European Environment Agency

European Union 8th Environment Action Programme

Monitoring report on progress towards the 8th EAP objectives 2023 edition

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Executive summary

The 8th Environment Action Programme (EAP) is the EU's legally agreed-upon, overarching framework for action on EU environmental policy until 2030.

The programme includes a long-term priority objective for 2050 of living well within planetary boundaries. It also sets out six thematic priority objectives for 2030 and the conditions needed to achieve these. It builds on the European Green Deal and aims to accelerate the green transition, as well as to protect, restore and improve the state of the environment.

The 8th EAP Decision requires progress towards attaining the 8th EAP objectives to be monitored annually, taking into account the enabling conditions and the overall goal of systemic change.

The priority objectives, the enabling conditions and the monitoring framework and governance of the 8th EAP as stipulated in the 8th EAP Decision are described in Annex 1.

The EEA takes stock of progress towards the 8th EAP objectives annually, based on a set of 28 headline indicators and corresponding monitoring targets. This report is the first of the annual series.

The European Commission selected the indicators and targets after broad consultation with stakeholders, Member States and the EEA. They represent key aspects of the 8th EAP and were outlined in the European Commission communication on the 8th EAP monitoring framework.

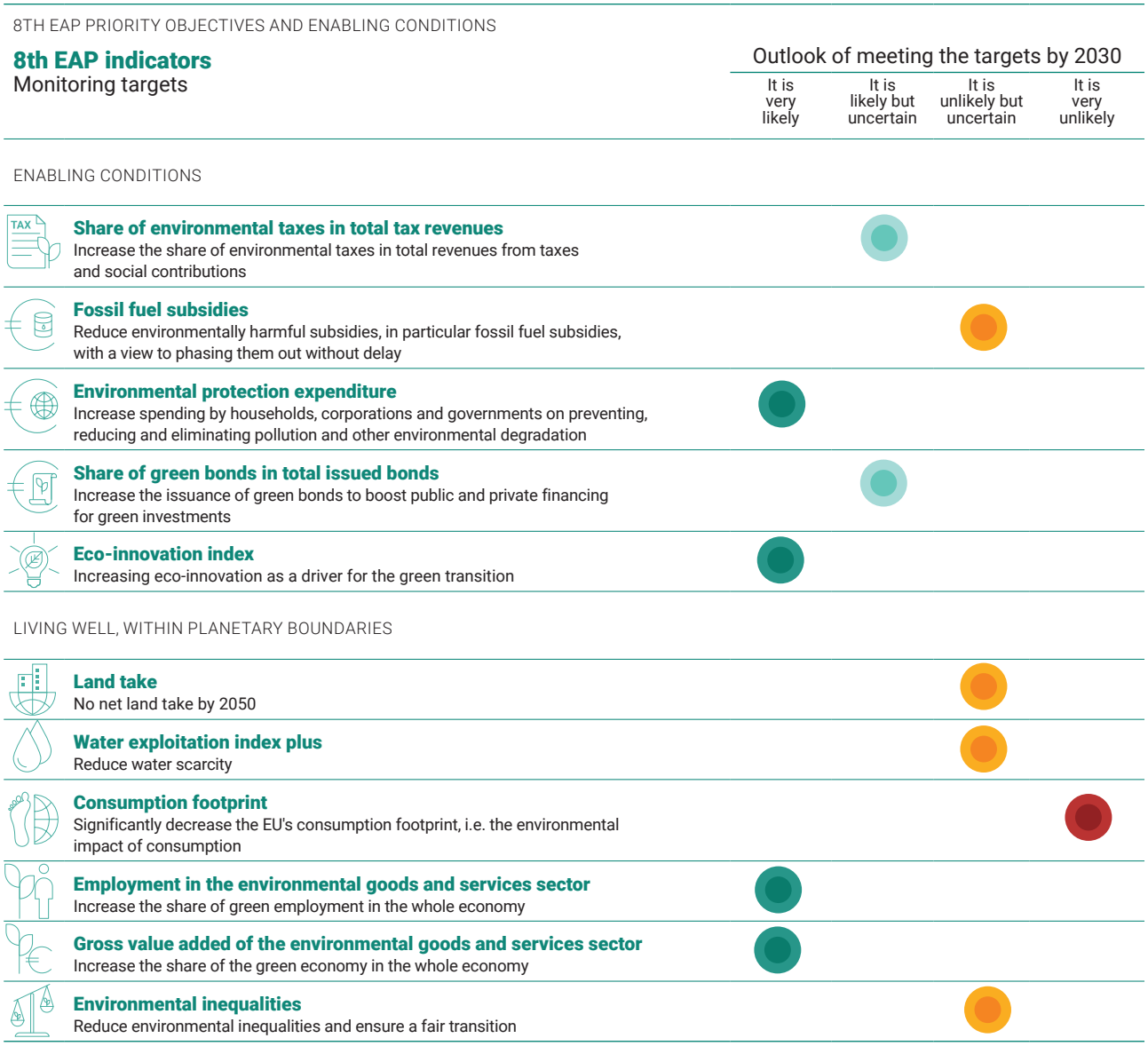
The EEA developed and applied a methodology to assess the prospects of meeting the 28 monitoring targets by 2030, based on the expected direction of the corresponding 28 ([i]) 8th EAP headline indicators, described in Annex 2.

The headline indicators, their targets and the prospects of meeting them by 2030 are presented in the form of a scoreboard in Table ES.1. Specifically, the table presents the indicators and corresponding targets in each of the six thematic priority objectives, the long-term priority objective and the enabling conditions in line with the Communication on the 8th EAP monitoring framework.

([i]) The European Commission Communication on the 8th EAP monitoring refers to 26 headline indicators and targets. This is because two of the headline indicators (and associated targets) are doubles. Specifically, the indicator on designated protected areas is two indicators: one on terrestrial and one on marine protected areas with separate targets. The indicator on the environmental goods and services sector is also two distinct indicators and targets: one on employment and one on gross value added of the environmental goods and services sector.

Table ES.1 8th Environment Action Programme monitoring results, 2023

8TH EAP PRIORITY OBJECTIVES AND ENABLING CONDITIONS **8th EAP indicators** Monitoring targets	Outlook of meeting the targets by 2030 It is very likely	It is likely but uncertain	It is unlikely but uncertain	It is very unlikely
CLIMATE CHANGE MITIGATION				
Greenhouse Gas Emissions Reduce net GHG emissions by at least 55% by 2030 from 1990 levels		●		
GHG emissions from land use, land-use change and forestry Increase net GHG removals by carbon sinks from the LULUCF sector to -310 million tonnes CO_2 equivalent by 2030				●
CLIMATE CHANGE ADAPTATION				
Climate-related economic losses Reduce overall monetary losses from weather and climate-related events			●	
Drought impact on ecosystems Decrease the area impacted by drought and loss of vegetation productivity			●	
A REGENERATIVE CIRCULAR ECONOMY				
Raw material consumption Significantly decrease the EU's material footprint, by reducing the amount of raw material needed to produce the products consumed in the EU			●	
Total waste generation Significantly reduce the total amount of waste generated by 2030			●	
ZERO POLLUTION AND A TOXIC FREE ENVIRONMENT				
Premature deaths due to exposure to fine particulate matter Reduce premature deaths from air pollution by 55% (from 2005 levels) by 2030	●			
Nitrates in groundwater Reduce nutrient losses by at least 50% in safe groundwater resources			●	
BIODIVERSITY AND ECOSYSTEMS				
Designated terrestrial protected areas Legally protect at least 30% of the EU's land area by 2030			●	
Designated marine protected areas Legally protect at least 30% of the EU's sea area by 2030			●	
Common bird index Reverse the decline in populations of common birds			●	
Forest connectivity Increase the degree of connectivity in forest ecosystems with a view to creating and integrating ecological corridors and increase climate change resilience			●	
ENVIRONMENTAL AND CLIMATE PRESSURES RELATED TO EU PRODUCTION AND CONSUMPTION				
Energy consumption Reduce by 2030 the primary and the final energy consumption levels to respectively 992.5 and 763 million tonnes of oil equivalent				●
Share of renewable energy in gross final energy consumption At least 42.5% of energy from renewable sources in gross final energy consumption by 2030			●	
Circular material use rate Double the ratio of circular material use by 2030 compared to 2020				●
Share of buses and trains in inland passenger transport Increase the share of collective transport modes (buses, coaches and trains)			●	
Area under organic farming 25% of EU agricultural land organically farmed by 2030				●



Note: The 8th EAP indicators and monitoring targets were outlined in the European Commission Communication on the 8th EAP monitoring framework (COM(2022)357).

Key messages from the 8th EAP scoreboard by priority objective and enabling conditions

- **Climate change mitigation**

The 8th EAP mirrors the vision of the European Green Deal to make Europe the world's first climate-neutral continent by 2050 through a just transition that leaves no one behind. It aims to reduce the EU's net greenhouse gas (GHG) emissions as well as to enhance carbon removal in the land use, land-use change and forestry sector (LULUCF).

The climate legislation now adopted under the Fit for 55 package establishes the necessary framework for the EU to meet its target of a 55% domestic reduction in net GHG emissions by 2030 from 1990 levels. There is an ongoing strengthening of policies by Member States and an expected gradual acceleration in the reduction of GHG emissions over the next few years. Projections reported by Member States

in March 2023 indicate that current and planned policies and measures are not yet sufficient to meet the 2030 net emission target.

At the same time, achieving the 2030 target on carbon removals in the LULUCF sector is expected to be difficult. The latest Member State projections based on the current and planned policies and measures fall quite short of the target, while the past 10-year trend is mostly going in the wrong direction and will have to be reversed.

Both the emission reduction and LULUCF targets are ambitious and have been agreed upon recently. Member States are still in the process of updating their National Energy and Climate Plans; in that context, they are continuing to develop policies and measures to close the gap between current projection levels and the target. Strengthened policies and measures would need to address all socio-economic sectors for the targets to be met.

- **Climate change adaptation**

The 8th EAP requires continuous progress in enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change.

It seems unlikely that the two monitoring targets for this 8th EAP priority objective will be met by 2030. The two targets are about reducing the overall monetary losses from weather- and climate-related events, and decreasing the area impacted by drought and loss of vegetation productivity.

The implementation of the EU and national climate change adaptation strategies is expected to positively affect the adaptive capacity to deal with impacts of climate change in Europe. However, the latest Intergovernmental Panel on Climate Change assessment reports project that many weather- and climate-related extreme events, such as floods, droughts and heatwaves, will become more frequent and severe in Europe and around the world. It will be important to put in place comprehensive, integrated approaches to enhance adaptive capacity and to increase societal resilience against climate change.

- **A regenerative circular economy**

The 8th EAP aims towards a regenerative circular economy that gives back to the planet more than it takes.

It seems unlikely that the targets of significantly decreasing the material footprint and the total amount of generated waste will be met by 2030.

Economic growth has been a key driver behind the trends of both material footprint and total waste generation. Legislation already in place to prevent waste generation and to sustainably manage waste, including to recycle and re-use materials, has only partially succeeded in decoupling raw material consumption and waste generation from economic growth. Significant additional efforts to reduce consumption where necessary and to move further towards a circular economy are needed to reach the 2030 targets.

- **Zero pollution and a toxic-free environment**

The 8th EAP pursues a zero pollution aim to achieve a toxic-free environment.

It is very likely that the 2030 target of reducing premature deaths from air pollution (measured by those attributed to fine particulate matter) by at least 55% compared to 2005 levels will be met. Extrapolating the progress of the past 10 years shows that the target will be significantly overreached. Projections by the European Commission also show that the target will be significantly overreached if EU policies on air, climate and

energy are adequately implemented. Despite the ongoing improvement, there were 253,000 premature deaths attributable to fine particulate matter in the EU in 2021.

It seems unlikely that the target on reducing by at least 50% nutrient losses into groundwater will be met by 2030. This is due to lack of progress in reducing nutrient losses, especially from agriculture, despite legislation in place. Some progress is nevertheless expected by 2030 because of new initiatives under the European Green Deal.

- **Biodiversity and ecosystems**

The 8th EAP aims to protect, preserve and restore Europe's biodiversity.

It seems unlikely that any of the four biodiversity and ecosystem-related monitoring targets selected for this priority objective will be reached by 2030. The targets are reversing the decline in populations of common birds, increasing the degree of connectivity in forest ecosystems, and legally protecting at least 30% of the EU's land area and at least 30% of the EU's sea area by 2030.

A key reason is high pressure on land and sea use arising from socio-economic sectors such as agriculture, fisheries and urbanisation. To meet the targets, Member States must better implement existing legislation, take new measures to restore biodiversity and further mainstream biodiversity into other policies such as the common agricultural and fisheries policies.

- **Environmental and climate pressures related to EU production and consumption**

The 8th EAP aims to promote environmental aspects of sustainability and significantly reduce key environmental and climate pressures related to the EU's production and consumption.

It is very unlikely that the 2030 targets on energy efficiency will be met. These include reducing the primary and final energy consumption levels to 992.5 and 763 million tonnes of oil equivalent, respectively. It is also very unlikely that the 2030 targets on doubling the circular material use rate from 2005 levels and on reaching at least 25% of EU agricultural land under organic farming will be met.

It seems unlikely that the 2030 targets on reaching at least 42.5% of energy from renewable sources in gross final energy consumption and on increasing the share of collective passenger transport (buses, coaches and trains) will be met.

A common denominator across all five indicator assessments is the extent of the required change, the high speed at which this needs to take place and the need for a deep transformation of the systems that underpin these five areas. Reducing consumption, energy and material needs, and enabling sustainable choices for consumption, energy use, food and mobility are key determinants of success.

- **Living well within planetary boundaries**

The 8th EAP requires that, by 2050, EU citizens live well within the limits of the planet in a wellbeing economy.

It is very likely that the targets of increasing the share of green economy and share of green employment in the whole economy will be met by 2030. This is because the need to fulfil the high level of ambition of the environment and climate policy of the European Green Deal in the context of the EU's ongoing green transition will most likely further drive these shares up.

It is very unlikely that the target of significantly decreasing the EU's consumption footprint will be met by 2030. Projections by the European Commission show that, based on current consumption patterns and expected economic growth, the EU will not reduce its consumption footprint in the coming years.

It seems unlikely that the targets of staying on track to reach the 2050 EU goal of 'no net land take' and of reducing both water scarcity and environmental inequalities will be met by 2030. Projections show that built-up areas will expand in the EU by 2030, hampering the EU's prospects of achieving the 2050 'no net land take' goal. The pressure of climate change may further reduce water availability, making it challenging to reduce ongoing water scarcity in the coming years. Finally, although income-related environmental inequalities associated with air pollution are an imperfect proxy for environmental inequalities, it is important to note that it seems unlikely that this indicator will show improvements in the coming years.

- **Enabling conditions**

To meet the priority objectives of the 8th EAP, many enabling conditions would need to be fulfilled.

It is very likely that the targets of increasing eco-innovation and environmental protection expenditure will be met by 2030. It is expected that eco-innovation will increase further in the coming years, because the high ambition of the environment and climate objectives of the European Green Deal and its ensuing initiatives have created favourable conditions. It is expected that environmental protection expenditure will also increase further in the coming years because additional resources have been made available to this effect in the EU budget, and in grants and loans under the EU Recovery and Resilience Facility.

It seems likely that the targets of increasing the shares of environmental taxes in total revenues from taxes and social contributions, and of green bonds in total issued bonds, will be met by 2030. The increased ambition and scope of emissions trading may contribute to a rise in the share of environmental taxes. Additionally, the EU's heightened environmental and climate ambition and improved framework conditions for sustainable finance may further increase the share of green bonds.

It seems unlikely that the amount of fossil fuel subsidies will be reduced in line with the 8th EAP ambition to phase them out without delay. At present, most EU countries lack concrete phase-out plans.

In conclusion

The assessment of the prospects of meeting the aforementioned 2030 targets point to the need for decisive and urgent action to protect and restore Europe's environment, mitigate climate change and better adapt to changing conditions. Research shows that the EU and the world have already transgressed several planetary boundaries.

A number of the 8th EAP targets reflect the heightened ambition of the environment and climate policy driven by the European Green Deal. The targets relating to climate change mitigation and energy have been adopted only recently. Therefore, Member States are still in the process of aligning their policy measures and ambitions with the updated European objectives.

The extent and speed of the change required to meet the targets should not be ignored: several of the indicators ([ii]) point to a required increase in pace of between twofold and ninefold in the years leading to 2030, compared to the pace of the last 10 years.

The 2030 indicator outlook results related to the 8th EAP priority objective on 'environmental and climate change pressures related to EU production and consumption' are the most concerning. The pace of change for most of these indicators will have to increase substantially in the coming years while the indicators address key aspects of energy, mobility, food and material resource use systems. This points to the need for a deep transformation of these systems.

The 2030 indicator outlook results related to the 8th EAP 'enabling conditions' are the most positive. These do not, however, seem to have been enough to effect the necessary change towards meeting the 8th EAP priority objectives. The green transition would require unprecedented investment, with current European Commission estimates pointing to annual additional investment needs in the period of 2021 to 2030 of more than EUR 620 billion to meet the objectives of the European Green Deal and REPowerEU. Increases in the EU budget, the creation of the Recovery and Resilience Facility and several sustainable finance actions are expected to trigger additional capital flows in Member States towards sustainable investment. It remains to be seen if this will be enough to fill the investment gap by 2030.

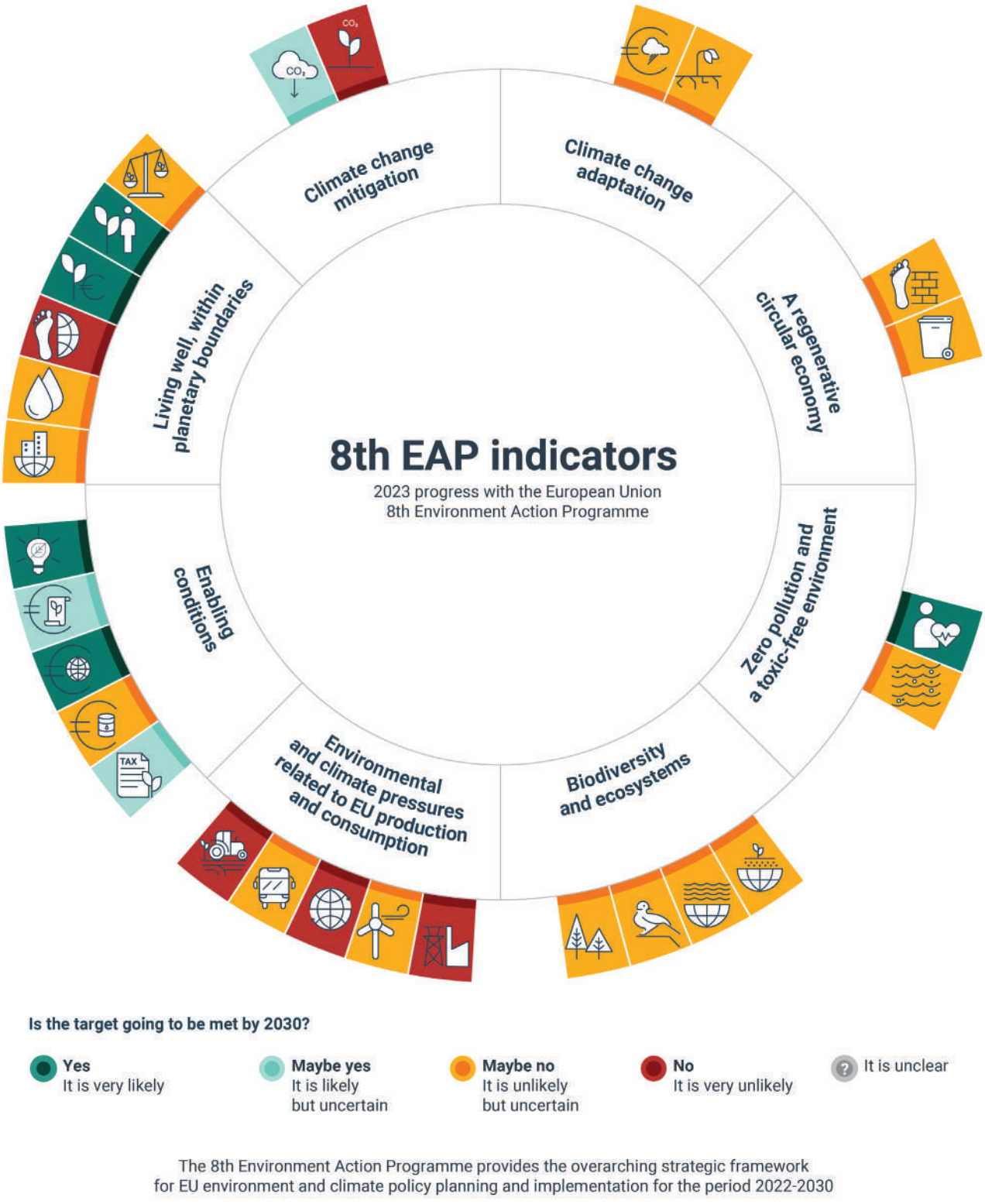
The 8th EAP monitoring report with its indicators cannot capture various aspects of enabling conditions such as governance, public awareness or social considerations. This may distort the picture that emerges in the 8th EAP scoreboard in relation to the enabling conditions.

Overall, strengthening the implementation of existing legislation, bringing forward additional policies and measures when necessary and mainstreaming environment and climate change related policies into other policy areas is urgently needed. There may also be a need for a deeper reflection on the dynamics at play and why, despite existing legislation, the EU still faces challenges in meeting many of its environmental and climate change-related objectives.

This report will provide a snapshot of progress towards the targets associated with the 8th EAP headline indicators annually. The EEA will build on these results in its upcoming flagship *State and Outlook of the Environment Report*, due for publication in 2025.

([ii]) Nine out of the 28 8th EAP headline indicators address quantitative targets. It is therefore possible to quantify in these cases the required pace in the remaining years to 2030 and compare it with that of the last 10 years of available data. In seven out of nine of these indicators, the required pace in the remaining years will need to rise significantly. In the remaining two cases, in relation to marine protected areas, the pace will need to increase by 30%, while for premature deaths attributed to $PM_{2.5}$, the pace will not have to increase.

Figure ES.1 **8th Environment Action Programme scoreboard, 2023**



Source: EEA.

8TH EAP THEMATIC PRIORITY OBJECTIVE

Climate change mitigation

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1 Climate change mitigation

Reducing greenhouse gas emissions and enhancing carbon removals

Addressing climate change is one of the defining challenges of our times. The European Green Deal ([1]) was the blueprint for a transformational change to make Europe the world's first climate-neutral continent by 2050 through a just transition that leaves no one behind. The 8th Environment Action Programme (EAP) ([2]) built on the Green Deal vision and emphasised the achievement of targets on greenhouse gas (GHG) emissions and carbon removal in the land use, land-use change and forestry sector (LULUCF).

To capture progress on climate change mitigation efforts, the European Commission's 8th EAP monitoring framework ([3]) includes two indicators and corresponding 2030 targets:

- An indicator on total GHG emissions to monitor progress on achieving the target of reducing net EU GHG emissions to at least 55% below 1990 levels by 2030.
- An indicator on GHG emissions from LULUCF to monitor whether this sector will be able to remove from the atmosphere the net equivalent of 310 million tonnes of carbon dioxide emissions by 2030 at EU level.

The indicator assessment results are summarised further below. Overall, it will be challenging to meet these two 2030 targets but current policy developments seek to bring them into reach. The GHG projections that Member States submitted to the EEA in March 2023 indicate that existing and planned policies and measures would deliver an aggregated 48% net reduction in GHG emissions, compared to 1990 levels, by 2030. As Member States update their National Energy and Climate Plans by June 2024, they may identify additional measures that close the gap to the 55% target as part of their implementation of the Fit for 55 package ([4]). In terms of progress towards meeting the GHG removal target, while preliminary data for 2022 show an increase in carbon removal, this follows a 10-year decreasing trend.

