Liechtenstein and Norway implement the Paris Agreement. The EU, Iceland, Liechtenstein, Norway and the United Kingdom each have separate NDCs under the Paris Agreement.

The EU ETS is a common policy and measure implemented by the participating Parties. It sets a single cap on issued allowances covering activities across participating jurisdictions. Iceland, Liechtenstein and Norway implement the relevant provisions of the EU ETS through their respective national legal frameworks.

Each Party reports greenhouse gas emissions occurring within its territory in its national greenhouse gas inventory, in accordance with the applicable IPCC guideline and describes its participation in the EU ETS among its policies and measures in its Biennial Transparency Report.

ESR and LULUCF

Regulation (EU) 2018/841 (LULUCF) and Regulation (EU) 2018/842 (ESR) have been implemented by Iceland and Norway (without the participation of Liechtenstein) in cooperation with the EU 27 since 2019. They were incorporated in Protocol 31 of the EEA Agreement by Decision 269/2019 of the EEA Joint Committee.

Iceland and Norway participate in the Effort Sharing instrument, with national targets for the reduction of emissions in the ESR sectors by 2030. Under LULUCF, the cooperation concerns enhancement of carbon removals generated by their LULUCF sectors. The cooperation of Iceland and Norway has been taking place under the conditions of the ESR and LULUCF Regulations as adopted in 2018. Currently, it is being reviewed and updated following the 2023 amendments of both pieces of legislation which increased the ambition of the 2030 national targets.

Under the ESR, Iceland and Norway may transfer to, or acquire from, EU Member States annual emission allocations. So far, no such transfers have been carried out. Similarly, under the LULUCF, Iceland and Norway may transfer land removal units to

and from EU Member States. Transfers of these LULUCF credits may take place during the compliance exercise in 2027.

ETS, ESR and LULUCF and the parties' NDCs

Under decision 2/CMA.3 a cooperative approach is a voluntary cooperation between Parties. Participation in the EU ETS, in the Effort Sharing and in the LULUCF instruments, does not constitute an authorisation or international transfer of mitigation outcomes under article 6.2 of the Paris Agreement. Internationally transferred mitigation outcomes (ITMOs) occur only when the participating parties authorise them under a specific voluntary cooperative approach in accordance with decision 2/CMA.3.

The common ETS is not based on a cooperation under article 6.2 of the Paris Agreement. Therefore, it does not imply transfer of Internationally transferred mitigation outcomes (ITMOs). That is also the case of the transfers of annual emission allocations and the land removal units under the ESR and LULUCF respectively.

To date, no cooperative approach under article 6.2 of the Paris Agreement has been agreed between the EU, Iceland and Norway either concerning the EU ETS, or the ESR or LULUCF regulations. Until a cooperative approach is agreed, and the relevant authorisations are given, no transfers can be reported as ITMOs and no corresponding adjustment can be applied.