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

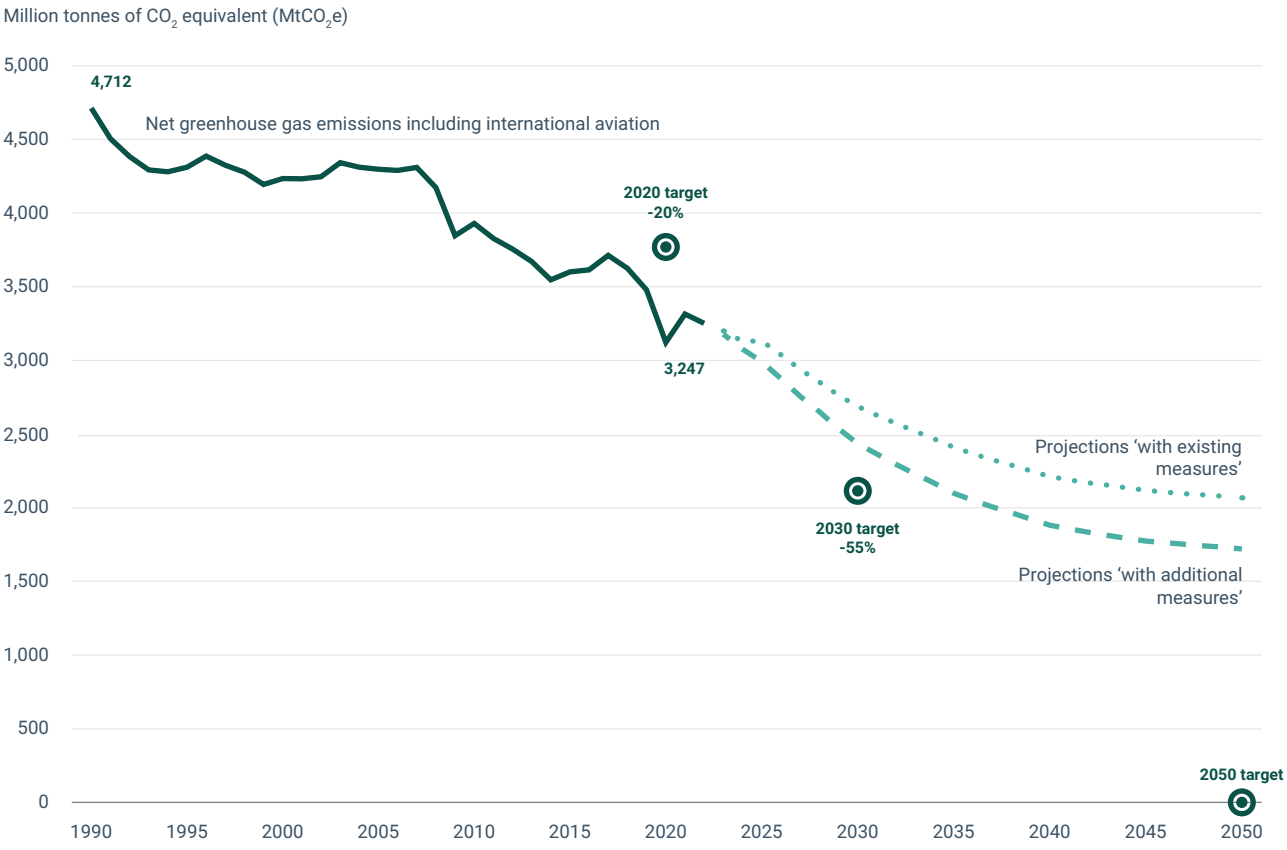
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Greenhouse gas emissions:

Will the EU cut net GHG emissions by at least 55% by 2030 from 1990 levels?

Likely but uncertain. The legally binding measures under the Fit for 55 package create a framework to achieve net GHG emission reductions of 55% by 2030. Considerable acceleration in emission reductions will be needed. It is early to assess whether the target may be reached. Aggregated GHG projections from March 2023 indicate the policies and measures that Member States had adopted and planned at the time of submission would deliver net GHG emission reductions of 48% by 2030. This year's projections may, however, not fully reflect current efforts by the Member States to meet some of the measures under the Fit for 55 package which were adopted in the course of 2023. Member States are in the process of updating their national energy and climate plans, which should lead in identifying additional emission reduction measures and contribute to closing the remaining gap from the current projections to the target.

Figure 1.1 **Total net greenhouse gas emissions and projections, EU**



Source: EEA.

Relevance and policy target

- The reduction of GHG emissions is vital to slow the rate of global warming and mitigate its impact on the environment and on human health.
- The EU is a frontrunner in climate ambition, with the European Climate Law ([5]) setting binding targets to reduce net GHG emissions by at least 55% from 1990 levels by 2030 and to achieve climate neutrality by 2050 in the EU.

Indicator past trend (1990-2022): decrease ↓
Latest value (2022, preliminary): 3,247 million tonnes of net CO_2 equivalent

- Over the 1990-2021 period, net GHG emissions, including from international aviation, fell by 30%, with a further estimated reduction to 31% in 2022.
- The decline since 1990 reflects a shift in energy production methods, with a sharply decreased use of coal and a steadily increasing share of renewable energy. In addition, improved energy efficiency resulted in a reduction in primary energy consumption, while technological innovation led to substantial decreases in GHG emissions linked to specific industrial production processes ([6]).
- In line with the gradual strengthening of policies, a reduction in net GHG emissions has primarily taken place within the past two decades. With the pace of annual emission reductions doubling since 2005 compared to the period from 1990 to 2005, the EU has surpassed its 2020 climate target.

2030 outlook

- Reaching the 2030 climate target demands a further acceleration of emission reductions, requiring a more than threefold increase in the past 10-year average annual rate of net GHG emission reductions.
- At EU level, the Fit for 55 legislation adopted in 2023 should put the EU on track to meet the 55% domestic net GHG reduction target in 2030 compared to 1990, if fully implemented ([7])([8]).
- As of March 2023, Member States projected that their current national policies and measures, with additional planned measures in 18 Member States, would deliver an aggregated 48% reduction in net emissions by 2030, compared with 1990 levels. While this falls short of reaching the target, it reflects an increase in Member State ambition that, in 2022, forecast a 41% reduction in net emissions by 2030. In addition, this year's projections may not fully reflect current efforts by the Member States to meet some of the Fit for 55 Package measures, as these were adopted in the course of 2023 ([9]).
- Member States are currently updating their National Energy and Climate Plans and should deliver final versions in June 2024. These updates should help address the remaining gap to the target.
- Furthermore, the adoption of crucial technologies is rapidly gaining momentum, illustrated by recent and very fast deployment of solar PV, heat pumps and electric cars ([10])([11])([12]). If this trend continues, these technologies will contribute to the required acceleration in emission reduction.

- To meet the target, a significant increase in effort is needed across all socio-economic sectors. In the buildings sector, there is significant cost-effective potential to reduce GHG emissions by 2030. The transport and agricultural sectors also require substantial additional efforts. This includes implementation of planned additional measures in the strategic plans of the Common Agriculture Policy, in order to realise projected emission reductions in line with the 2030 target.

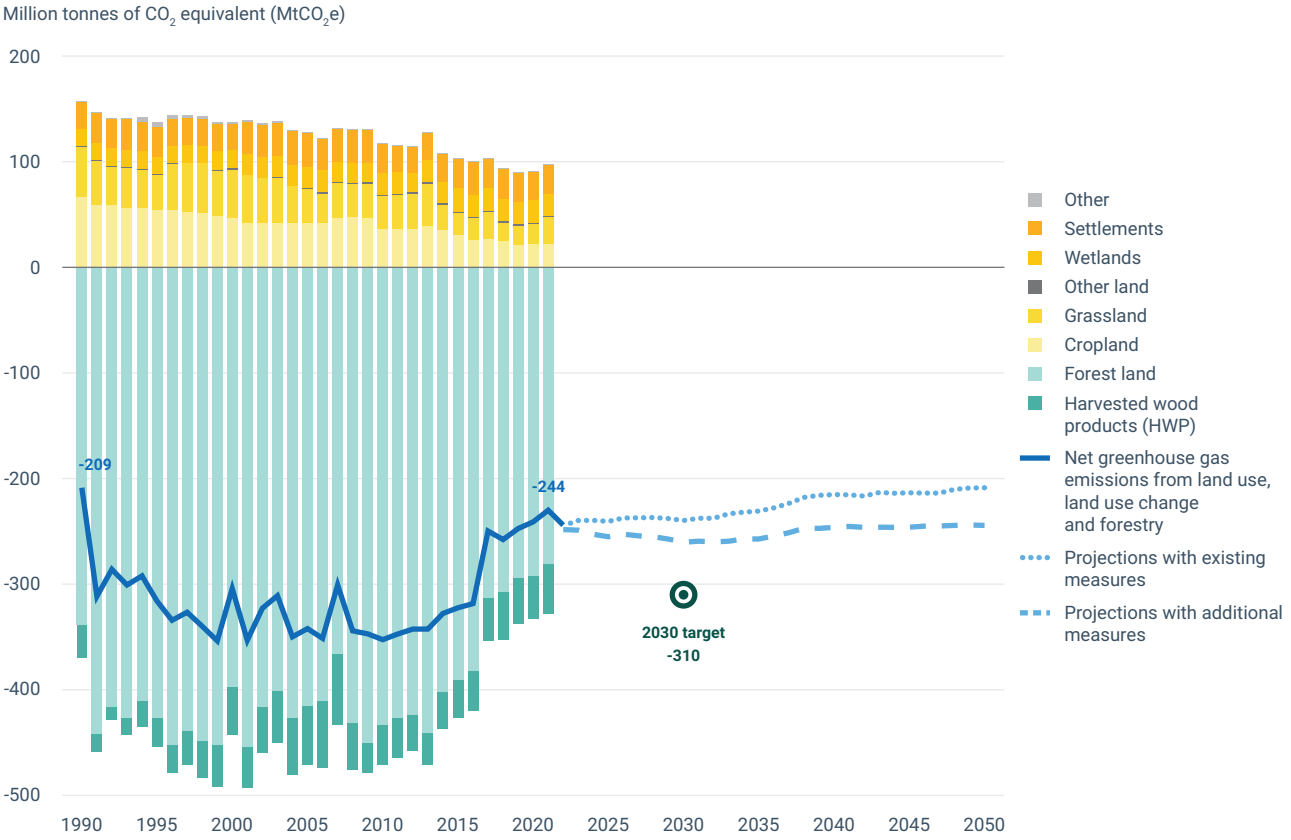
For more references and additional information see the full indicator version.

GHG emissions from land use, land-use change and forestry (LULUCF):

Will the EU increase net GHG removals from the LULUCF sector to -310 million tonnes CO_2 equivalent by 2030?

Very unlikely. In the past 10 years, removal has decreased and Member States' projections show that the planned policies fall short of reaching the target.

Figure 1.2 **Greenhouse gas emissions and removals of the land use, land-use change and forestry sector plus projections, EU**



Source: EEA.

Relevance and policy target

- Mitigating climate change would need both a reduction in greenhouse gas emissions and their removal from the atmosphere to reach climate neutrality by 2050. The land use, land-use change and forestry (LULUCF) sector has the potential to contribute by removing CO_2 from the atmosphere and to reduce emissions in other sectors through substitution.

- The LULUCF Regulation ([13]) sets a net removal target from the sector of 310 million tonnes of CO_2 equivalent ($MtCO_2e$) by 2030.

Indicator past trend (2012-2022): decrease ↓
Latest value (2022, preliminary): 244 million tonnes of removed CO_2 equivalent

- In 2021, the EU's LULUCF sector accounted for the net removal of 230 $MtCO_2e$, equal to 7% of the EU's total GHG emissions. CO_2e removal has decreased in the past 10 years instead of increasing. This was mainly because of increased harvest of wood, partly driven by increased salvage logging and ageing forests as well as the lower sequestration of carbon by ageing forests in some Member States. Nevertheless, preliminary estimates of removal show an increase to 244 $MtCO_2e$ for 2022.

2030 outlook

- It is very unlikely that the target will be met unless additional fast-response mitigation measures are implemented.

- Reaching the target would require reversing the past trend.

- Member State projections submitted in 2023 that take into account existing and intended additional measures suggest that net removal will amount to 240-260 $MtCO_2e$ by 2030 ([14]). Despite this increase, the projected removals by 2030 will still fall short of the target by at least 50 $MtCO_2e$. As the target came into force only on 30 May 2023, some countries may have not yet started establishing the requisite measures and reflecting them in their projections.

- More ambitious removal measures must be implemented to breach the gap. Measures with additional mitigation potential include increased afforestation, decreased deforestation and improved forest management — such as reduction in the annual average of forest area affected by wildfires and biotic damage — fallowing of histosols, rewetting of peatlands, improved crop rotation and improved grassland management. However, for many of the measures, there is a time lag between implementation of a mitigation measure and visibility of its impact.

For more references and additional information, including at country level, see the full indicator version.

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8TH EAP THEMATIC PRIORITY OBJECTIVE

Climate change adaptation

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2 Climate change adaptation

Enhancing the capacity to adapt, strengthening resilience and reducing vulnerability to climate change

Climate change is happening already — the summer of 2023 was globally the warmest summer on record and the fifth hottest in Europe ([1]). Beyond deploying measures to cut greenhouse gas (GHG) emissions and slow the pace of global warming, there is also a need for proactive preparation and adjustment to the effects of climate change such as sea level rise, water scarcity, more frequent and more severe floods, heatwaves and storms. The 8th Environment Action Programme (EAP) ([2]), in line with the Paris Agreement ([3]) and the EU Climate Law ([4]), requires continuous progress in enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change. The EU adaptation strategy ([5]) aligns with these policies and aims to build resilience and ensure that the EU is well-prepared to manage the risks and adapt to the impacts of climate change.

The European Commission's 8th EAP monitoring framework ([6]) includes two indicators and corresponding targets for 2030 to capture aspects of progress on climate change adaptation:

- An indicator on economic losses from weather- and climate-related extremes in the EU to monitor progress on achieving the target of reducing overall monetary losses from weather- and climate-related events.
- An indicator on drought impact on ecosystems to monitor whether the EU area affected by drought and loss of vegetation productivity will decrease.

The indicator assessment results are summarised further below. Overall, it is unlikely but uncertain that the ambition levels set for 2030 in relation to these two indicators will be met. Past trends in both cases show a deterioration of the situation. In addition, the Intergovernmental Panel on Climate Change ([7]) predicts that many climate-related extreme events, such as droughts, will become more frequent and severe around the world. It would be important to put in place comprehensive, integrated approaches to mitigate future impacts and to increase resilience against climate change.

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

Will the objective be met by 2030?		
	It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
	It is likely but uncertain	i.e. it answers 'maybe yes' to the question
	It is unlikely but uncertain	i.e. it answers 'maybe no'
	It is very unlikely	i.e. it answers 'no' with a high degree confidence
?	**It is unclear**	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Economic losses from climate- and weather-related extremes:

Will monetary losses from weather- and climate-related events fall in the coming years?

Unlikely but uncertain. Weather- and climate-related extreme events are projected to intensify further, though a full implementation of climate change adaptation strategies can limit the costs.

Figure 2.1 **Economic losses caused by weather- and climate - related extreme events, EU**

Source: Risklayer/EEA.

Relevance and policy target

- Weather- and climate-related hazards, such as extreme temperature, heavy precipitation and droughts, pose risks to human health and the environment, and can lead to substantial economic losses.

- The EU Adaptation Strategy aims to build resilience and ensure the EU is well-prepared to manage these risks, and can adapt to the impacts of climate change. The EU aims, among other things, to ultimately reduce overall monetary losses from weather- and climate-related events.

Indicator past trend (2009-2022, 30-year moving average, in 2022 prices): increase ↑
Latest value (2022): EUR 52.3 billion

- Between 1980 and 2022, the cost of weather- and climate-related extremes amounted to EUR 650 billion (2022 values), of which EUR 52.3 billion was in 2022. Hydrological events (floods) account for more than 40%, meteorological events (storms including lightning and hail, plus mass movements) for almost 30% and climatological events (mostly heatwaves but also droughts, forest fires and cold waves) for almost 30% of total losses.

- There is high variability from year to year in the economic losses, making it difficult to analyse trends. However, some statistical analysis (a 30-year moving average) shows that losses have increased over time.

2030 outlook

- It is uncertain but unlikely that the economic losses associated with extreme weather and climate events will fall by 2030.

- The Intergovernmental Panel on Climate Change ([8]) predicts that weather- and climate-related extreme events will become more frequent and severe around the world because of climate change. This could affect multiple sectors and cause systemic failures across Europe, leading to greater economic losses.

- The future cost of weather- and climate-related hazards depends not only on the frequency and severity of events but also on several other factors, such as the value and resilience of the assets ([9])([10]) and the envisaged climate adaptation measures ([11])([12]).

- If fully implemented, the EU and the national adaptation strategies will contribute to limiting the economic costs of weather- and climate-related events. To do so, adaptation plans should ideally include a balanced set of measures, covering governance and institutional, economic and financial, physical and technological aspects, as well as nature-based solutions, knowledge and behavioural change ([13]).

For more references and additional information, including at country level, see the full indicator version.

Drought impact on ecosystems:

Will the area impacted by drought decrease in the coming years?

Unlikely but uncertain. The magnitude of drought events is projected to increase and it is uncertain whether climate change adaptation strategies will be effectively implemented.

Figure 2.2 **Area of drought impact on vegetation productivity, EU**

Source: EEA/Copernicus Land Monitoring Service and Copernicus Emergency Service.

Relevance and policy target

- Droughts hamper nature's ability to deliver a wide range of environmental, economic, social and biodiversity benefits. Droughts also impact the EU's ability to achieve its climate change mitigation ([14])([15]) and adaptation ([16]) aims. It is therefore important that the EU take action to decrease impact severity and strengthen ecosystem resilience against climate change-related droughts.

Indicator past trend (2000-2022): increase ↑
Latest value (2022): 631,000 square kilometres

- In 2022, the EU experienced its hottest summer and second warmest year on record, and with it the largest overall drought impacted area: 631,000km^2. During the period 2000-2022, on average 4.2% (ca. 167,000km^2) of EU land was affected annually by droughts due to low precipitation, high evaporation and heatwaves fuelled by climate change.

- The largest two affected areas were croplands, contributing to crop failures, and forests, which sequester large amounts of carbon and provide important habitats for wildlife. Grasslands and wetlands also showed significant increases in the impacted area. They are among the most biodiverse areas in the EU and have high carbon storage potential.

2030 outlook

- It is unlikely but uncertain that drought-affected areas will decrease by 2030.

- The extent of drought-affected areas increased over the examined period.

- Due to climate change, the frequency and intensity of heatwaves is projected to increase ([17]), whereas in the continental and Mediterranean regions, summer precipitation is projected to decrease ([18]).

- This means that drought-affected areas may not decrease by 2030 if EU and national wide adaptation strategies such as land management practices are not put in place in a timely manner to mitigate future impacts of droughts.

For more references and additional information, including at country level, see the full indicator version.

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8TH EAP THEMATIC PRIORITY OBJECTIVE

A regenerative circular economy

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3 A regenerative circular economy

A wellbeing economy that gives back to the planet more than it takes and accelerates the transition to a circular economy

A sustainable economy is a prerequisite to an economy of wellbeing. The EU adopted the circular economy action plan (1) in 2020 and aims to ensure that the resources it uses remain in the EU economy for as long as possible and that waste is prevented. Building on this, the 8th Environment Action Programme (EAP) (2) aims for a regenerative circular economy that gives back to the planet more than it takes.

In order to capture progress towards a regenerative circular economy, the European Commission 8th EAP monitoring framework (3) includes two indicators and corresponding targets for 2030:

- An indicator on raw material consumption to monitor whether the EU will significantly decrease its per capita material footprint.
- An indicator on total waste generation to monitor waste prevention efforts to significantly reduce per capita EU waste generation by 2030.

The indicator assessment results are summarised further below. In short, it seems that at present the EU may not meet the targets for these two indicators by 2030. Economic growth has so far been a key driver behind the trends in both cases. Legislation already in place to prevent waste generation and better manage waste, including recycling and re-using materials, has contributed to a limited decoupling of raw material consumption and waste generation from economic growth. Therefore, significant additional efforts to reduce consumption of natural resources and move further towards a circular economy would be needed to reach the 2030 targets.

The methodology used for determining the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

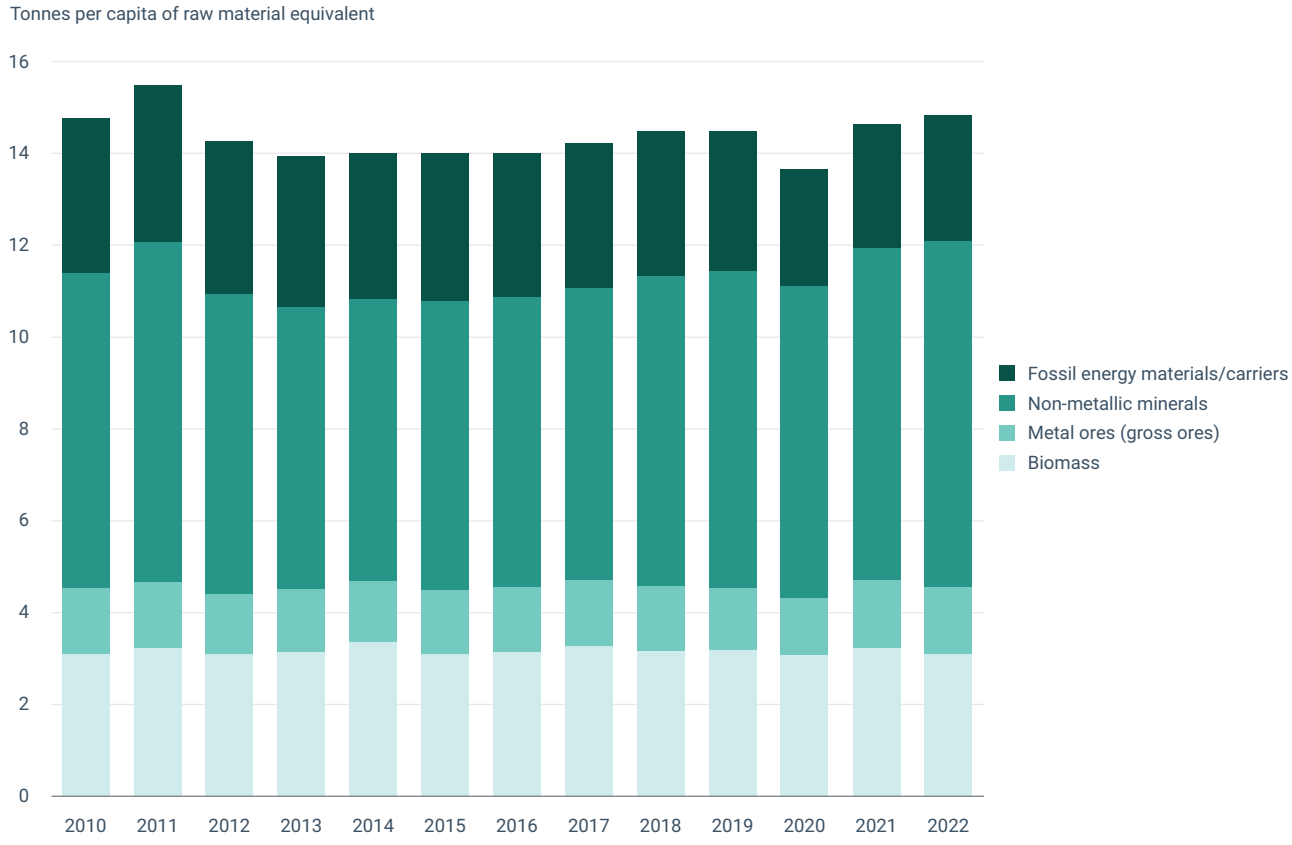
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Raw material consumption (also known as material footprint):

Will those who live in the EU significantly decrease their material footprint in the coming years?

Unlikely but uncertain. No real decrease has happened so far and some projections show increases in future demand for materials in the EU.

Figure 3.1 **Material Footprint, EU**



Source: Eurostat.

Relevance and policy target

- The material footprint shows the amount of extraction, both inside and outside the EU, of raw material needed to produce the goods and services that EU residents consume.

- The 8th EAP aims to significantly decrease the EU's material footprint in order to safeguard precious natural resources and reduce the significant environmental and climate impacts from extraction and processing of these resources, such as biodiversity loss and climate change.

Indicator past trend (2010-2022): stable →
Latest value (2022, preliminary): 14.8 tonnes of raw material equivalent per capita

- Since 2010, the EU's material footprint has remained relatively stable. Preliminary estimates show that in 2022 it was 14.8 tonnes per capita. The extraction of non-metallic minerals (e.g. gravel and sand) mainly serves the construction sector. It accounts for about half of the material footprint and is largely responsible for the overall trend in the period 2010-2022.

- The EU's current material footprint is higher than the global average and exceeds the planet's 'safe operating space' for resource extraction. In other words, if the world were to consume resources at the level of the EU, it would exceed the capacity of the planet to provide these resources ([4]).

2030 outlook

- It is unlikely but uncertain that the EU's material footprint will significantly decrease in the coming decade.

- There has been no progress in reducing the material consumption footprint over the years, while projections by the Organisation for Economic Cooperation and Development show an increase in future demand for materials in the EU ([5]). However, the results predate the policies the EU has recently adopted that aim to temper demand for primary material extraction and encourage longer lifetimes of products.

- Moving towards a circular economy could decouple economic activity from raw material consumption by substituting raw materials with recovered materials. Overall, significant efforts are needed to reduce consumption and material extraction, and a switch to goods and services that require less material.

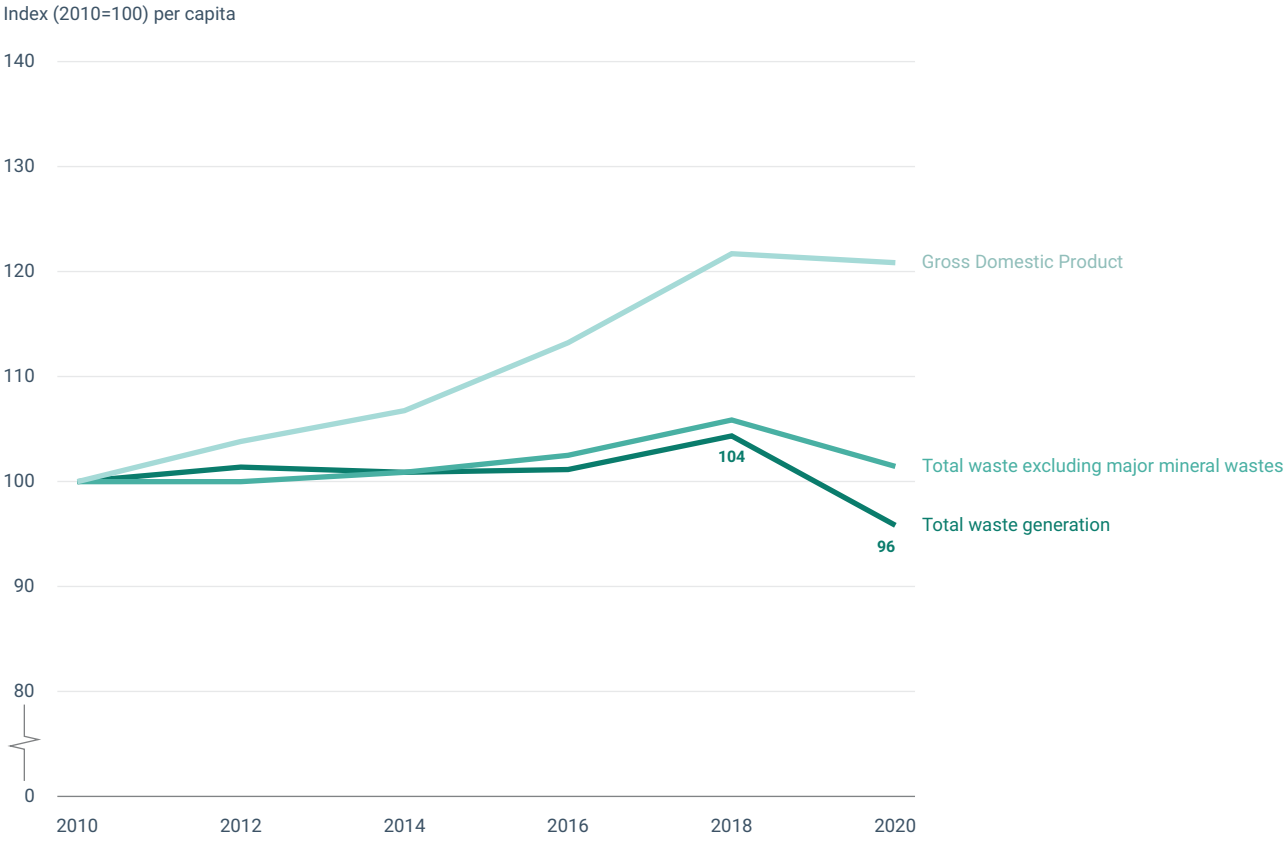
For more references and additional information, including at country level, see the full indicator version.

Total waste generation:

Will those who live in the EU significantly reduce the total amount of waste they generate by 2030?

Unlikely but uncertain. Historically, waste generation has closely followed economic growth trends, and economic growth is expected to be positive in the coming years. Policies in place can nevertheless limit the effect of economic growth on waste generation.

Figure 3.2 **Waste generation and decoupling, EU**



Source: Eurostat.

Relevance and policy target

- Reducing the generation of waste safeguards material and energy resources and reduces the environmental impacts associated with producing products and managing waste.
- The circular economy action plan aims to significantly reduce total waste in the EU by 2030.

Indicator past trend (2010-2020): increase (2010-2018) ↑, decrease (2018-2020) ↓
Latest value (2020): 4.8 tonnes per capita

- Between 2010 and 2020, per capita total waste generation decreased by 4.2% in the EU to 4.8 tonnes per capita in 2020. This decline was exclusively due to a decrease in waste generation in 2018-2020, reflecting the COVID-19 pandemic and the ensuing economic slowdown.
- The trend over the 2010-2020 period was driven by trends in mining and quarrying, and construction which together constitute the largest part of total waste generation (64% in 2020). Waste generated by households, and water and waste treatment activities, increased over the 2010-2020 period.

2030 outlook

- It is unlikely but uncertain that per capita total waste generation will significantly decrease by 2030.
- Economic growth has been a key driver of waste generation trends ([6]) and EU GDP growth rates are projected to remain positive in the coming years ([7]). Waste prevention and management policies currently in place could limit the causal relationship between GDP growth and waste generation ([8]).
- Substantial additional effort in implementing circular economy measures, including waste prevention, would be required to sustain the decrease in waste generation.

For more references and additional information, including at country level, see the full indicator version.

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8TH EAP THEMATIC PRIORITY OBJECTIVE

Zero pollution and a toxic-free environment

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4 Zero pollution and a toxic-free environment

Pursuing zero pollution to achieve a toxic-free environment

EU citizens are already benefiting from years of successful environmental policies that have contained or reduced the emissions of key pollutants to the air, water and soil. However, pollution still harms human health and the environment. The 8th Environment Action Programme (EAP) ([1]) pursues a zero pollution goal to achieve a toxic-free environment by 2030. The European Commission's zero pollution action plan ([2]), a key deliverable of the European Green Deal ([3]), underpins the implementation of the 8th EAP and includes actions to reduce pollution by 2030 and, by 2050, achieve levels that are no longer harmful to human health and natural ecosystems.

To capture progress on efforts to reduce pollution, the European Commission's 8th EAP monitoring framework ([4]) includes two indicators and corresponding 2030 targets:

- An indicator on premature deaths attributed to exposure to fine particulate matter to monitor whether the EU will reduce such deaths by at least 55% compared to 2005 levels by 2030.
- An indicator on nitrates in groundwater to monitor whether the EU will reduce by at least 50% nutrient losses into safe groundwater resources by 2030.

The indicator assessment results are summarised further below. With the implementation of existing legislation and new legislation taking effect, a reduction in premature deaths attributed to fine particulate matter is expected to be sufficient to meet the 2030 target. For groundwater quality, it is uncertain but unlikely that nutrient losses to groundwater could be reduced by 50% by 2030, due to lack of progress so far despite legislation that has been in place for several decades. Most of these losses result from excessive fertiliser use. Some progress is expected by 2030 thanks to extra initiatives under the European Green Deal.

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

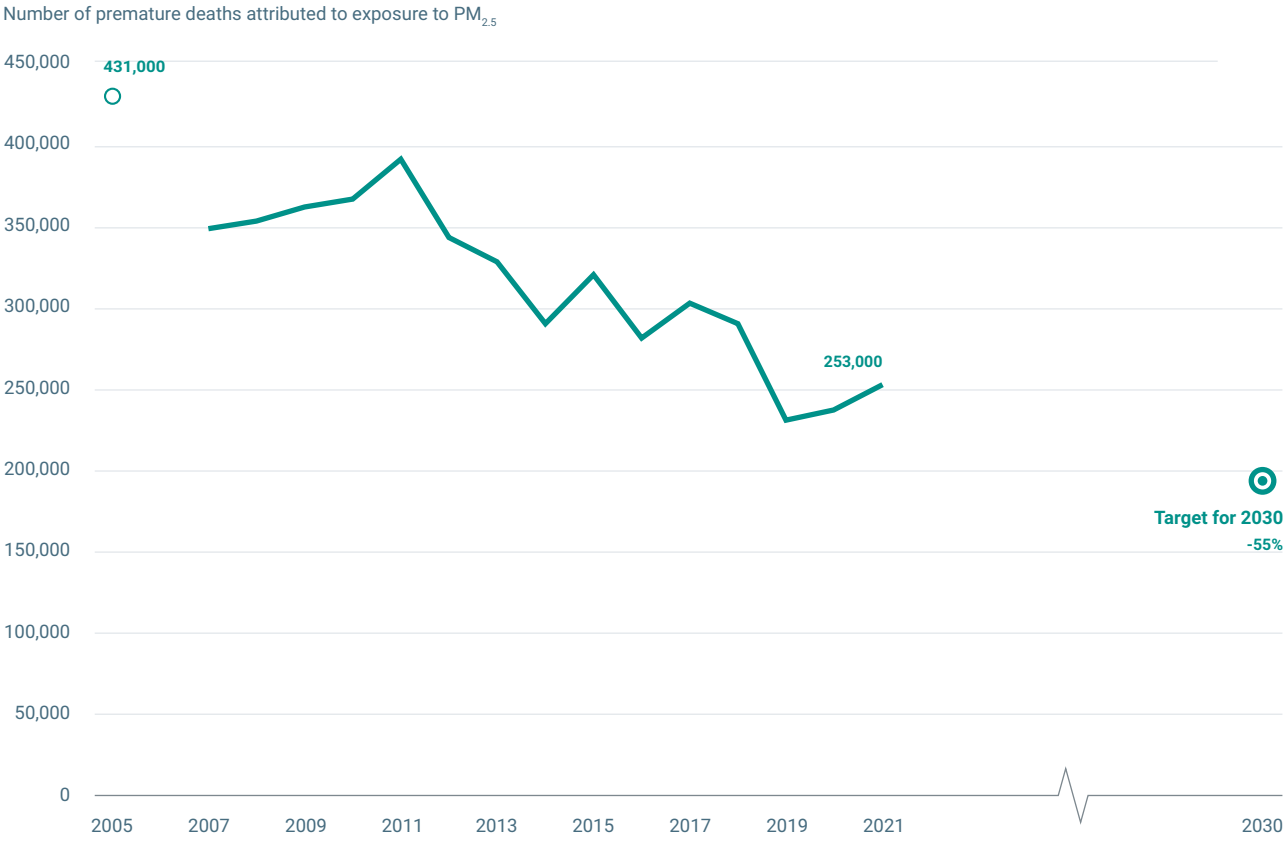
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Premature deaths due to air pollution (exposure to fine particulate matter):

Will they be reduced by 55% from 2005 levels by 2030?

Very likely. The target will be overreached and reach 68% if the trend of the past 10 years continues to 2030.

Figure 4.1 **Premature deaths attributable to exposure to fine particulate matter, EU**



Source: EEA.

Relevance and policy target

- Air pollution is a major cause of mortality and disease in Europe and is the largest environmental health risk ([5]). The air pollutant deemed to cause the most severe impacts on human health is fine particulate matter ($PM_{2.5}$) ([6]).

- The European Commission's zero pollution action plan sets a target of reducing the health impacts of air pollution (estimated by the number of premature deaths attributable to $PM_{2.5}$) by at least 55% by 2030, compared to the 2005 level.

Indicator past trend (2005-2021): decrease ↓
Latest value (2021): 253,000 premature deaths attributable to exposure to fine particulate matter

- Between 2005 and 2021, the number of premature deaths in the EU attributable to exposure to $PM_{2.5}$ fell by 41%. Despite ongoing improvement, there were 253,000 such deaths in the EU in 2021.

- The decline in premature mortality was the result of implementing EU and derived national and local policies to improve air quality and to reduce emissions of air pollutants. These policies succeeded in reducing $PM_{2.5}$ emissions from domestic heating, their main source, as well as from other sources such as transport, industry and agriculture ([7]).

2030 outlook

- It is very likely that the 2030 55% zero pollution action plan reduction target will be met.

- The target will be exceeded and will reach 68% if the trend of the past 10 years continues to 2030.

- The Zero pollution outlook 2022, published by the European Commission Joint Research Centre, expects that the target will be overreached if the foreseen clean air measures, with the climate and energy polices of the Fit for 55 package ([8]), are implemented. The outlook predicts a reduction of 66% by 2030 if these conditions are met ([9]).

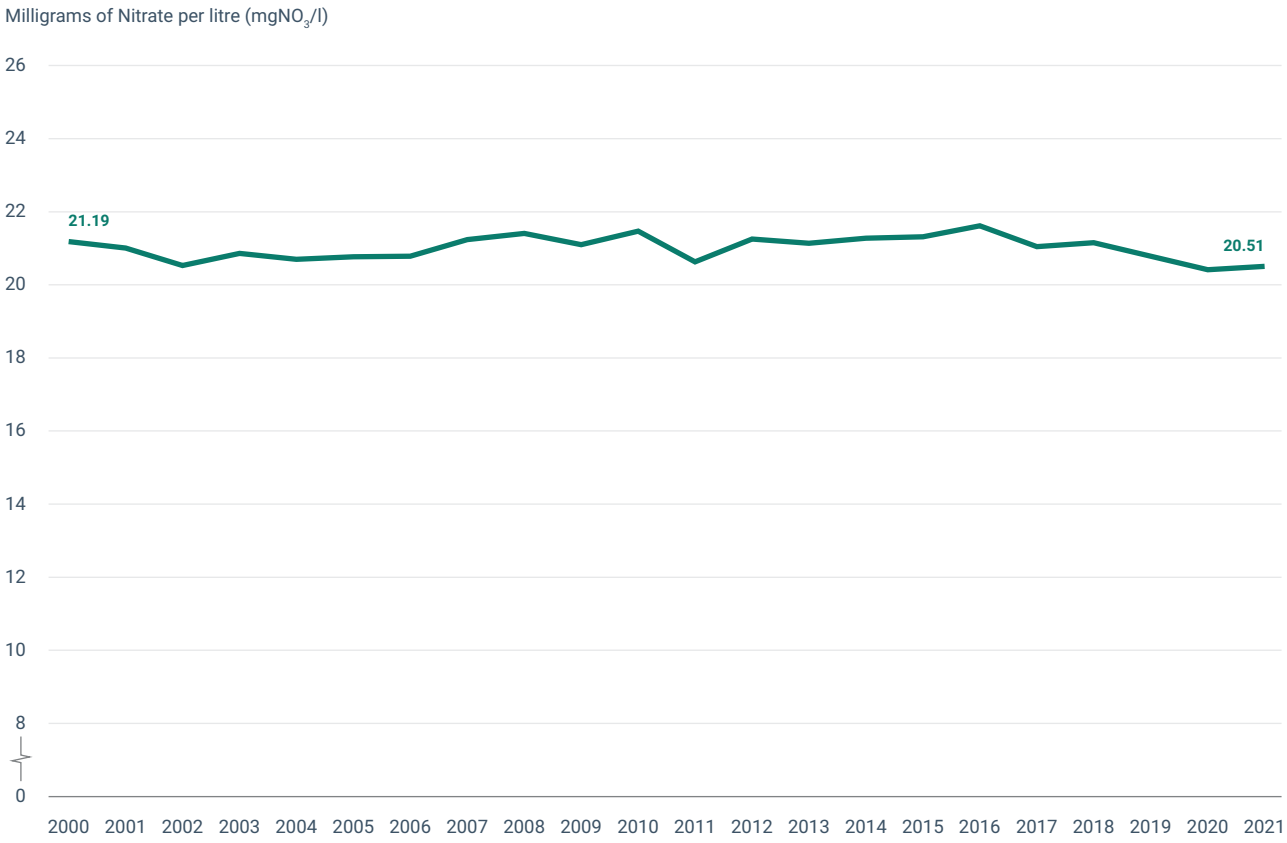
For more references and additional information, including at country level, see the full indicator version.

Nitrates in groundwater:

Will nutrient losses into safe groundwater resources decrease by at least 50% by 2030?

Unlikely but uncertain. There has not been significant change so far in the average nitrate concentrations in groundwater despite legislation in place. However, some improvement is expected by 2030.

Figure 4.2 **Nitrates in groundwater, EU**



Source: EEA.

Relevance and policy target

- Nutrients such as nitrogen not absorbed by plants are lost to the environment. When present in excessive amounts, they become pollutants. This includes high levels of nitrate (NO_3) in groundwater, which poses a threat to the environment and to human health ([10])([11]).

- The European Green Deal, with its initiatives of the zero pollution action plan and the biodiversity ([12]) and farm to fork ([13]) strategies, set a goal for the EU to reduce nutrient losses to the environment (air, water and soil) by 50% by 2030.

- Several directives address nitrogen losses to the environment. The drinking water ([14]) and groundwater ([15]) directives set the maximum allowable concentration for nitrate at 50mg NO_3/l to protect human health and drinking water resources.

Indicator past trend (2000-2021): stable →
Latest value (2021): 20.5 milligrams of average nitrate concentration per litre of groundwater

- Despite legislation in place addressing nutrient pollution, average NO_3 concentration in EU groundwater did not change significantly from 2000 to 2021, remaining at approximately 21mg NO_3/l. In the most recent analysis of groundwater concentrations reported under the nitrates directive ([16]) covering the period 2016-2019, 14.1% of groundwater stations exceeded the maximum allowable concentration of 50mg NO_3/l which is very similar to the 13.1% observed in the previous reporting period of 2012-2015 ([17]).

- Mineral fertilisers and manure are the main sources of nitrate concentrations in EU groundwater. An estimated 80% of the nitrogen discharge to the EU aquatic environment comes from agriculture ([18])([19]).

2030 outlook

- It remains unlikely but uncertain that nutrient losses to groundwater will decrease by 50% by 2030 across the EU. However, in recognition of the seriousness of the problem, the broad portfolio of measures under the European Green Deal and its Farm to Fork and Biodiversity strategies, zero pollution ambition and the European Climate Law ([20]), in combination with the new common agricultural policy (CAP, 2023-2027) ([21]), should lead to improvements.

- A recent analysis by the European Commission Joint Research Centre modelled a future impact of improvements in domestic wastewater treatment, reduction of nutrient emissions to air and measures under the CAP 2023-2027 needed to achieve the Biodiversity Strategy and Farm to Fork targets. In combination, these measures could reduce the nutrient load in European seas by about 30% for nitrogen and 20% for phosphorous, where the CAP measures are particularly relevant for groundwater. While these projected reductions are substantial, they are only an element of the target of 50% reduction in nutrient losses and on their own will not result in reaching the target ([22]).

For more references and additional information, including at country level, see the full indicator version.

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8TH EAP THEMATIC PRIORITY OBJECTIVE

Biodiversity and ecosystems

5 Biodiversity and ecosystems

Protecting and restoring terrestrial and marine biodiversity and ecosystems

Society and the economy depend on a healthy biodiversity. The EU biodiversity strategy for 2030 ([1]), launched in 2020, aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet. The 8th Environment Action Programme (EAP) ([2]) builds on the Biodiversity Strategy and aims to protect, preserve and restore Europe's biodiversity by 2030 and beyond.

To capture progress towards key objectives of biodiversity conservation and restoration, the European Commission's 8th EAP monitoring framework ([3]) selected four indicators and corresponding targets to be met by 2030:

- An indicator on the EU common bird index, to keep track of whether the decline of the population of common birds will reverse by 2030.
- Two indicators on designated terrestrial and marine protected areas to monitor whether overall coverage of protected areas will reach at least 30% of the EU's land and sea area by 2030.
- An indicator on EU forest connectivity to monitor whether the degree of forest connectivity will increase, with a view to creating and integrating ecological corridors and increasing climate change resilience.

The indicator assessment results are summarised further below. In summary, it seems unlikely that any of the four biodiversity and ecosystem-related monitoring targets selected for this priority objective will be reached by 2030. A common reason for this across the indicators is the high pressure on land and sea use from socio-economic sectors such as agriculture, fisheries and urbanisation. If the 2030 targets are to be met, Member States will need to make significant additional efforts to improve implementation, introduce new measures to restore biodiversity and further mainstream biodiversity into policies such as the common agricultural ([4]) and fisheries ([5]) policies. Furthermore, the time lag between implementation of measures and the final outcomes of improved biodiversity should be taken into account. The dashboard that tracks progress under the EU biodiversity strategy for 2030 points to a similar set of conclusions ([6]).

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

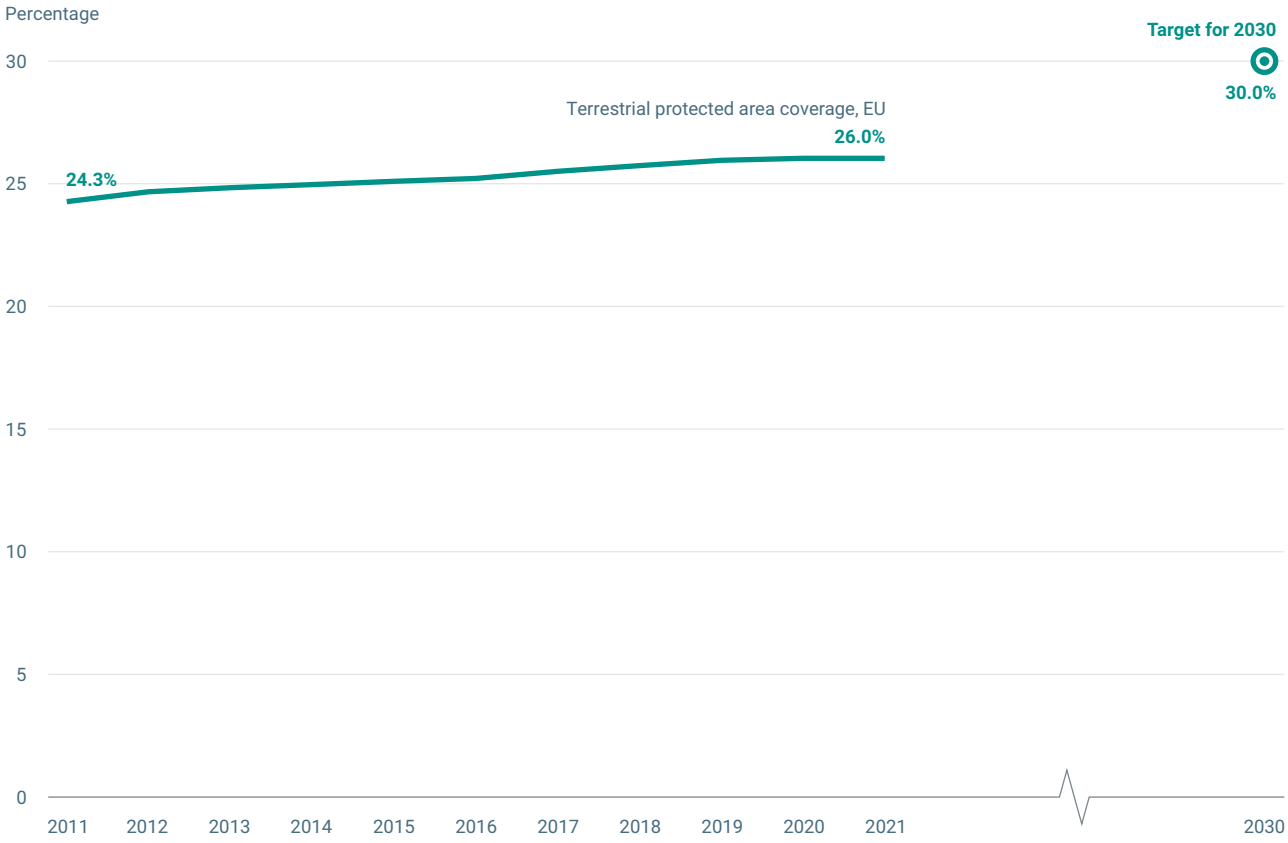
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Designated terrestrial protected areas:

Will at least 30% of the EU's land be legally designated as terrestrial protected areas by 2030?

Unlikely but uncertain. The pace of progress has been slow over the past 10 years and will have to more than double to reach the 2030 target. Pledges for additional designations submitted by Member States in 2023 will determine the prospects of achieving the target.

Figure 5.1 **Terrestrial protected area coverage, EU**



Source: EEA/EuroGeographics.

Relevance and policy target

- Terrestrial protected areas benefit species, ecosystems and the environment overall, and contribute to human health and wellbeing. Protected areas provide economic and employment opportunities and have significant cultural value.
- The EU biodiversity strategy for 2030 sets the target of legally protecting and effectively managing a minimum of 30% of EU land.

Indicator past trend (2011-2021): increase ↑
Latest value (2021): 26%

- Over the 2011-2021 period, protected EU land increased from 24.3% to 26%. This was mainly driven by designations to fulfil the Natura 2000 network requirements — a network of protected areas designated under the EU birds ([7]) and habitats ([8]) directives — and to a lesser extent by complementary national designations ([9]).
- Overall slow progress reflects the high pressure on land use from agriculture, transport, urban development, and increasing competition for land for producing renewable energy and biofuels.

2030 outlook

- It is unlikely but uncertain that the 2030 target will be met.
- The annual expansion rate will need to more than double compared to that of the past 10 years if the target is to be met by 2030. Member States are in the process of submitting pledges to designate new protected areas ([10]) during 2023. These pledges will provide new insights into the prospects of achieving the 2030 target.
- The designation of protected areas is not in itself a guarantee of biodiversity protection. It will be important to manage the sites effectively and in a way that ensures spatial and functional connectivity between them.

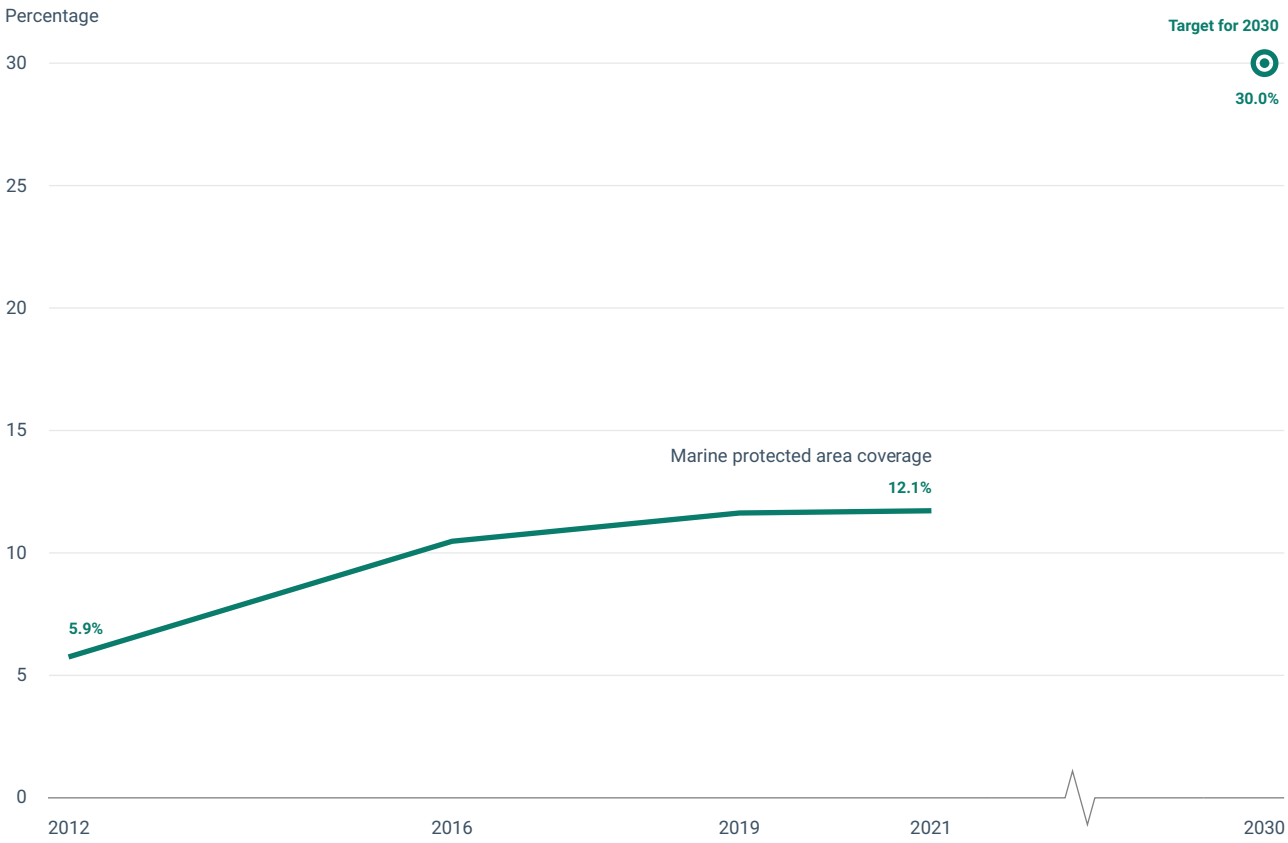
For more references and additional information, including at country level, see the full indicator version.

Designated marine protected areas:

Will at least 30% of the EU's sea areas be legally designated as marine protected areas by 2030?

Unlikely but uncertain. Despite fast progress over the years, the pace will have to increase by almost 30% to reach the 2030 target. Pledges for additional designations submitted by Member States in 2023 will determine the prospects of achieving the target.

Figure 5.2 **Marine protected area coverage, EU**



Source: EEA/HELCOM Secretariat/OSPAR Commission.

Relevance and policy target

- Marine protected areas (MPAs) play a key role in maintaining biodiversity and conserving coastal and marine ecosystems. They also provide significant economic and societal benefits and support local livelihoods.
- The EU biodiversity strategy for 2030 set the target that, by 2030, at least 30% of the EU sea area should be legally protected and well managed.

Indicator past trend (2012-2021): increase ↑
Latest value (2021): 12.1%

- Over the last decade, the total area covered by MPAs in the EU has increased substantially — from 5.9% in 2012 to 12.1% in 2021. This increase is mainly due to the expansion of the Natura 2000 network — a network of protected areas designated under the EU birds and habitats directives — while complementary national designations have also contributed ([11]).

2030 outlook

- It is unlikely but uncertain that the 2030 target will be met.
- The starting point is low and the annual rate of increase will need to increase by almost 30% compared to that observed over the past nine years in order to meet the target. The ongoing submissions of Member State pledges in 2023 for additional protected areas will provide further insights into the prospects of reaching the 2030 target ([12]).
- Designation of new MPAs alone will not guarantee conservation of the EU's marine ecosystems. It will be equally important to define these areas based on sound scientific analysis, ensuring ecological representativity, coherence and connectivity and that all MPAs are well managed.

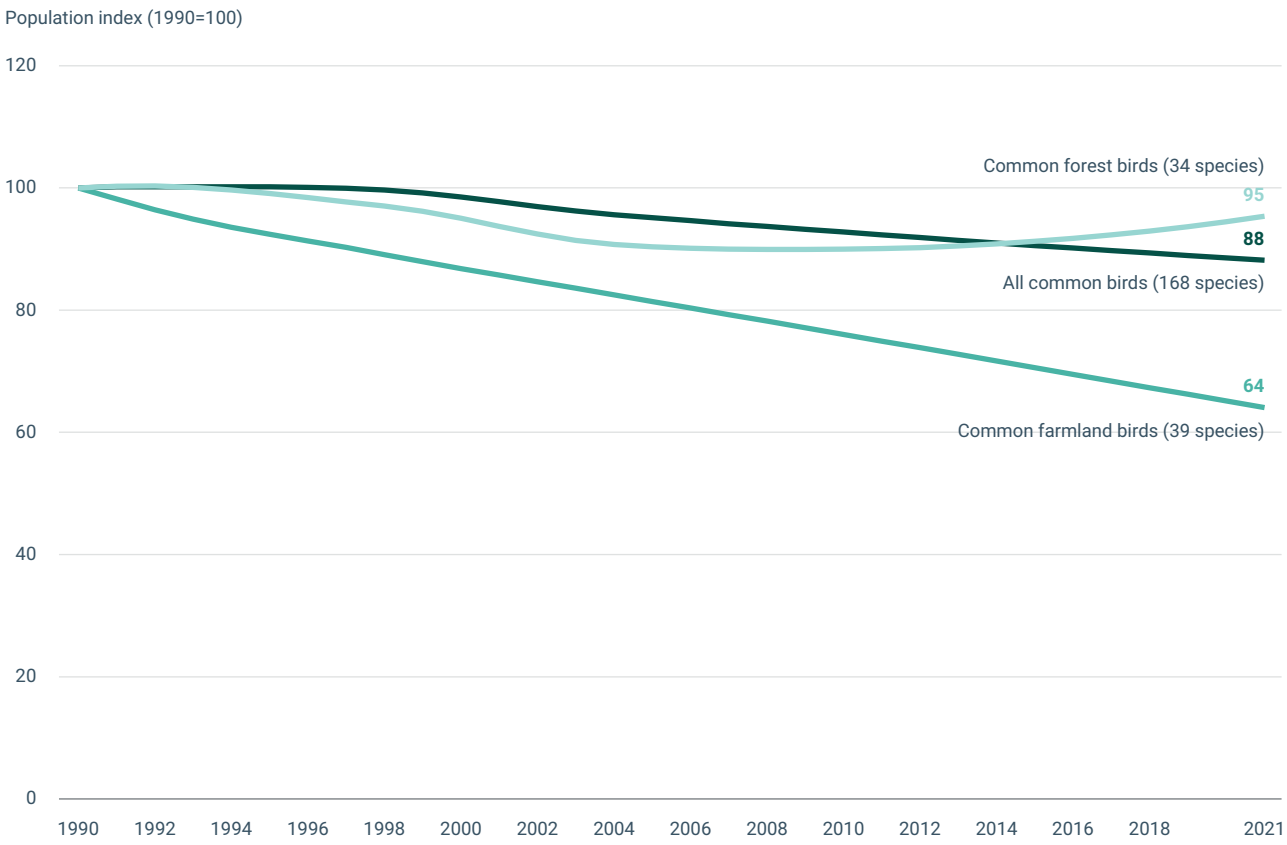
For more references and additional information, including at country level, see the full indicator version.

Common birds:

Will the decline in the population of common birds reverse by 2030?

Unlikely but uncertain. There has been a steady decline and there is uncertainty over the timing and effect of upcoming EU restoration measures.

Figure 5.3 **Common bird index, EU**



Source: European Bird Census Council/EEA.

Relevance and policy target

- Common birds are sensitive to environmental pressures. Their population numbers can reflect changes in ecosystems and other animal and plant populations, making them good indicators of biodiversity and environment health.
- The EU biodiversity strategy for 2030 aims to put biodiversity on the path to recovery by 2030.

Indicator past trend (1990-2021): decrease ↓
Latest value (2021): 88 (1990=100)

- The common birds index shows a 12% decline in the 1990-2021 period. The decline in common farmland birds over the same period was much more pronounced at 36%, while the common forest bird index decreased by 5%.
- The decline is mainly caused by intensive agricultural management and land-use change ([13]). Other factors that have adverse effects on the recovery of common bird populations include climate change ([14]) and increasing competition for land for producing renewable energy and biofuels ([15])([16])([17]).

2030 outlook

- It is unlikely but uncertain that the decline in the population of common birds can be reversed by 2030. The decline is steady and the form and timing of restoration measures as well as when impact could be achieved remain uncertain.
- To ensure the recovery of common birds, Member States will need to strengthen the implementation of existing biodiversity conservation and restoration policies and design new ones. EU policies such as the common agricultural policy need to include more effective and ambitious measures to halt biodiversity loss ([18]).

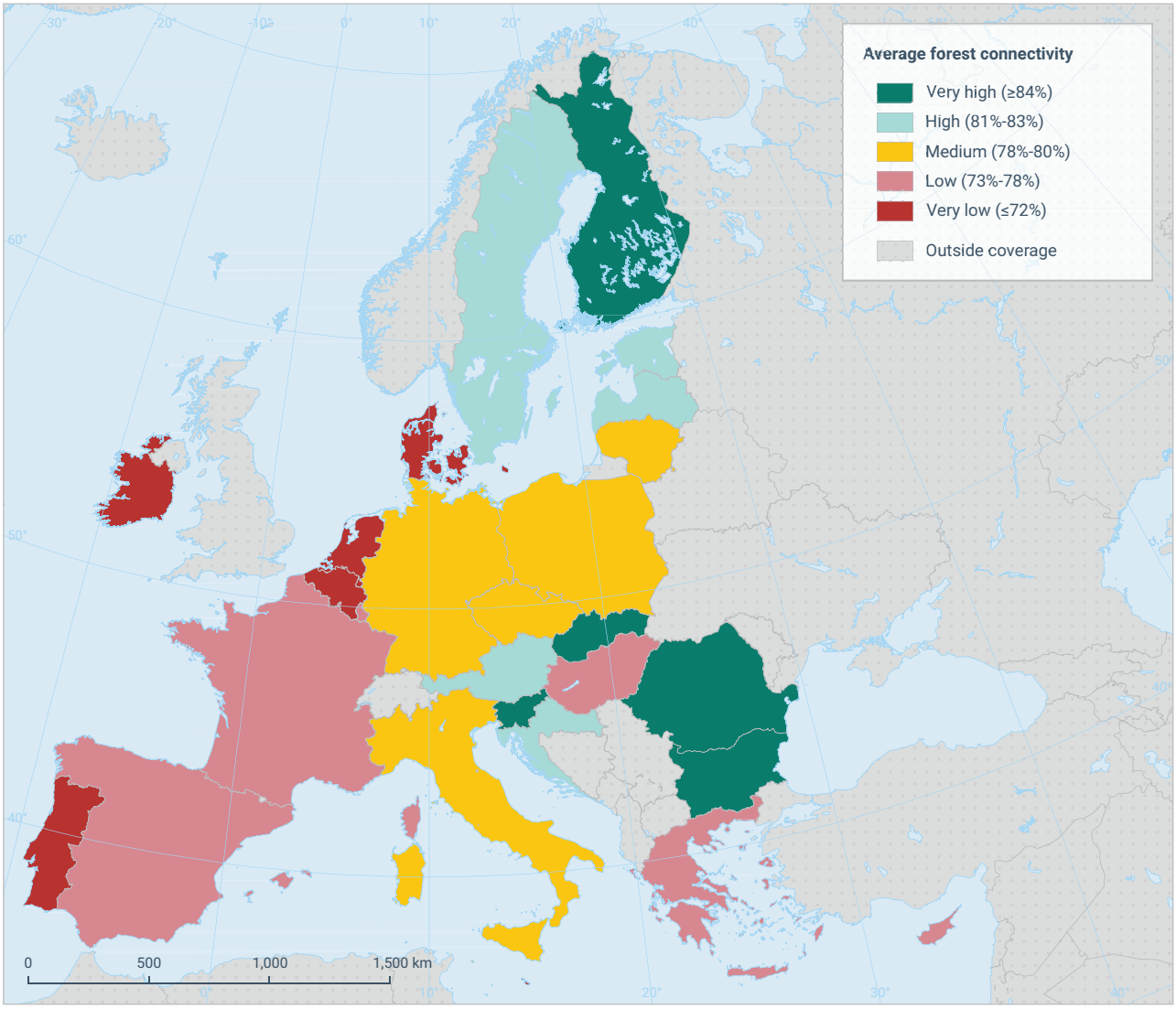
For more references and additional information see the full indicator version.

Forest connectivity:

Will the degree of connectivity in forest ecosystems increase in the coming years?

Unlikely but uncertain. The positive effects of the EU forest and biodiversity strategies on forest connectivity will take a long time to bear fruit, while actions to break forest connectivity can have immediate effects.

Map 5.1 **Forest connectivity in the EU Member States**



Reference data: © EuroGeographics, © FAO (UN), © TurkStat Source: European Commission – Eurostat/GISCO

Source: EEA, (methodology: Joint Research Centre).

Relevance and policy target

- Increasing the connectivity of forested landscapes is a key measure towards improving biodiversity and the ecological functions of forests ([19]). The EU forest strategy for 2030 ([20]) and biodiversity strategy for 2030, which include the pledge to plant at least 3 billion additional trees by 2030, promote forest connectivity ([21]).

Indicator past trend (2000-2018): stable (trend inferred by forest fragmentation data) →
Latest value on forest connectivity (2018): 79%

- In 2018, the EU average forest connectivity was 79%. The indicator is available only for that year. A methodologically correlated forest fragmentation analysis shows, nevertheless, that forest fragmentation had not changed since 2000 and from this it is concluded that forest connectivity has not improved over that period.

- Historically, forests have become fragmented because of conversion to cropland and pastures, urbanisation and infrastructure developments ([22])([23]).

2030 outlook

- It is unlikely but uncertain that forest connectivity will improve in the EU by 2030 ([24]).

- The positive effects of the EU forest and biodiversity strategies on forest connectivity, such as promoting afforestation, reforestation and restoring forest ecosystems, will most likely only become visible after 2030 because of the time lag between actions in the field and improved connectivity. On the other hand, actions to break forest connectivity, such as deforestation, can have immediate effects.

For more references and additional information, including at country level, see the full indicator version.

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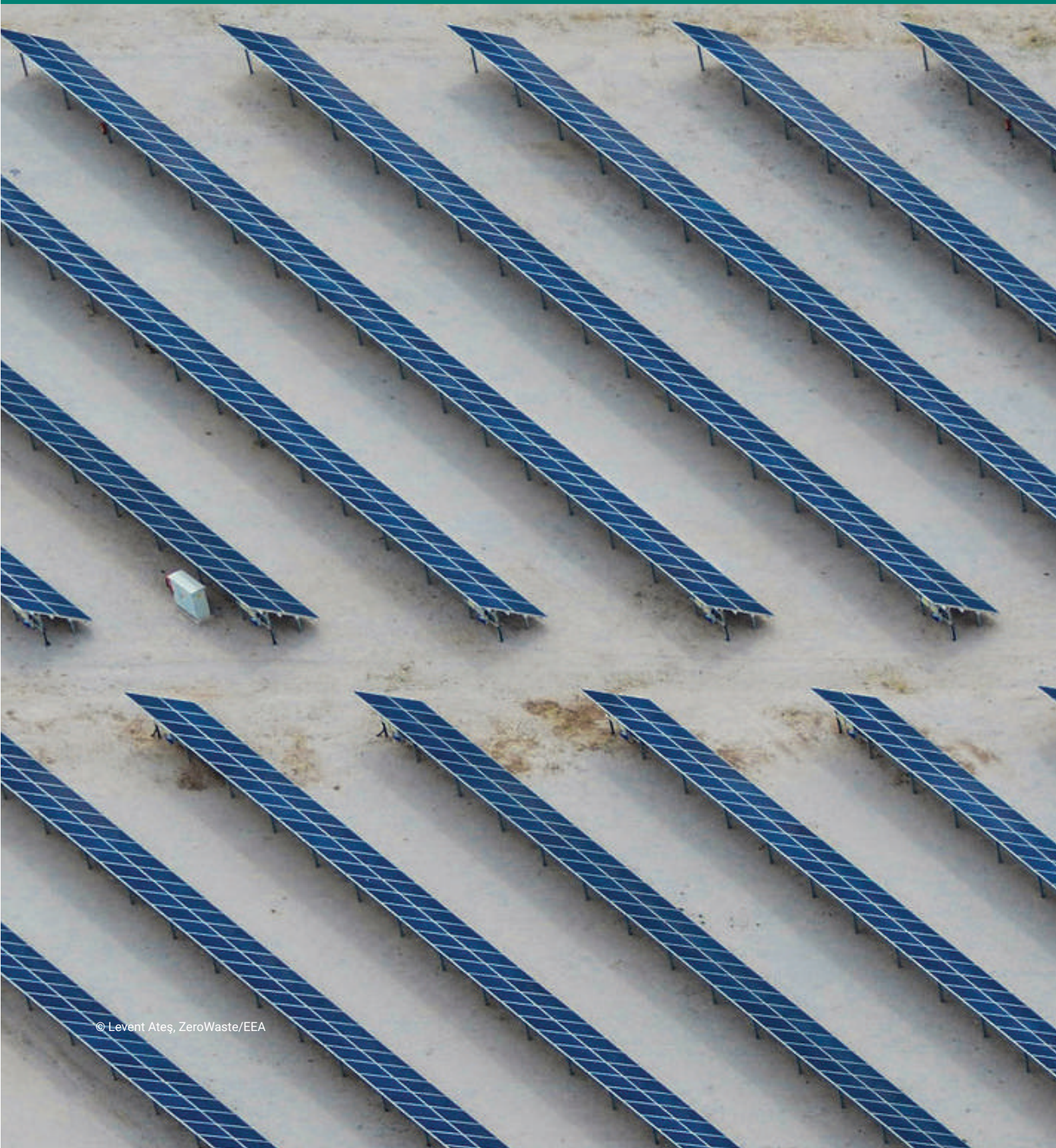
8TH EAP THEMATIC PRIORITY OBJECTIVE

Environmental and climate pressures related to EU production and consumption



6 Environmental and climate pressures related to EU production and consumption

Reducing environmental and climate change pressures, and moving towards environmental sustainability

Promoting environmental aspects of sustainability, and significantly reducing key environmental and climate pressures related to the European Union's production and consumption, is key to the success of EU's environment and climate policy. The EU's 8th Environment Action Programme (EAP) ([1]) recognised this and made it one of its priority objectives to be met by 2030.

In order to capture progress towards this objective, the European Commission's 8th EAP monitoring framework ([2]) includes five indicators and corresponding 2030 targets:

- An indicator on energy efficiency to monitor whether the EU will reduce primary and final energy consumption levels to 992.5 and 763 million tonnes respectively of oil equivalent by 2030.
- An indicator on renewable energy sources to monitor whether the EU will increase the share of renewable energy sources in gross final energy consumption to at least 42.5% by 2030.
- An indicator on circular material use rate to monitor whether the EU share of recycled material in overall material use will double by 2030 compared to 2020.
- An indicator on public transport to monitor whether there will be an increase in the share of buses and trains in inland passenger transport in the EU.
- An indicator on organic farming to monitor whether the share of the EU's agricultural land that is organically farmed increases to at least a quarter by 2030.

The indicator assessment results are summarised further below. In summary, despite observed progress, the prospects of meeting the corresponding 2030 targets are, at present, not good. A common denominator across all five indicators is the extent of the required change, the speed at which this needs to take place and the need for a deep transformation of the systems that underpin these five areas if the targets are to be met by 2030. In addition, reducing consumption, energy and material needs and enabling sustainable choices for consumption, energy use, food and mobility would be key determinants in succeeding with meeting the targets.

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

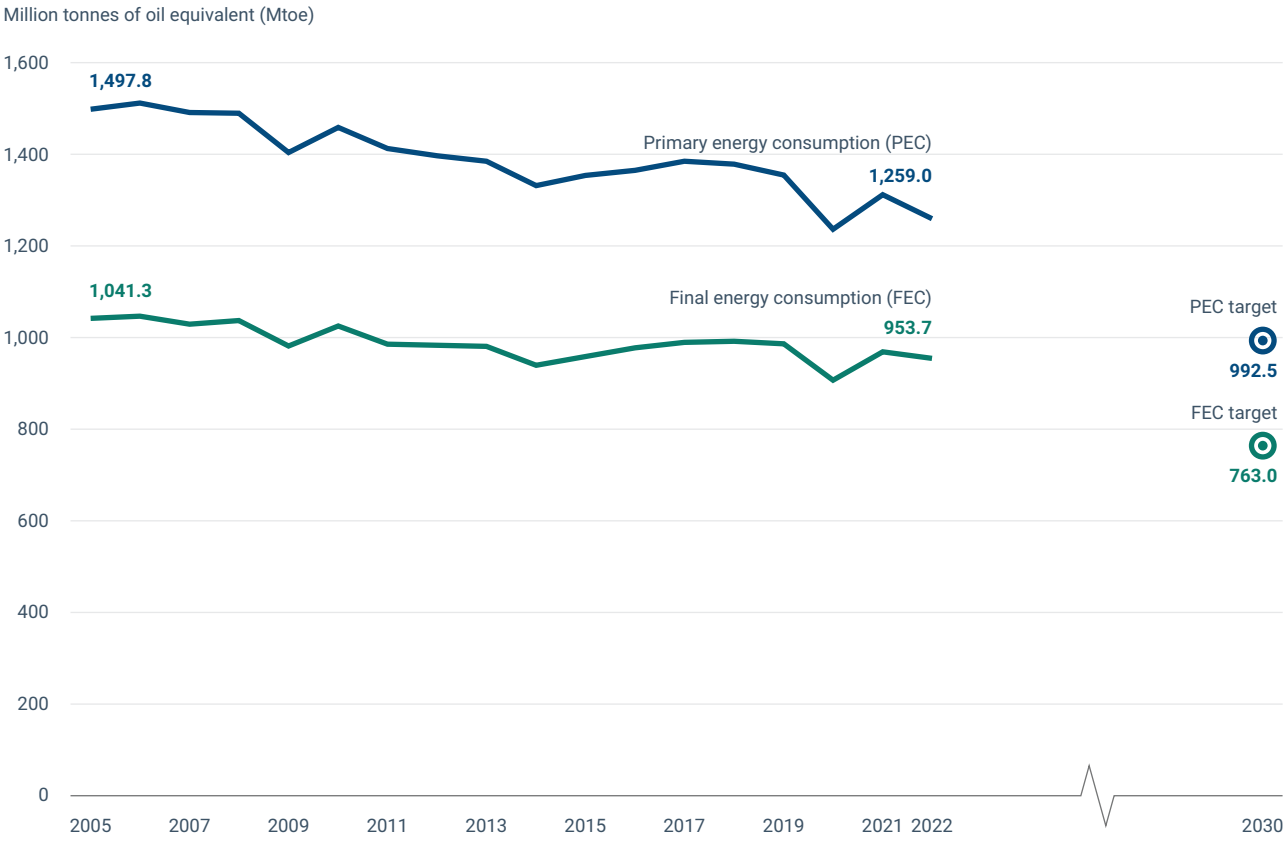
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Energy consumption:

Will primary and final energy consumption levels fall to 992.5 and 763 million tonnes of oil equivalent respectively by 2030?

Very unlikely. In the remaining years to 2030, the average annual pace of reduction seen in the past 10 years will have to be three times faster to meet the primary energy consumption target, and nine times faster to meet the legally-binding final energy consumption target.

Figure 6.1 **Primary and final energy consumption, EU**



Source: Eurostat/EEA.

Relevance and policy target

- Reducing energy consumption reduces associated costs, decreases energy dependence, and reduces the environmental and climate impacts of energy supply and use.
- The EU has a binding target to bring final energy consumption (FEC) levels down to 763 million tonnes of oil equivalent (Mtoe) by 2030 ([3]). FEC is the energy consumed by end users such as households and transport.
- The EU also aims to reduce by 2030 the levels of primary energy consumption (PEC) to no more than 992.5 Mtoe ([4]). PEC represents the total energy demand within a country, including losses through the production and distribution of the energy to end users.

Indicator past trend (2005-2022): decrease ↓
Latest value (2022, preliminary): FEC: 954 million tonnes oil equivalent (Mtoe), PEC: 1,259 Mtoe

- Over the 2005-2022 period, FEC fell by 8% and PEC by 16%.
- The ongoing substitution of fossil fuels and nuclear by the typically more efficient renewable energy in electricity generation, coupled with improvements in energy transformation processes, have contributed significantly to the reduction in PEC. Energy saving and energy efficiency measures, structural changes towards less energy-intensive industries and gradually warmer winters because of climate change were the main reasons behind the decrease of FEC.

2030 outlook

- It is very unlikely that the EU will meet the 2030 PEC and FEC targets.
- To reach the targets, energy consumption in the years up to 2030 will have to fall at a pace three times higher for PEC and nine times higher for FEC compared to that of the past 10 years. The FEC target is legally binding.
- A deep and fast transformation of the energy sector is necessary if the targets are to be met. To maximise benefits, new measures will be needed to empower users to operate in response to the system's needs. Member States will develop their policies and measures in updated National Energy and Climate Plans in 2024 and these may include pathways to address the energy efficiency shortfall.

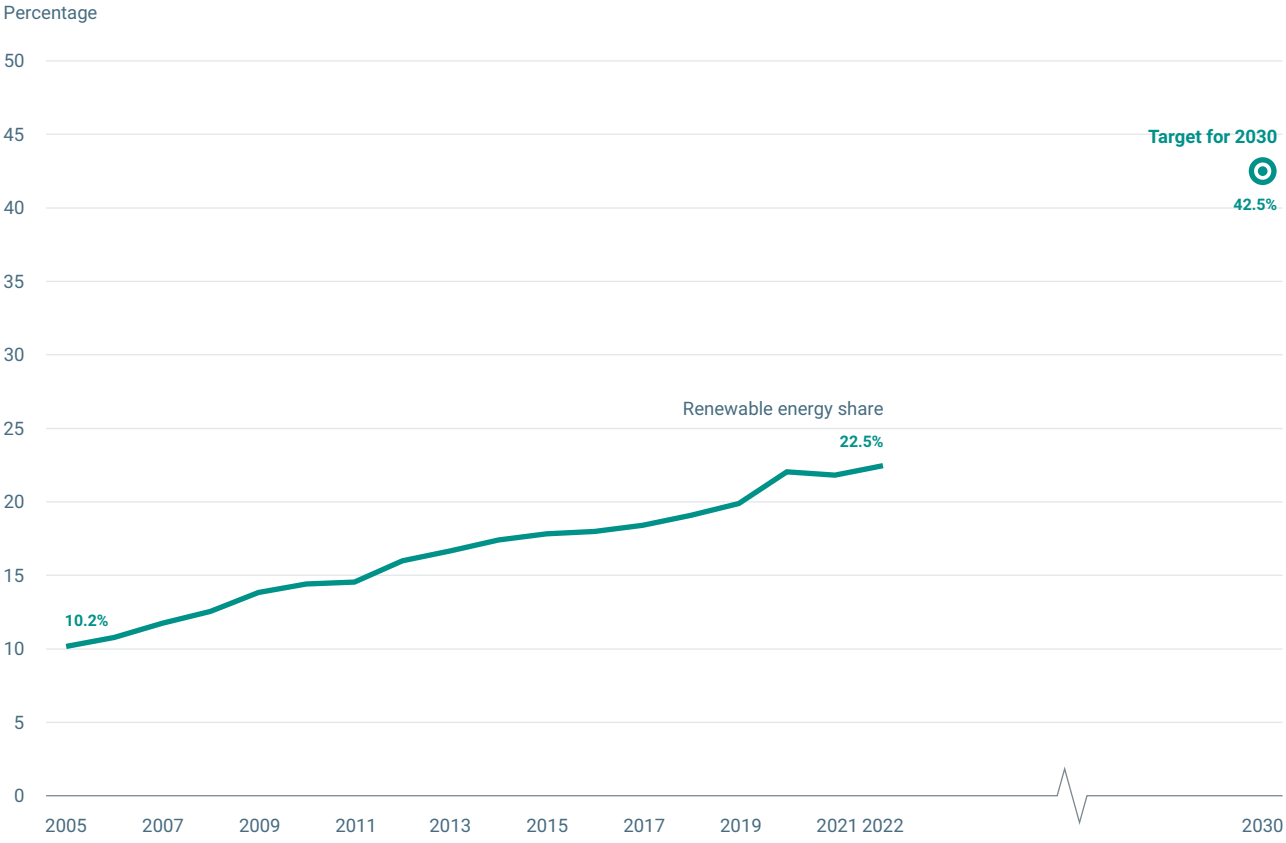
For more references and additional information, including at country level, see the full indicator version.

Renewable energies:

Will the share of renewable energy in gross final energy consumption reach at least 42.5% by 2030?

Unlikely but uncertain. Requires more than double the average annual rate of growth from now until 2030 compared to that of the past 10 years. Recent rapid deployment of some renewable energy technologies provides for some optimism in meeting the 2030 target.

Figure 6.2 **Share of renewable energy in gross final energy consumption, EU**



Source: Eurostat/EEA.

Relevance and policy target

- An increase in the use of renewable energy has multiple benefits for society, such as mitigating climate change, reducing the emission of air pollutants and improving energy security.
- The EU's target is to increase the share of renewable energy sources in gross final energy consumption to 42.5% by 2030 ([5]).

Indicator past trend (2005-2022): increase ↑
Latest value (2022, preliminary): 22.5%

- The share has more than doubled between 2005 and 2022 and reached 22.5% in 2022, according to early estimates by the EEA. Progress so far is attributed to dedicated policies and support schemes, as well as the improved economic competitiveness of renewable energy sources.
- Solid biomass remains the most significant fuel in the renewable energy mix, with 41% in 2021, followed by wind (13%), hydropower (12%), liquid biofuels (8%) and biogas (6%). Solar photovoltaic and ambient heat from heat pumps each represented less than 6%; however, they are the fastest growing sources ([i]) ([6]).

2030 outlook

- It is unlikely but uncertain that the EU will meet its target by 2030. Reaching the target will require the average rate of growth of the share of renewable energy sources in the years up to 2030 to reach more than double the rate observed over the past 10 years.
- Nevertheless, modelling from the IEA ([7]) and Ember ([8]) indicates that reaching the new 42.5% target might be feasible if fast and decisive action is taken to promote renewables and reduce energy consumption. The surprisingly rapid deployment of technologies such as solar photovoltaic and heat pumps also provides some optimism.
- A deep transformation of the European energy system would be needed within this decade if the target is to be met.

For more references and additional information, including at country level, see the full indicator version.

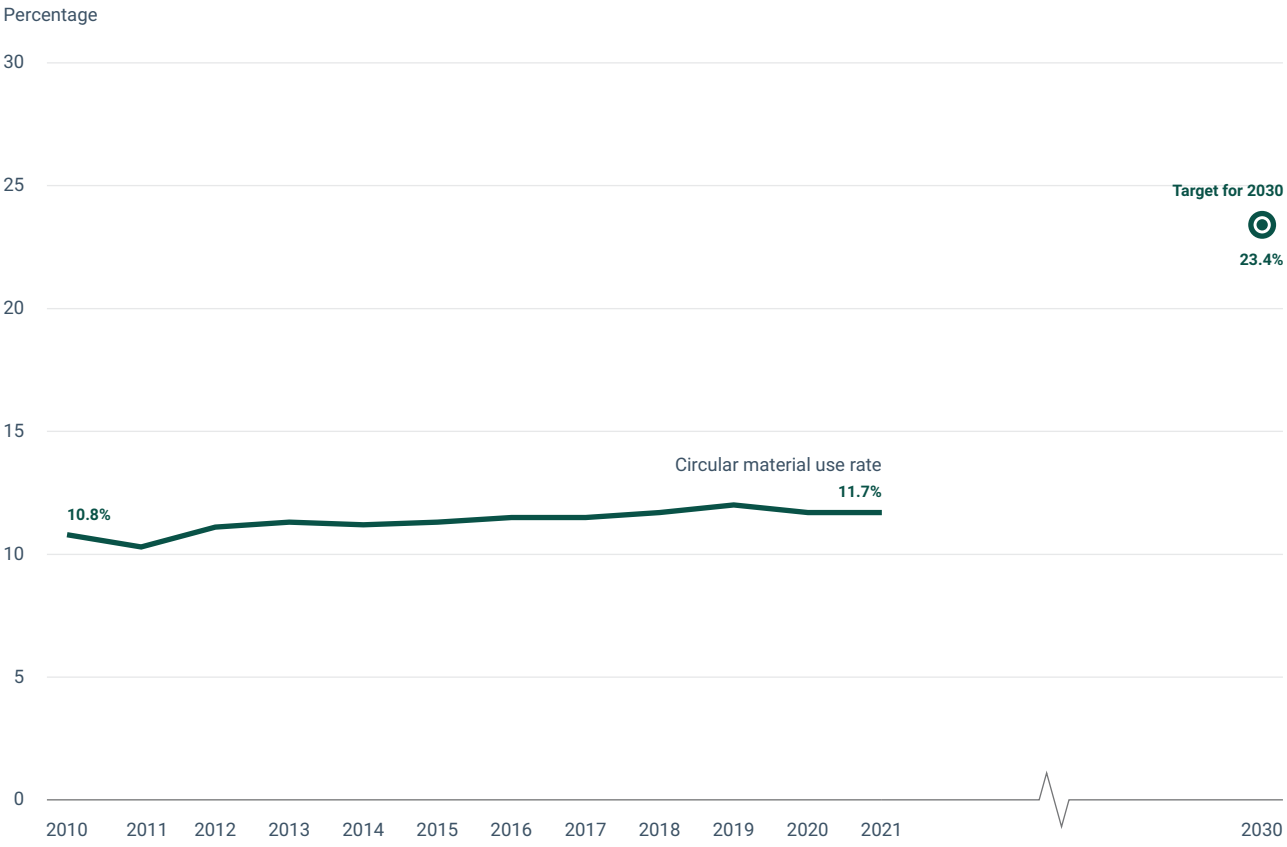
([i]) The comparison among renewable energy sources is based on total energy supply from the Eurostat EU complete energy balances of 2021 – see endnote number 6 for a full reference. The 2022 balance was not available at the time of writing this indicator and, consequently, that paragraph refers to 2021 data.

Circular material use:

Will the rate of circular material use double by 2030 from 2020 levels?

Very unlikely. Meeting the target requires the average annual pace of increase of the rate to be six times higher compared to that of the last decade. The past progress has been very slow and projections show an increased demand for materials in the EU by 2030.

Figure 6.3 **Circular material use rate, EU**



Source: Eurostat.

Relevance and policy target

- The circular material use rate (CMUR) measures the share of material recovered and fed back into the economy in overall material use. Increasing the CMUR — whether by increasing the amount of recycled waste or decreasing the amount of primary material used — would reduce the amount of primary material extracted for production and the associated negative impacts on the environment and climate. It would also improve the EU's strategic autonomy by reducing reliance on primary resources, including imported materials.

- The EU circular economy action plan ([9]) aims to double the CMUR by 2030 compared to 2020.

Indicator past trend (2010-2021): increase ↑
Latest value (2021): 11.7%

- The CMUR increased from 10.8% in 2010 to 11.7% in 2021, mainly due to increases in the amount of waste recycled. Domestic material consumption has remained relatively stable ([10]).

- Non-metallic minerals account for more than 50% of total material consumption. The other material group categories are biomass, metal ores and fossil energy materials/carriers.

2030 outlook

- Meeting the target of doubling the CMUR would mean an increase from 11.7% in 2021 to 23.4% by 2030, and the annual compound growth rate of 2011-2021 would have to increase more than sixfold. This is very unlikely considering the very slight increase in the CMUR in the previous decade, no increase at all between 2020 and 2021 and projections by the OECD predicting increased future virgin demand for materials in the EU by 2030 ([11]).

- Reaching the 2030 target would require both significantly reducing material consumption and substantially boosting recycling. Reducing the use of the bigger material groups — non-metallic minerals and metals — has a greater potential for increasing the CMUR. However, since not all material groups have the same environmental consequences, to maximise environmental benefits, measures should also focus on reducing consumption of fossil energy materials and increasing the sustainability of biomass production ([12]).

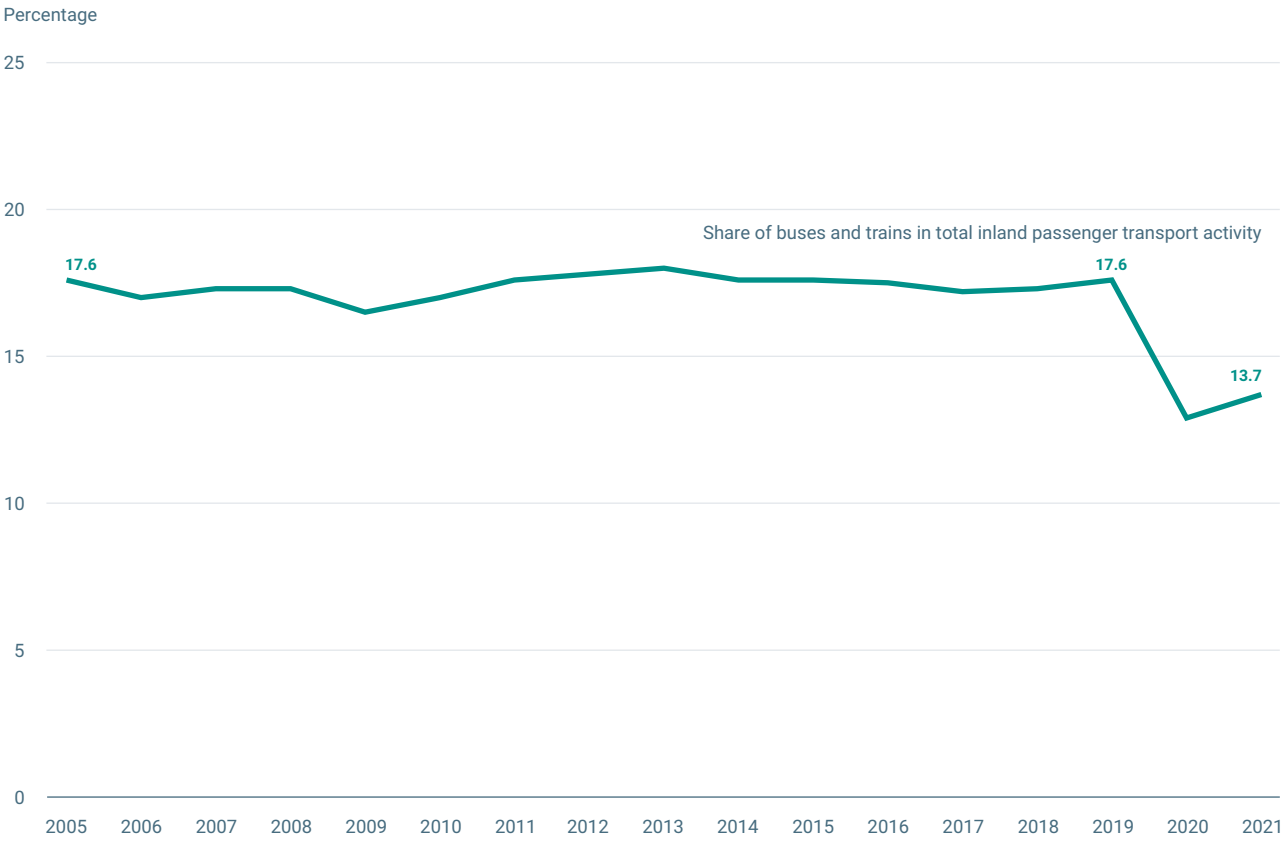
For more references and additional information, including at country level, see the full indicator version.

Buses and trains:

Will the share of collective transport modes (buses and trains) in inland passenger transport increase in the coming years?

Unlikely but uncertain. There has not been any real progress over the years and there is currently no comprehensive policy framework promoting a shift of passenger transport towards public transport.

Figure 6.4 **Share of buses and trains in total inland passenger transport activity, EU**



Source: Eurostat.

Relevance and policy target

- Promoting sustainable and more efficient transport modes such as collective passenger transport reduces greenhouse gas emissions and other environmental pressures such as air pollution and noise ([13]). The European Commission's sustainable and smart mobility strategy ([14]) of the European Green Deal ([15]) called for decisive action to increase passenger use of public transport such as buses and trains.

Past trend (2005-2021): stable (2005-2019) →, decrease (2019-2021) ↓
Latest value (2021): 13.7%

- From 2005 to 2019, the share of collective transport in total inland passenger transport remained constant at 17.6% and decreased in 2019-2021, mainly due to travel restrictions and changed mobility habits brought about by the COVID-19 pandemic and its aftermath ([16]).

- The share was 13.7% in 2021.

2030 outlook

- It is unlikely but uncertain that a modal shift towards more public transport will occur in the coming years. There has been persistent lack of progress in past years.

- Decisive action to encourage the use of public transport would be needed to achieve this objective. This would require changes in the way Europeans commute and travel, and in the way European cities are planned. Examples of these actions could be an increased availability and reliability of public transport, the reduction of public transport ticket prices and the introduction of digital solutions that promote intermodality and integrated ticketing. Similarly, investments and funding are also needed to finance safe, clean and modern infrastructure to ensure access to public transport for all ([17]).

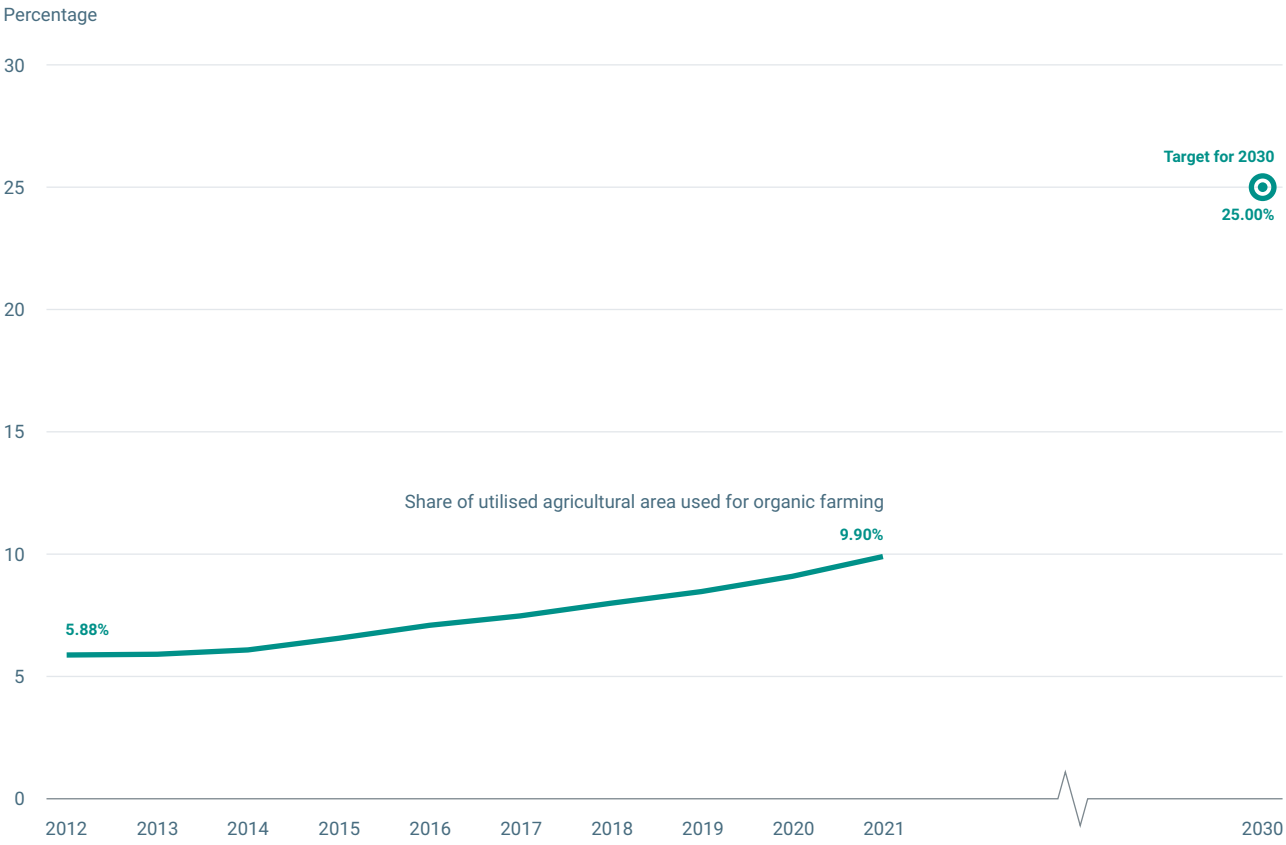
For more references and additional information, including at country level, see the full indicator version.

Organic farming:

Will the share of organic farming expand to at least 25% of EU agricultural land by 2030?

Very unlikely. Current policies in place and public support will most likely increase the share of organic farming but not sufficiently to meet the target. Meeting the target requires the pace in the increase of the share to almost double compared to that of the last decade.

Figure 6.5 **Share of utilised agricultural area used for organic farming, EU**



Source: Eurostat.

Relevance and policy target

- Organic farming produces food using natural substances and processes, which benefits biodiversity, soil health, water quality and animal welfare.
- The European Green Deal and its strategies on biodiversity ([18]) and farm to fork ([19]) aim to have at least 25% of EU agricultural land organically farmed by 2030.

Indicator past trend (2012-2021): increase ↑
Latest value (2021): 9.9%

- Organic farming has been continuously increasing since 2012 and reached 9.9% of EU agricultural land as a result of dedicated measures and a growing demand for organic products.

2030 outlook

- It is very unlikely that the 25% target will be met by 2030. For this to happen, the annual rate of increase of the organic farming share will have to almost double in 2021-2030 compared to that of 2012-2021.
- A continued increase in the share of organic farming is expected by 2030, driven inter alia by increasing policy support through the common agricultural policy (2023-2027) ([20]) and initiatives under the EU organic action plan ([21])([22]).
- However, the current policy measures and short- and medium-term decrease in demand for organic products due to unfavourable economic conditions point to a share of organic farming area lower than 25% in 2030 ([23])([24])([25]).
- To reach the target, accelerated development and implementation of coherent policies with increased ambitions need to support a fundamental transformation of food production and consumption systems.

For more references and additional information, including at country level, see the full indicator version.

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8TH EAP

Enabling conditions

7 Enabling conditions

Conditions enabling achievement of the 8th Environment Action Programme priorities

The 8th Environment Action Programme (EAP) ([1]) set out six 2030 environment- and climate change-related priority objectives and a 2050 objective of living well within planetary boundaries. To meet these objectives, many enabling conditions need to be fulfilled.

The European Commission's 8th EAP monitoring framework ([2]) includes five indicators and corresponding 2030 targets to capture aspects of progress related to conditions that enable the fulfilment of the 8th EAP objectives:

- An indicator on environmental taxes to monitor whether there will be an increase in the EU share of environmental taxes in total tax revenues in the EU.
- An indicator on EU fossil fuel subsidies to monitor whether fossil fuel subsidies will decrease, with a view to phasing them out without delay.
- An indicator on environmental protection expenditure to monitor whether EU spending on preventing, reducing and eliminating pollution as well as other environmental degradation will increase.
- An indicator on green bonds to monitor if the share of green bonds in the total issued bonds will increase in the EU.
- An indicator on the eco-innovation index to monitor if eco-innovation will increase in the EU.

The indicator assessment results are summarised further below. In short, it is unlikely but uncertain that fossil fuel subsidies will decrease in the coming years. Developments in all other indicators are, however, moving towards meeting the 2030 targets. The high environmental and climate ambition of the European Green Deal ([3]) and its initiatives is a key driver of these positive developments. Nevertheless, these do not seem to be enough at present to produce the desired results in environmental protection and climate change.

The European Commission estimated additional investment needs of approximately EUR 620 billion per year from 2021 to 2030 ([4]) to deliver on the environmental and climate change objectives of the European Green Deal and of REPowerEU ([5]). Increases in the EU budget, the creation of the Recovery and Resilience Facility ([6]), which aims to support the EU recovery from the COVID-19 pandemic, and the implementation of the sustainable finance framework ([7])([8]) are all expected to trigger additional capital flows in Member States towards sustainable investment. It remains to be seen, however, if these will be enough to fill the investment gap by 2030.

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

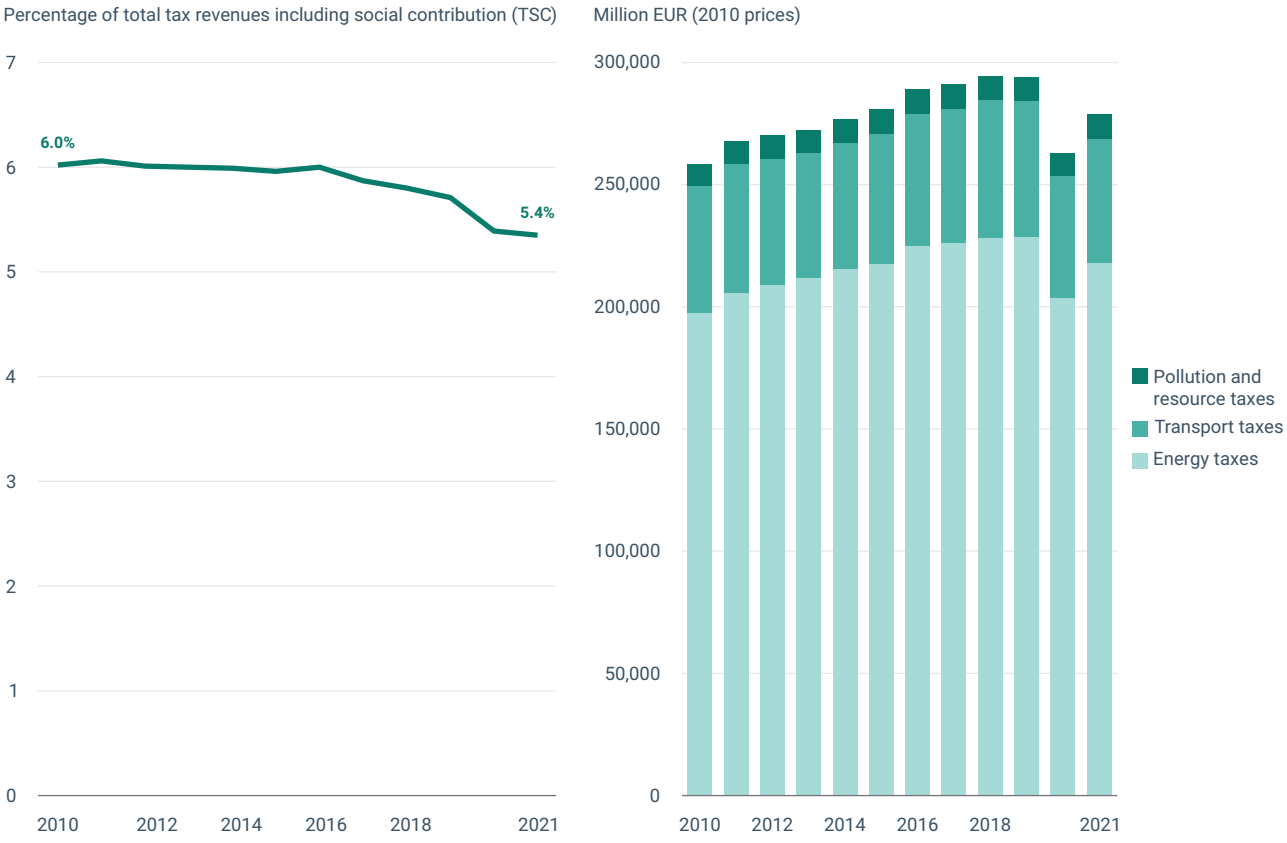
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Environmental taxes:

Will the share of environmental taxes in total revenues from taxes and social contributions increase in the coming years?

Likely but uncertain. Increased ambition and scope of emissions trading support a positive trend towards 2030.

Figure 7.1 **Environmental tax revenues: share in total revenue from taxes and social contributions, and absolute value, EU**



Source: Eurostat.

Relevance and policy target

- Environmental taxes provide price signals and incentives to producers and consumers to pollute less and use resources carefully. Making polluters pay is at the core of EU environmental policy ([9]).

Indicator past trend (2010-2021): decrease ↓
Latest value (2021): 5.4%

- The share of environmental taxes in total tax revenues dropped from 6.0% in 2010 to 5.4% in 2021. This is because it is politically difficult to make changes to a country's tax system due to the perceived and real economic and social challenges associated with the price increase of the affected goods and services.

2030 outlook

- It is likely that the share will increase by 2030 because of the recently heightened ambition and augmented scope of the EU's emissions trading system ([10]). This is, however, uncertain because the expected rise in revenues from the emissions trading may be offset by a fall in revenues from the current energy taxation schemes due to the significant recent increase of greenhouse gas emission reduction targets ([11]).

- Post 2030, any rise in environmental tax revenues will be challenging because the expected technological breakthroughs in energy and transport in the transition to a low-carbon, green economy are expected to erode the environmental tax base. At present, energy taxes are the largest environmental tax revenue and, with transport taxes, jointly contribute 96% to the total environmental tax revenues.

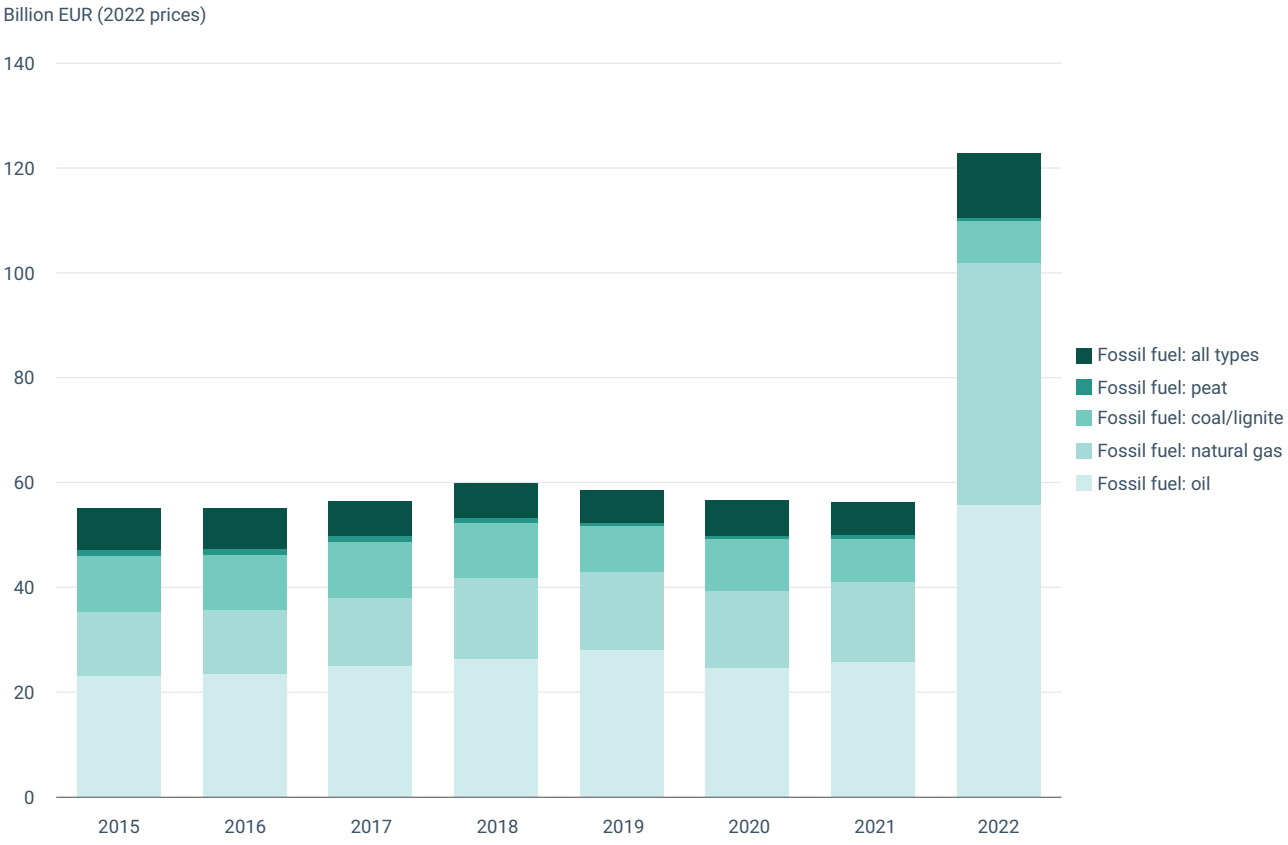
For more references and additional information, including at country level, see the full indicator version.

Fossil fuel subsidies:

Will fossil fuel subsidies be reduced in the coming years with a view to phasing them out without delay?

Unlikely but uncertain. There is a lack of concrete phase-out plans in most EU countries.

Figure 7.2 **Fossil fuel subsidies, EU**



Source: European Commission.

Relevance and policy target

- Fossil fuels are non-renewable sources of energy, and their production and use contribute significantly to climate change and pollution.
- In line with international commitments, the 8th EAP calls for a phase-out of subsidies to fossil fuels such as coal, gas and oil without delay.

Indicator past trend (2015-2022, in 2022 prices): stable (2015-2021) →, increase (2021-2022) ↑
Latest value (2022, preliminary): EUR 123 billion

- Fossil fuel subsidies remained more or less stable at around EUR 56 billion (2022 prices) over the 2015-2021 period, with almost half of the subsidies supporting oil and more than a quarter supporting natural gas.
- An increase in fossil fuel subsidies of almost 120% occurred between 2021 and 2022 in response to the high energy prices driven by the Russian invasion of Ukraine ([12]).

2030 outlook

- It is unlikely but uncertain that there will be much progress in phasing out fossil fuel subsidies by 2030.
- At present, most Member States do not have concrete plans on how and by when they intend to phase out fossil fuel subsidies ([13]).
- The sharp rise in subsidies in 2022 is, nevertheless, considered temporary, as for 47% of total fossil fuel subsidies in 2022 there is a planned end date before 2025 ([14]).

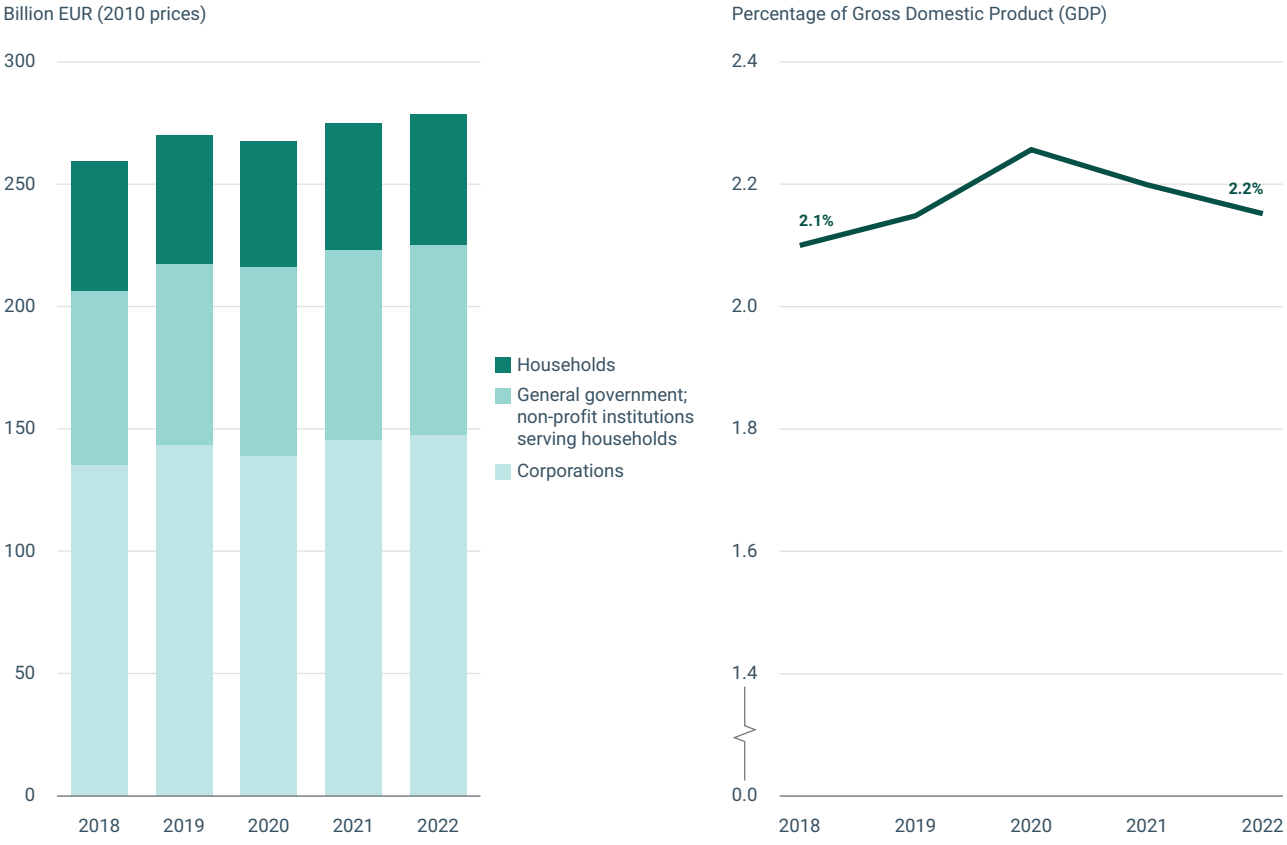
For more references and additional information, including at country level, see the full indicator version.

Environmental protection expenditure:

Will it increase in the coming years?

Very likely. Additional resources have been made available in the EU budget, and in grants and loans under the EU Recovery and Resilience Facility.

Figure 7.3 **Environmental protection expenditure and share of environmental protection expenditure in gross domestic product, EU**



Source: Eurostat.

Relevance and policy target

- The environmental protection expenditure (EPE) captures expenditure related mainly to pollution abatement, protection of biodiversity, management of wastewater and waste, environmental research and development. EPE only partly captures expenditure related to climate change and to the circular economy ([i])([15]).

- The EU must increase environment and climate-related expenditure and therefore also EPE in order to meet the objectives of the European Green Deal.

Indicator past trend (2018-2022, in 2010 prices): increase ↑
Latest value (2022): EUR 278 billion

- In real terms (2010 prices), EPE increased in the EU by 7% between 2018 and 2022 and reached EUR 278 billion in 2022. Most has been spent on waste management and wastewater treatment activities ([16]). Additionally, most of the EPE is spent on operating expenditure, and only around 20% was spent in 2022 in investments (EUR 56 billion) ([17]).

- The EPE share in GDP remained relatively stable at around 2.0% of GDP over the 2018-2022 period. The increase in this share in 2020 was an anomaly caused by the decline in GDP during the COVID-19 pandemic.

2030 outlook

- It is very likely that EPE will increase in the coming years, as additional resources — funding, loans, guarantees — have been made available to this effect through increases in the EU budget, the NextGenerationEU recovery plan and sustainable finance actions ([18]) ([19])([20]).

- Nevertheless, the European Commission estimates that an additional investment of EUR 77 billion per year is necessary from 2021-2030 to achieve the environmental objectives for the areas covered under the EPE ([21]). It is too early to know if the additional resources will trigger the necessary capital flows to fill the investment gap by 2030.

For more references and additional information, including at country level, see the full indicator version.

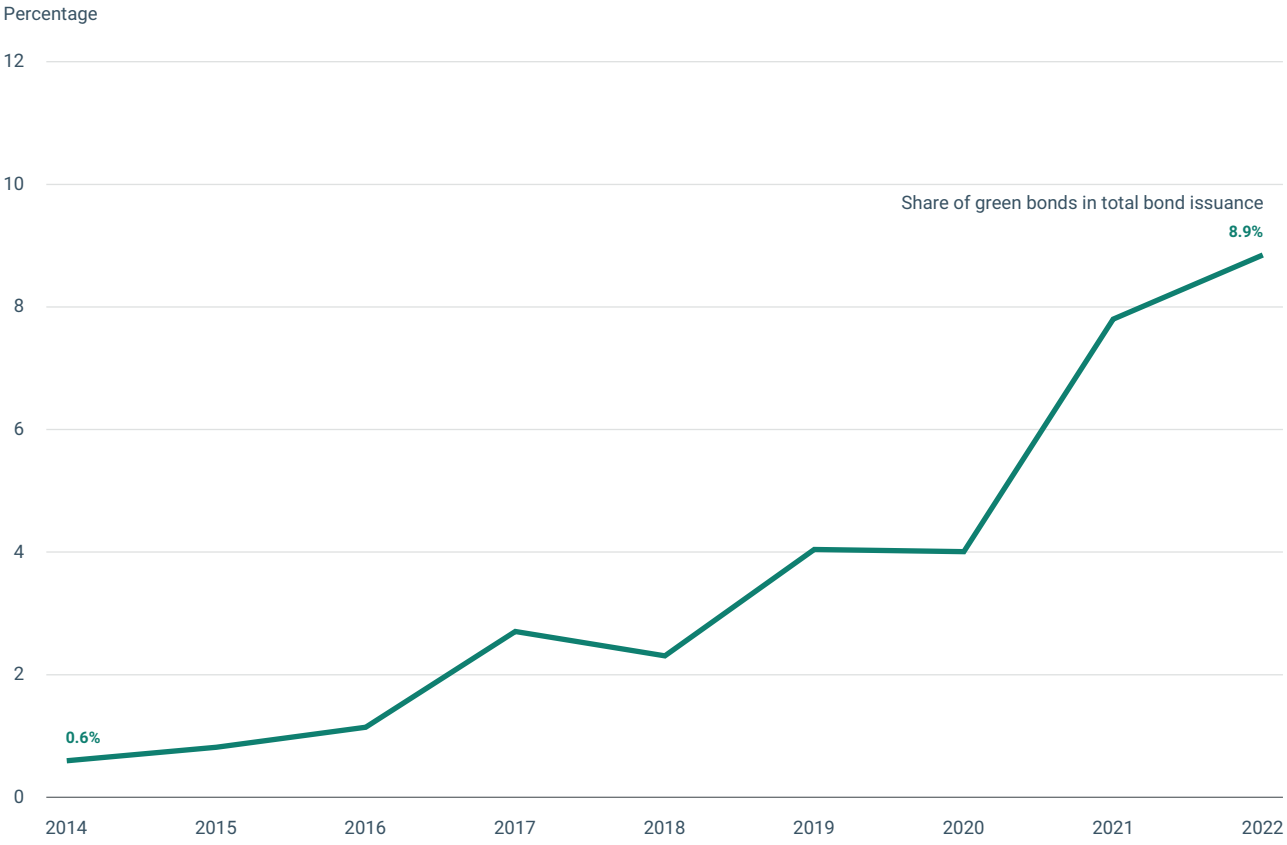
([i]) This does not capture expenditure on the production of renewable energies, energy efficiency in general or climate adaptation. However, it now includes expenditure on clean transport (vehicles and charging systems) as directly contributing to reducing air pollution.

Green bonds:

Will the share of green bonds in total issued bonds increase in the coming years?

Likely but uncertain. The ambitious environmental and climate goals of the European Green Deal may further increase this trend towards 2030.

Figure 7.4 **Share of green bonds in total bond issuance, EU**



Source: Refinitiv EIKON/ESMA/EEA.

Relevance and policy target

- Green bonds use the proceeds to finance green projects, assets or specific business activities that address environment and climate change issues.
- The European Green Deal underlines the need to redirect capital flows to green investments, which can be achieved through issuing green bonds, among others.

Indicator past trend (2014-2022): increase ↑
Latest value (2022): 8.9%

- The share of green bonds in the total issued bonds increased in the EU from 0.6% in 2014 to 8.9% in 2022. All entities issuing green bonds — governments, corporations, supranational bodies, municipalities and agencies — increased their issuance, although at different rates.
- The increase reflects the increasing demand from investors to finance green projects and activities, and the growing interest of the financial sector in offering financial instruments that support them.

2030 outlook

- It is likely but uncertain that the share of green bonds in total bonds issued will increase in the coming years, for several reasons.
- The demand for green bonds will remain high — driven, inter alia, by the ambitious environmental and climate objectives of the European Green Deal. Additionally, the European Commission intends to issue more green bonds to fund the NextGenerationEU recovery plan ([22]). Finally, the framework conditions for sustainable finance have been changing in the EU, with the aim of boosting sustainable investment and thereby the issuance of green bonds ([23]).

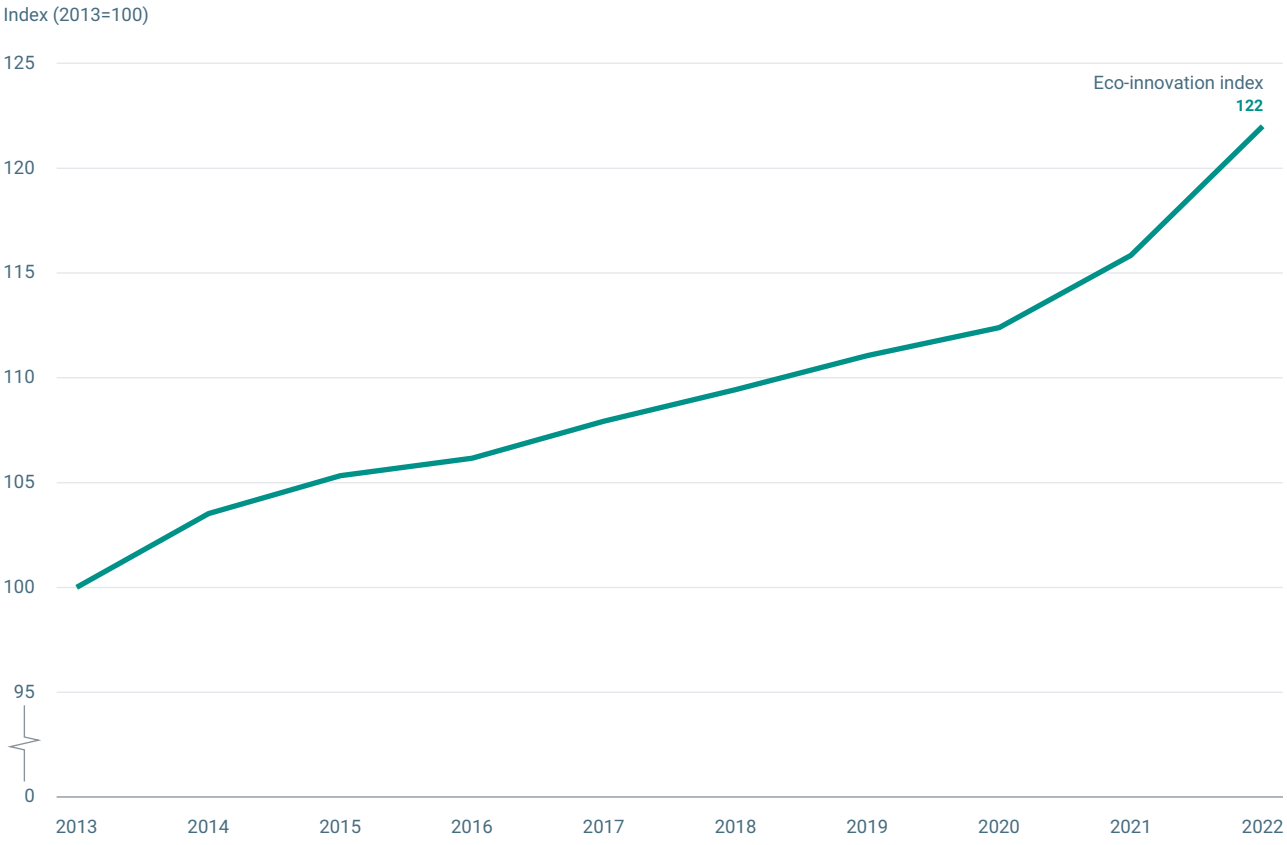
For more references and additional information, including at country level, see the full indicator version.

Eco-innovation:

Will eco-innovation increase in the coming years?

Very likely. The ambitious environmental and climate objectives of the European Green Deal and associated initiatives create favourable conditions for more eco-innovation towards 2030.

Figure 7.5 **Eco-innovation index, EU**



Source: European Commission/Eco-Innovation Observatory.

Relevance and policy target

- Eco-innovation is any innovation that reduces impacts on the environment, increases resilience to environmental pressures or uses natural resources more efficiently ([24]).

- Eco-innovation is essential to achieving a transition to the carbon-neutral and sustainable economy as set out in the European Green Deal.

Indicator past trend (2013-2022): increase ↑
Latest value (2022): 122 (2013=100)

- The European Commission eco-innovation index shows an increase from 2013 to 2022, mainly driven by improvements in various aspects of resource efficiency ([25]).

2030 outlook

- It is very likely that there will be further increases in the eco-innovation index in the coming years.

- This is because of the continuous increase over the years and because of the high ambition of the environmental and climate objectives of the European Green Deal and its ensuing initiatives, which will most likely drive further progress in eco-innovation ([26]).

For more references and additional information, including at country level, see the full indicator version.

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8TH EAP LONG TERM PRIORITY OBJECTIVE
Living well, within planetary boundaries

8 Living well, within planetary boundaries

Our societies and economies depend on a healthy planet. The EU and the world have already transgressed several planetary boundaries ([1])([2])([3]). The EU's 8th Environment Action Programme (EAP) ([4]) requires that by 2050, EU citizens live well within the limits of the planet in a wellbeing economy.

To capture progress towards aspects of this long-term objective, the European Commission's 8th EAP monitoring framework ([5]) includes six indicators and corresponding 2030 targets:

- An indicator on land take to monitor whether the EU will meet its goal of no net land take by 2050.
- An indicator on water scarcity conditions (water exploitation index plus) to monitor whether the EU will reduce water scarcity.
- An indicator on the consumption footprint to monitor whether the EU will significantly reduce the environmental impact of its consumption to bring it within planetary boundaries as soon as possible.
- Two indicators on employment and gross value added of the environmental goods and services sector to monitor whether the share of the green economy and green employment in the whole economy will increase in the EU.
- An indicator on environmental inequalities to monitor whether the EU will reduce environmental inequalities and ensure a fair transition. In the absence of an available indicator that covers all environmental inequalities, an indicator on income-related environmental inequalities associated with exposure to air pollution (fine particulate matter) has been used as a proxy, albeit an imperfect one.

The indicator assessment results are summarised further below. It is very likely that the 2030 targets related to the green economy and green employment indicators will be met. This is because the need to fulfil the significant ambitions of the environmental and climate policy in the European Green Deal ([6]) in the context of the EU's ongoing green transition will very likely increase the EU's green economy and green jobs.

On the other hand, the prospects of meeting by 2030 the objectives associated with the remaining indicators are not good. It is very unlikely that the consumption footprint target will be met by 2030. Projections by the European Commission ([7]) show that based on current consumption patterns and expected economic growth, the EU will not reduce its footprint in the coming years. The total footprint is mainly driven by food consumption patterns, housing and mobility.

It is also unlikely but uncertain that the targets on land take, water scarcity and environmental inequalities will be met by 2030. Projections show that built-up areas will expand in the EU by 2030, hampering the prospects of achieving the 2050 'no net land take' goal. The pressure of climate change may reduce water availability further, making it challenging to reduce ongoing water scarcity problems in the coming years. Finally, although the income-related environmental inequalities associated with air pollution are an imperfect proxy of environmental inequalities, it is, nevertheless, important to note that it seems unlikely that this indicator will show improvements.

The methodology used to determine the prospects of meeting the 2030 targets is described in Annex 2. It is also explained in the following key:

Methodology key

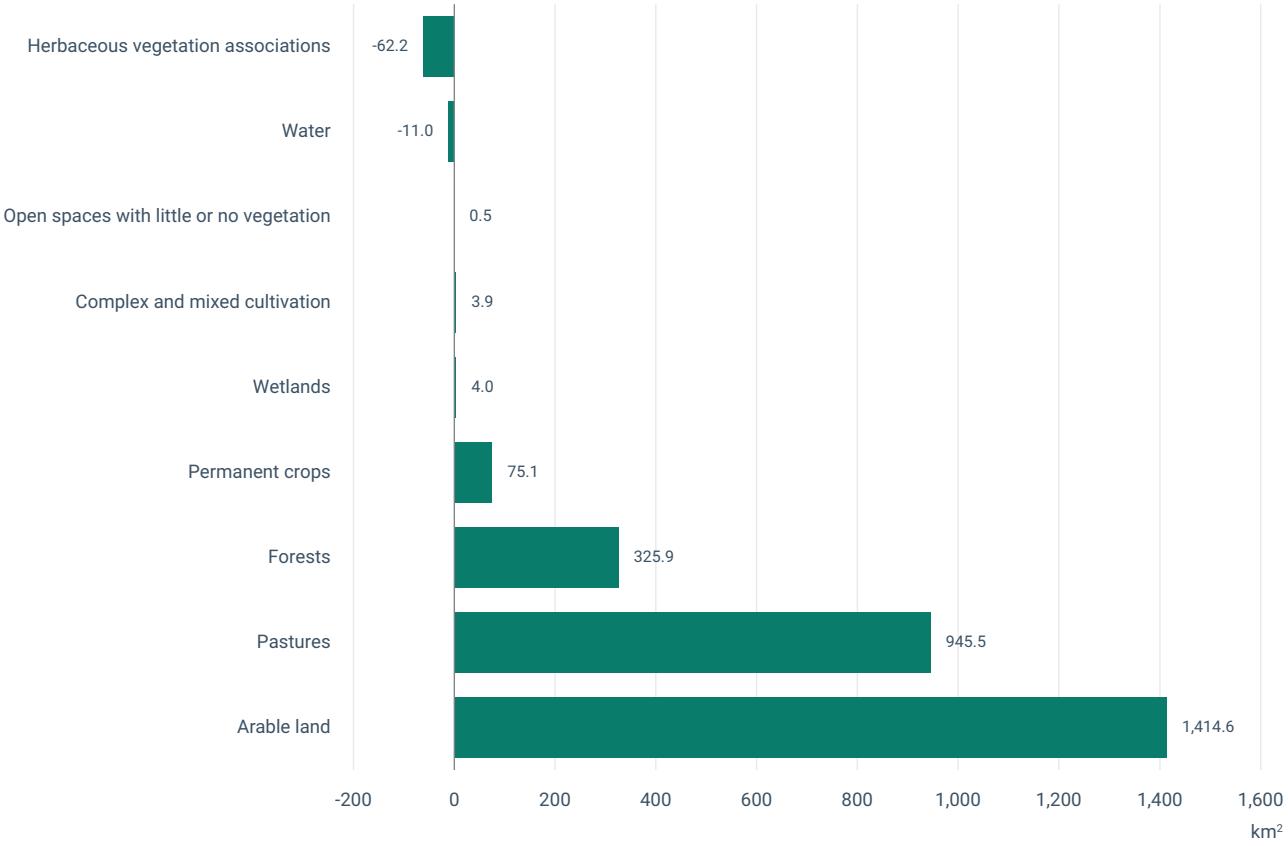
Will the objective be met by 2030?	
It is very likely	i.e. it answers 'yes' with a high degree of confidence to the question
It is likely but uncertain	i.e. it answers 'maybe yes' to the question
It is unlikely but uncertain	i.e. it answers 'maybe no'
It is very unlikely	i.e. it answers 'no' with a high degree confidence
It is unclear	i.e. the prospects cannot be determined (e.g., insufficient data/evidence, no correlation between indicator and selected objective)

Land take:

Will the EU achieve the goal of no net land take by 2050?

Unlikely but uncertain. Projections indicate a likely expansion of built-up areas in the coming years. In addition, it is currently unclear how the drivers of land take will evolve and whether reconverting artificial surfaces to land will increase sufficiently.

Figure 8.1 **Net land take in cities and commuting zones, EU**



Source: EEA/Copernicus Land Monitoring Service.

Relevance and policy target

- Land take entails the conversion of land to artificial surfaces. This impairs the valuable ecological functions of land such as carbon sequestration and makes ecosystems less resilient. It can also impact the quality of life through diminished land functions (e.g. lost protection from floods and increased urban temperature when the soil is sealed) and direct loss of natural areas for relaxation, regeneration and outdoor activities.

- The soil strategy for 2030 ([8]) sets the aim of 'no net land take by 2050'.

Indicator past trend (2012-2018): unclear
Latest value (2012-2018 which is one assessment period): 450 km^2 annual average

- In Europe, most land take occurs in cities and commuting zones, which are the areas this indicator focuses on. Between 2012 and 2018, net land take in the EU in these zones was on average 450 km^2 annually.

- The taken land was mostly cropland and pasture, followed by forest. Major drivers of land take include population growth, the need for transport infrastructure, cultural preferences and economic growth ([9]).

2030 outlook

- For the EU to reach its aim of 'no net land take by 2050', there need to be significant reductions in net land take over the years. At present, this is uncertain but unlikely.

- It is unclear how the main drivers of land take will change and whether reconverting artificial surfaces to land will increase sufficiently in the future. Current projections by the European Commission Joint Research Centre indicate a likely expansion of built-up areas in the coming years ([10]).

- Discouraging diffuse urban expansion while promoting compact, multi-storey city planning with better land-use efficiency and the re-naturalisation of land instead would be an important means to reduce land take rate and reach the 2050 goal ([11]).

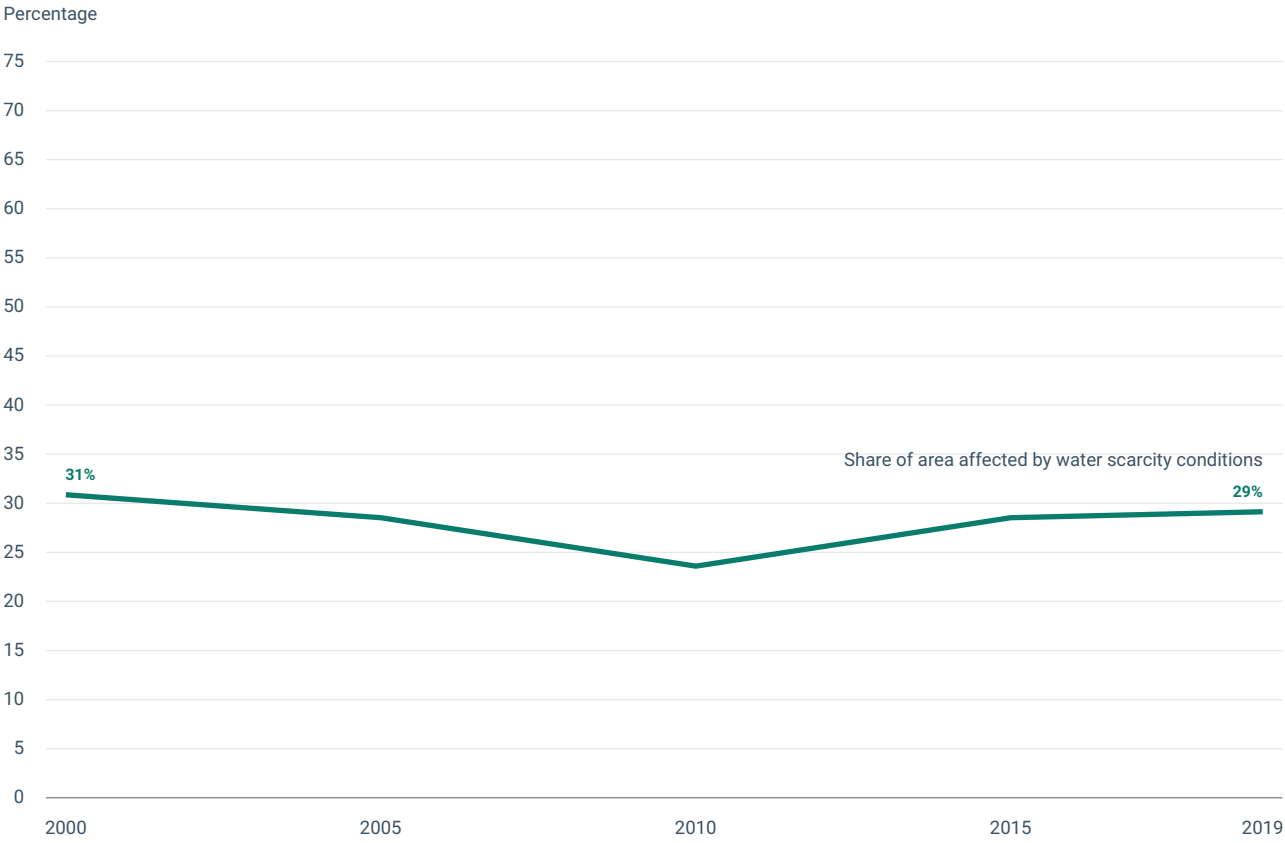
For more references and additional information, including at country level, see the full indicator version.

Water scarcity (water exploitation index plus):

Will the EU land area affected by water scarcity decrease in the coming years?

Unlikely but uncertain. There has been no progress so far while climate change may further reduce water availability.

Figure 8.2 **Share of area affected by water scarcity conditions, measured by the water exploitation index plus, EU**



Source: EEA/Eurostat/OECD/Joint Research Centre/Ecrins.

Relevance and policy target

- Freshwater resources are essential for human health, nature, and the functioning of economies and societies.
- The EU water framework directive ([12]) requires Member States to promote the sustainable use of water and protect available water resources.

Indicator past trend (2000-2019): stable →
Latest value (2019): 29%

- The EU land area affected by water scarcity conditions remained relatively stable over the 2000-2019 period. In 2019, it affected 29% of the EU territory in at least one season. Although total water abstraction reduced by 15% over the period, water availability also decreased because of climate change impact.
- While water scarcity is more prevalent in southern Europe, it extends to river basins across the EU, in particular in western Europe ([13]).

2030 outlook

- It is unlikely but uncertain that water scarcity will decrease by 2030. There has been no progress so far, and climate change may reduce availability because of rising temperatures and more frequent drought events ([14]).
- Additional effort is needed to ensure sustainable water use.

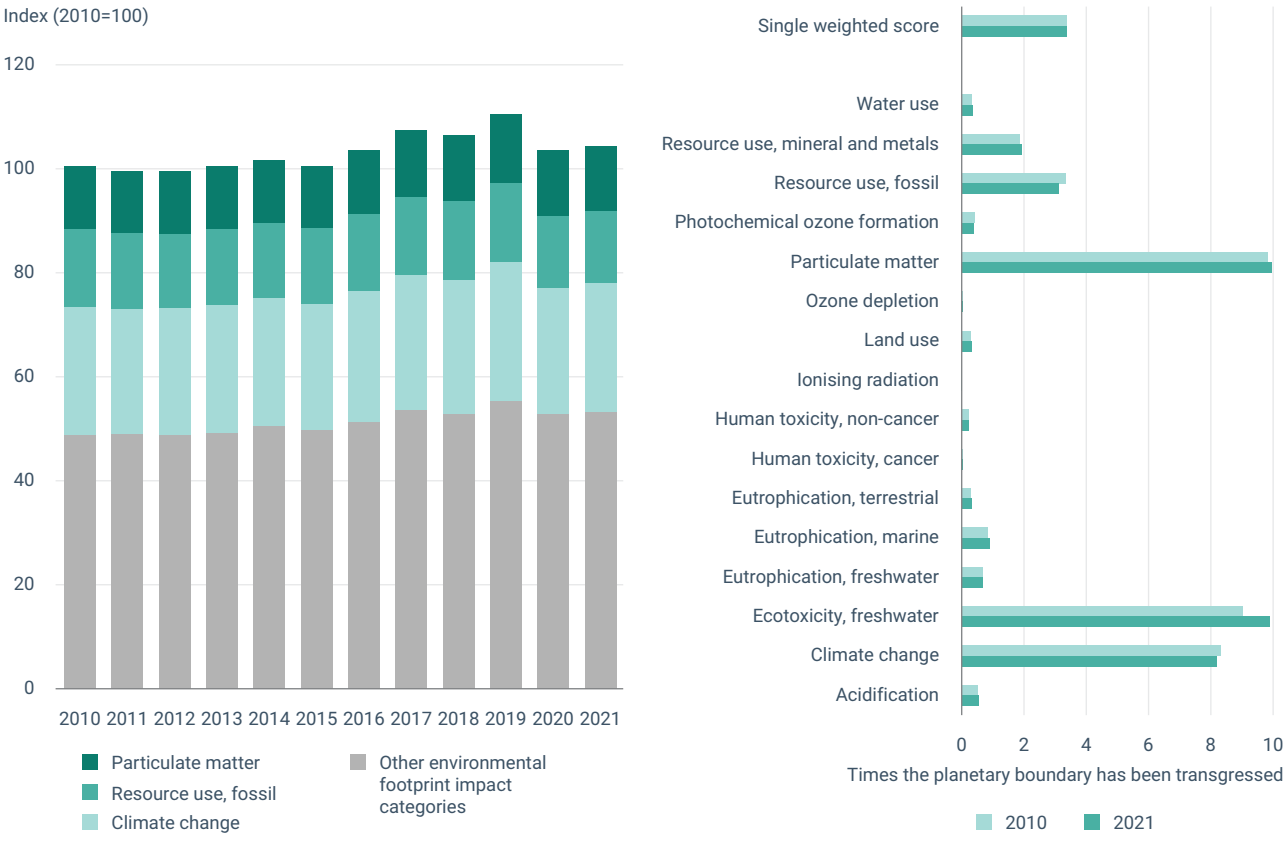
For more references and additional information, including at country level, see the full indicator version.

Consumption footprint:

Will the EU significantly reduce its consumption footprint in the coming years?

Very unlikely. The EU consumption footprint is projected to increase further by 2030 based on current consumption patterns and expected economic growth.

Figure 8.3 **Consumption footprint based on the life cycle method, EU**



Source: Joint Research Centre.

Relevance and policy target

- The EU consumption footprint represents the environmental and climate change-related impacts of the consumption of goods and services by EU residents, irrespective of whether they are produced within or outside the EU.
- The 8th EAP calls for a significant reduction of the EU's consumption footprint to bring it within planetary boundaries as soon as possible.

Indicator past trend (2010-2021): increase ↑
Latest value (2021): 104 (2010=100)

- From 2010 to 2021, the consumption footprint increased, albeit slightly, by around 4%. Climate change, the use of fossil resources and the release of particulate matter were, across the years, consistently the three largest contributors to the environmental and climate change-related impact of the consumption footprint. Together, they accounted for about 50% of the overall impact.
- Overall, the environmental impact of EU citizen's consumption is considered high. Scientific evidence increasingly suggests that, based on current consumption footprint levels, the EU exceeds its fair share of planetary boundaries for five environmental impact categories, including particulate matter, climate change and resource use ([15]).

2030 outlook

- It is very unlikely that the EU will meet its aim of significantly reducing this footprint by 2030.
- The European Commission Joint Research Centre predicts that the EU's consumption footprint will increase further by 2030 based on current consumption patterns, in terms of both quantity and type of products consumed, and expected economic growth ([16]).
- Switching to less environmentally harmful products and services, and curbing increasing consumption levels, is necessary to reduce the consumption footprint and bring the impacts within planetary boundaries.

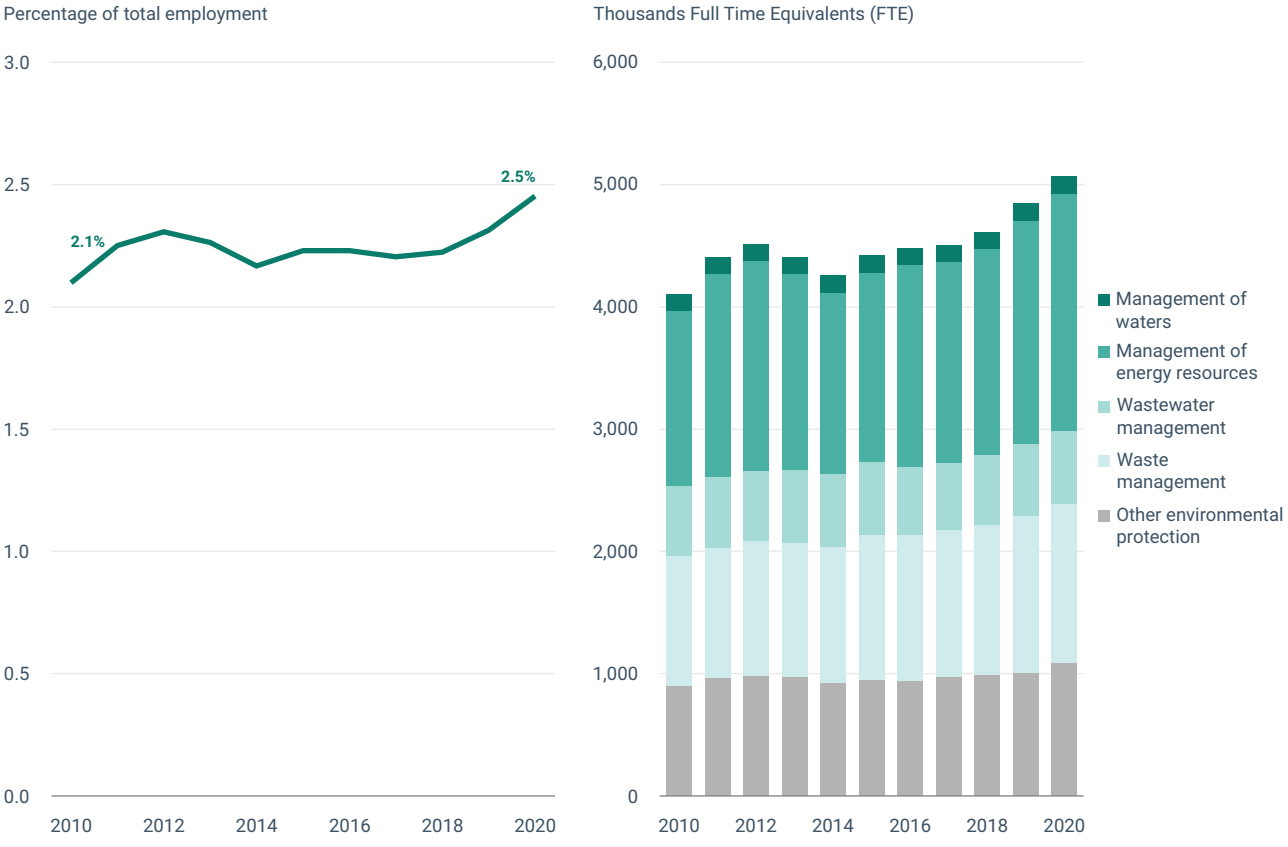
For more references and additional information, including at country level, see the full indicator version.

Green employment:

Will the share of green employment in the whole economy increase in the coming years?

Very likely. The ongoing green transition of the EU's economy driven by the environmental and climate objectives of the European Green Deal will further increase this trend towards 2030.

Figure 8.4 **Employment in the environmental goods and services sector: share in total employment and absolute value, EU**



Source: Eurostat.

Relevance and policy target

- Green employment is the employment created in the EU's environmental economy, also known as the green economy. This is the part of the economy that produces goods and services used in environmental protection and resource management activities.

- The European Green Deal aims for a green transition of the EU's economy and for the EU to become carbon neutral by 2050. The transition will require more green jobs and related skills.

Indicator past trend (2010-2020): increase ↑
Latest value (2020): 2.5%

- Employment in the green economy grew more quickly than employment in the whole economy in the EU in the last decade: it represented 2.1% of total EU employment in 2010 and 2.5% in 2020, reaching 5.1 million full-time equivalent employees in 2020. This was mainly because of job creation related to renewable energy, energy efficiency and waste management.

2030 outlook

- It is very likely that the share of green employment in the EU economy will rise in the coming years.

- The policies, measures and investments the EU is putting in place to support the green transition will create more green jobs by 2030, in particular in relation to applying circular economy principles and moving towards a low-carbon economy ([17])([18])([19]).

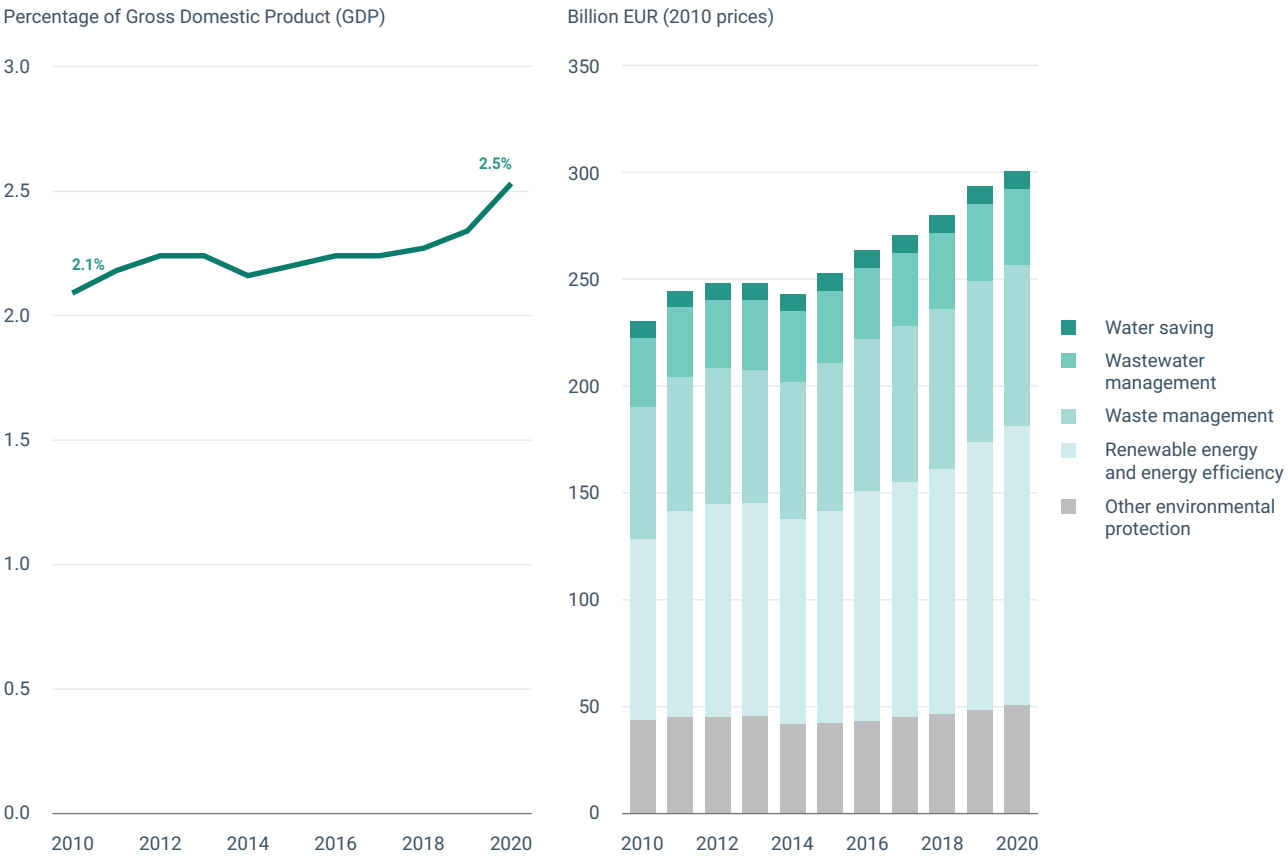
For more references and additional information, including at country level, see the full indicator version.

Green economy:

Will the share of the green economy in the whole economy increase in the coming years?

Very likely. The ongoing green transition of the EU's economy is driven by the environmental and climate objectives of the European Green Deal.

Figure 8.5 **Gross value added of the environmental goods and services sector: share of gross domestic product and absolute value, EU**



Source: Eurostat.

Relevance and policy target

- The green economy, also known as the environmental economy, is the part of the economy that produces goods and services used in environmental protection and resource management activities.
- The European Green Deal aims towards a green transition of the EU's economy and for the EU to become carbon neutral by 2050. This will need more economic activities related to environmental protection and resource management.

Indicator past trend (2010-2020): increase ↑
Latest value (2020): 2.5%

- The contribution of the added value of the EU green economy to the overall EU economy increased from 2.1% in 2010 to 2.5% in 2020 and reached just over EUR 300 billion (2010 prices) in 2020. This rise was mainly caused by significant increases in green economy activities related to resource management (renewable energy sources and energy efficiency) and waste management.

2030 outlook

- It is very likely that the contribution of the green economy to the EU GDP will increase in the coming years, to fulfil the high level of ambition of the environmental and climate policy of the European Green Deal.
- Increases are expected particularly in relation to applying circular economy principles and to moving towards a low-carbon economy (e.g. increased output from renewable energy resources and energy efficiency improvements) ([20])([21]). Furthermore, additional financial resources have been made available at EU level to support the expansion of the EU green economy ([22])([23]).

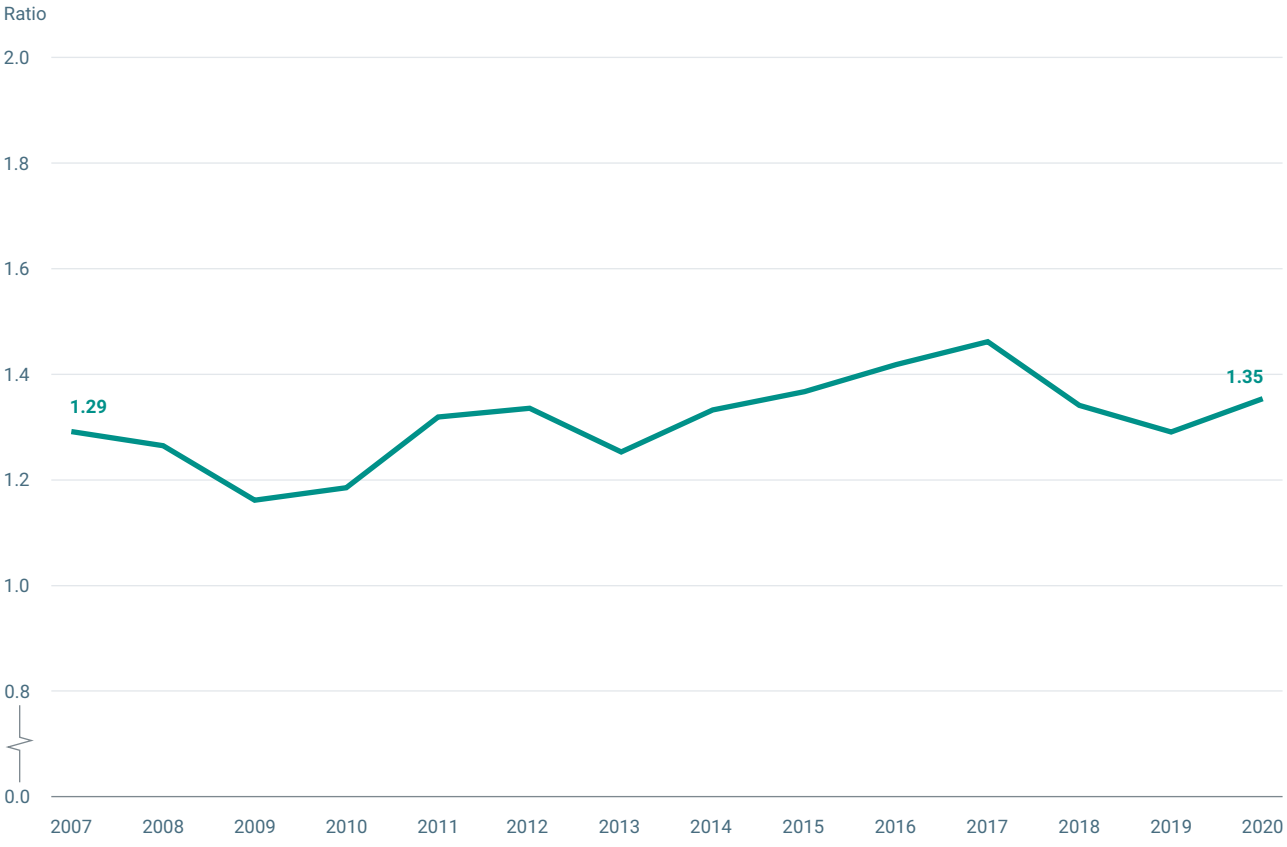
For more references and additional information, including at country level, see the full indicator version.

Environmental inequalities:

Will environmental inequalities decrease in the coming years?

Unlikely but uncertain, at least when it comes to air pollution, which is the scope of the currently available indicator. There has been no progress so far and there are no dedicated policies, at present, to address these environmental inequalities.

Figure 8.6 **Ratio of population-weighted concentrations of fine particulate matter in NUTS3 regions in the lowest per capita GDP quintile relative to those in the highest per capita GDP quintile, EU**



Source: EEA/Eurostat.

Relevance and policy target

- EU environmental policies have brought great benefits to EU citizens, for example, in terms of reduced pollution levels. However, questions remain as to whether the benefits or remaining impacts are distributed equitably within the EU.
- The 8th EAP requested that measures taken in the EU to protect the environment be carried out in a socially fair and inclusive way.
- Air pollution poses the greatest environmental risk to health in Europe ([24]) and fine particulate matter ($PM_{2.5}$) causes more attributed premature deaths in Europe than any other ambient air pollutant ([25]). Monitoring $PM_{2.5}$ levels is therefore considered a useful approach to exploring income-related inequalities in the distribution of the health impacts of air pollution and more broadly of environmental risks.

Indicator past trend (2007-2020): stable →
Latest value (2020): 1.35 ratio of population-weighted concentrations of $PM_{2.5}$ in the quintiles of the EU NUTS3 regions with the lowest per capita GDP (in purchasing power standard) relative to those in the most per capita GDP

- Despite improving trends in air pollution — measured as population-weighted concentrations of $PM_{2.5}$ in both the 20% highest per capita GDP and the 20% lowest per capita GDP regions (NUTS3) of the EU over the 2007-2020 period — inequalities remain. Levels of $PM_{2.5}$ are consistently higher by around one third in the poorest regions.
- Exposure at NUTS3 level is an imperfect proxy for actual inequalities in air pollution exposure, as it does not capture inequalities within each of the NUTS3 regions. No Europe-wide data on GDP exists at a level smaller than NUTS3.

2030 outlook

- With the past trend indicating no progress in reducing the environmental inequalities associated with air pollution, and in the absence of dedicated policies addressing such environmental inequalities, it is, at present, unlikely but uncertain that the EU will make progress in the coming years on reducing environmental inequalities, at least those related to air pollution ([26]).

For more references and additional information see the full indicator version.

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Annex 1 Key elements of the 8th Environment Action Programme decision

This annex outlines key elements of the 8th Environment Action Programme (EAP) decision ([1]) in relation to the 8th EAP priority objectives, enabling conditions, monitoring framework and governance, 8th EAP mid-term review and evaluation.

- **8th EAP priority objectives**

Article 2 of the 8th EAP lays down the 8th EAP long-term priority objective and the six thematic priority objectives as follows.

Article 2(1) outlines the **long-term priority objective** of the 8th EAP of **living well within the planetary boundaries**: 'The 8th EAP shall have the long-term priority objective that by 2050 at the latest, people live well, within the planetary boundaries in a well-being economy where nothing is wasted, growth is regenerative, climate neutrality in the Union has been achieved and inequalities have been significantly reduced. A healthy environment underpins the well-being of all people and is an environment in which biodiversity is conserved, ecosystems thrive, and nature is protected and restored, leading to increased resilience to climate change, weather- and climate-related disasters and other environmental risks. The Union sets the pace for ensuring the prosperity of present and future generations globally, guided by intergenerational responsibility.'

Article 2(2) outlines the **six thematic priority objectives** of the 8th EAP that address: a) **climate change mitigation**, b) **climate change adaptation**, c) a **regenerative circular economy**, d) **zero pollution and a toxic-free environment**, e) **biodiversity and ecosystems** and f) **environmental and climate pressures related to EU production and consumption.**

More specifically, it stipulates that: 'The 8th EAP shall have the following six interlinked thematic priority objectives for the period up to 31 December 2030:

(a) swift and predictable reduction of greenhouse gas emissions and, at the same time, enhancement of removals by natural sinks in the Union to attain the 2030 greenhouse gas emission reduction target as laid down in Regulation (EU) 2021/1119, in line with the Union's climate and environment objectives, whilst ensuring a just transition that leaves no one behind;

(b) continuous progress in enhancing and mainstreaming adaptive capacity, including on the basis of ecosystem approaches, strengthening resilience and adaptation and reducing the vulnerability of the environment, society and all sectors of the economy to climate change, while improving prevention of, and preparedness for, weather- and climate-related disasters;

(c) advancing towards a wellbeing economy that gives back to the planet more than it takes and accelerating the transition to a non-toxic circular economy, where growth is regenerative, resources are used efficiently and sustainably, and the waste hierarchy is applied;

(d) pursuing zero pollution, including in relation to harmful chemicals, in order to achieve a toxic-free environment, including for air, water and soil, as well as in relation to light and noise pollution, and protecting the health and wellbeing of people, animals and ecosystems from environment-related risks and negative impacts;

(e) protecting, preserving and restoring marine and terrestrial biodiversity and the biodiversity of inland waters inside and outside protected areas by, inter alia, halting and reversing biodiversity loss and improving the state of ecosystems and their functions and the services they provide, and by improving the state of the environment, in particular air, water and soil, as well as by combating desertification and soil degradation;

(f) promoting environmental aspects of sustainability and significantly reducing key environmental and climate pressures related to the Union's production and consumption, in particular in the areas of energy, industry, buildings and infrastructure, mobility, tourism, international trade and the food system.'

- **8th EAP enabling conditions**

Article 3 of the 8th EAP identifies the enabling conditions necessary to attain the 8th EAP priority objectives. These conditions address mainly issues of environment and climate policy implementation, funding, financing and integration into other policies.

Article 3 requests that the conditions are put in place 'to ensure that social inequalities resulting from climate- and environmental-related impacts and policies are minimised'.

It requires the 'strengthening of environmentally positive incentives as well as phasing out environmentally harmful subsidies, in particular fossil fuel subsidies without delay'.

Finally, it requires 'strengthening of the environmental knowledge base' and 'developing and consolidating the knowledge base, inter alia, on the requirements for systemic change'.

Article 3 includes many more enabling conditions. The conditions above are the most relevant from the perspective of the 8th EAP monitoring framework ([2]) and the indicators that were selected by the European Commission for the annual 8th EAP monitoring.

- **8th EAP monitoring framework and governance**

Article 4 establishes a monitoring framework to measure the progress of the Union and its Member States towards the attainment of the priority objectives of the 8th EAP and a governance mechanism to ensure attainment of those priority objectives.

Article 4(1) provides the overall aim of the 8th EAP monitoring: 'The **Commission**, supported by the European Environment Agency (EEA) and the European Chemicals Agency (ECHA), without prejudice to their independence, **shall monitor**, assess and report **on the progress of the Union and the Member States with regard to attaining the priority objectives set out in Article 2, on an annual basis, taking into consideration the enabling conditions laid down in Article 3 and the overall goal of achieving systemic change.** The information that results from that monitoring, assessment and reporting shall be made publicly available and easily accessible.'

Articles 4(2) and 4(3) detail further the aim of the 8th EAP monitoring and its ingredients:

'The monitoring, assessment and reporting referred to in paragraph 1 shall aim to **facilitate high-level strategic political communication.** Following a consultation process with all relevant stakeholders, the **Commission shall, by 2 May 2022, present a monitoring framework, based on a limited number of headline indicators, which include, where available, systemic indicators** that address, inter alia,

environmental-social and environmental-economic nexus. The list of **headline indicators shall remain stable** to ensure accountability. …' (Article 4(2)).

'The monitoring and assessment referred to in paragraph 1 … shall be based on a methodology that enables, where possible, measurement of distance to targets in relation to the priority objectives set out in Article 2 and selected headline indicators.' (Article 4(3)).

Article 4(4) outlines the annual governance of the 8th EAP monitoring: 'The **European Parliament**, the **Council** and the **Commission shall take account of, and exchange views annually on, the assessment referred to in paragraph 1 as well as actions taken and possible future actions.**'

Article 4(5) outlines the tasks that the EEA and the ECHA shall perform in order to support the Commission to improve the availability and relevance of data, indicators and knowledge.

Upon adoption of the 8th EAP Decision, the EEA and the European Commission agreed that the EEA, in support to the 8th EAP monitoring, will prepare annual progress reports with regard to attaining the priority objectives while taking into consideration the enabling conditions and the overall goal of achieving systemic change. The EEA will do this annually and on the basis of the 28 8th EAP headline indicators and corresponding targets, which the European Commission outlined in its 8th EAP monitoring framework communication.

- **8th EAP mid-term review**

Article 5 of the 8th EAP Decision details the 8th EAP mid-term review process and potential follow-up.

The European Commission shall carry out the mid-term review of the 8th EAP progress by 31 March 2024. This shall be based on the 8th EAP progress assessments outlined in Article 4(1) and any other relevant findings. Where appropriate, the Commission shall propose changes to the headline indicators referred to in Article 4(2) in light of the outcome of the mid-term review.

'The Commission shall present, where appropriate, a legislative proposal to add an annex to the 8th EAP, for the period after 2025, containing a list of actions with a view to reaching' the 8th EAP thematic priority objectives, as well as a timeline for the respective actions.

- **8th EAP evaluation**

Article 6 of the 8th EAP stipulates that 'by 31 March 2029, the Commission shall carry out an evaluation of the 8th EAP followed, if appropriate, by a legislative proposal for the next environmental action programme by 31 December 2029'.

Annex 2 EEA methodology to assess the outlook of meeting the 2030 targets of the 8th EAP monitoring communication of the European Commission

The methodology is specific to the 8th EAP headline indicators and the corresponding 2030 8th EAP targets, which were published in the 8th EAP monitoring framework communication ([3]) of the European Commission. It does not assess progress towards the priority objectives as such of the 8th EAP Decision ([4]).

This methodology addresses only how to assess the outlook of meeting the 8th EAP monitoring targets by 2030 and not how to assess the past trends of the 8th EAP headline indicators ([i]).

Key principles

1. The assessment is done at the level of each of the 8th EAP headline indicators and of their corresponding 8th EAP monitoring target that should be met by 2030 – see list of indicators and targets in pages 5-8 of the 8th EAP monitoring framework communication.

2. The methodology assumes correlation between the trend of the indicator with the prospects of meeting the corresponding target.

3. The methodology can assess progress towards both quantitative and qualitative objectives. 70% of the targets in the 8th EAP monitoring framework communication are qualitative.

4. The methodology allows a choice of methods to reflect the best available evidence as well as combining methods.

Outlook assessment methodology

5. In general, the assessment of the outlook of meeting one of the 28 8th EAP targets outlined in the 8th EAP monitoring framework communication by 2030 is based on some combination of:

- **Modelled estimates of future developments (if available).** This method takes precedence over any other method if the projections are officially reported (e.g. legally binding official national projections) and reflect the current policy landscape, and the scope and timeframe accurately match those of the indicator.

([i]) For the assessment of past trends, the method used was ordinary least squares regression with testing of the slope. The full time series was used for each of the indicators. The direction of the past trend was estimated depending on the slope being significantly different from zero, in either positive or negative direction. Significance was determined according to the 95% confidence interval of the regression slope (interval covering zero or not), provided that the P-value of the regression was below 0.05 for accuracy. The results were compared with the results of other assessment methods (percentage change and compound annual growth rate) and were found to be consistent with the assessment done by the EEA indicator experts. The statistical methods used are all established methods for trend assessment of indicators. For more information on such methods, please consult the 2014 publication by Eurostat Getting messages across using indicators.

Often these conditions are not fully met, in which case such information is not used alone but combined with other methods.

- **Indicator-based trends observed over the previous years.** Indicator past trends do not reflect the current and foreseeable economic and policy context; they only reflect the past context. This method is therefore usually used in combination with other methods. As we move closer to 2030 (i.e. in future 8th EAP monitoring reports) the more this method will weigh in since significant changes in the context will be less likely.

- **'Distance to target' assessments (if available).** If a required path is already included in a directive, as in the old renewable energy directive (which prescribed the expected biannual increase of the share of renewable energy sources in gross energy consumption), the distance from that path at a given year determines the assessment of the prospects. It is unclear if any upcoming legislation will prescribe such pathways. More generally, if there is a quantitative target, the comparison of the annual observed growth rate of the latest 10 years (e.g. 2011-2021) and of the required annual growth rate of the remaining years (e.g. 2021-2030) to achieve the target by 2030 will inform the assessment alone or in combination with other relevant information.

- **Expert consideration of available knowledge, information and methods.** Expert consideration is used to:

    - determine the method or combination of methods, if in doubt;

    - determine the strength of evidence;

    - use additional evidence and information, for instance from studies, impact assessments, national plans and programmes, modelling, results from other relevant monitoring mechanisms (such as zero pollution, circular economy, climate and energy, biodiversity) and interpret this in context of the assessment's scope and timeframe;

    - take into account EU policy developments and, if appropriate, the geopolitical and socio-economic context. The methodology errs on the side of caution when it comes to such considerations. For instance, only EU policy developments that reached adoption and for which there is evidence of an expected outcome by 2030 are usually taken into account.

6. Each indicator assessment is quality assured through a **consultation process**. The process is specific to each indicator and involves in all cases the following experts and networks:

- **EEA experts** – several EEA experts review the assessment.

- **Eionet** – each indicator is reviewed by the relevant Eionet group(s).

- **European Commission and EU agencies** – each indicator is reviewed by the relevant European Commission services and EU agencies.

Assessment result

7. On the basis of points 1-6 above, the EEA assesses the outlook of meeting the 28 8th EAP targets published in the 8th EAP monitoring framework communication by 2030, by assigning the outlook to one of the following five classes:

If it is very likely that the objective will be met	i.e. it answers 'yes' with a high degree of confidence to the question: Is the target on track to be met by 2030?
If it is likely but uncertain	i.e. it answers 'maybe yes' to that question
If it is unlikely but uncertain	i.e. it answers 'maybe no'
If it is very unlikely	i.e. it answers 'no' with a high degree of confidence
If it is unclear	i.e. the prospects cannot be determined (e.g. insufficient data/evidence, no correlation between indicator and selected objective)

Assigning dark green or dark red means there is high degree of certainty over the expected outcome by 2030, i.e. a different outcome would be considered surprising. It requires robust, well-established evidence, preferably numerical, and/or consensus to substantiate the assessment outcome. Examples of such robust evidence include official projections (e.g. legally binding national projections) and results of well-accepted studies that can be interpreted in context of the indicator's scope and timeframe.

Assigning light green or orange indicates that the balance of evidence points to a certain direction but with some uncertainty. The methodology errs on the side of caution — i.e. if the level of confidence in the outcome is not very high, light colours are assigned.

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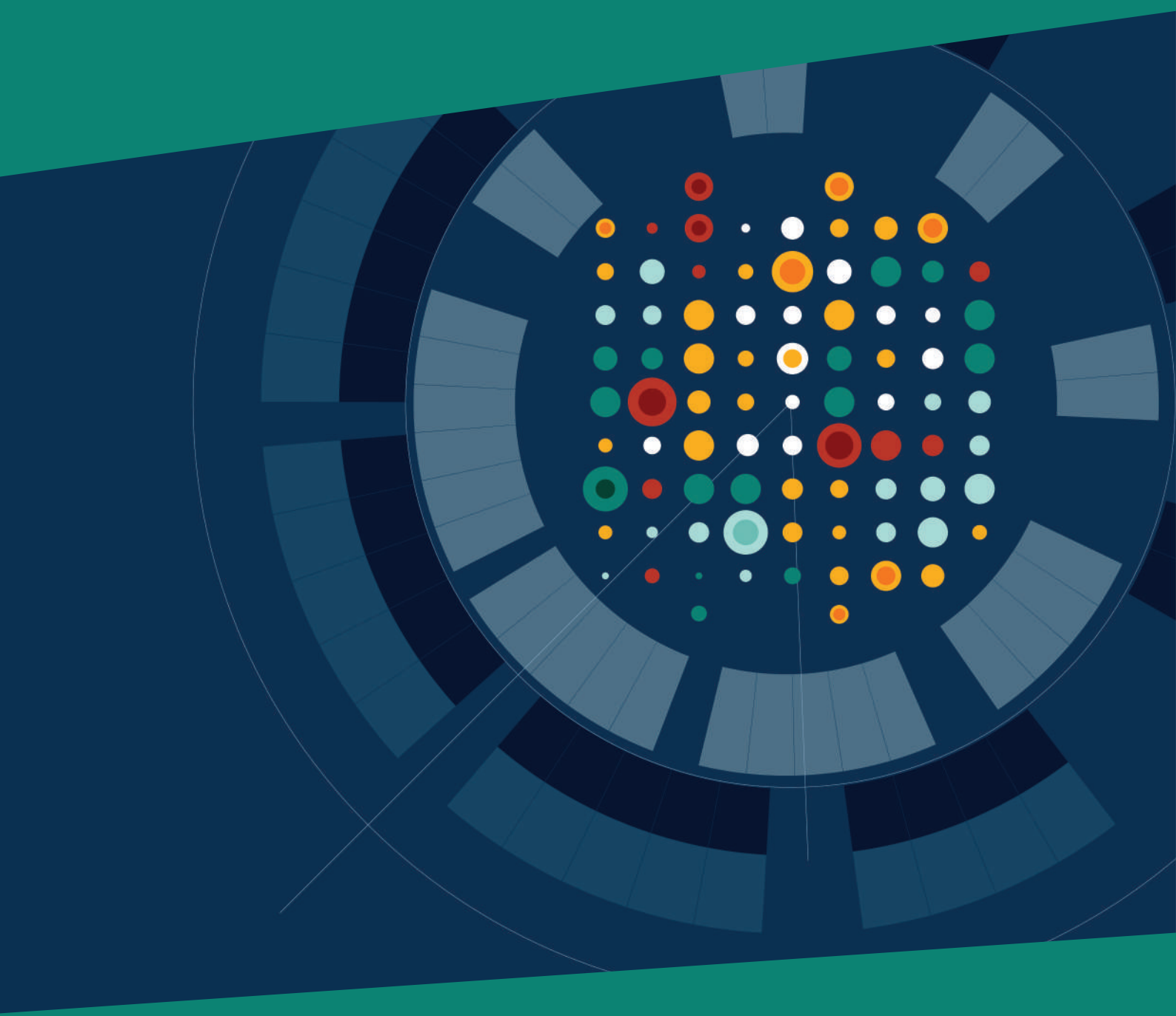

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