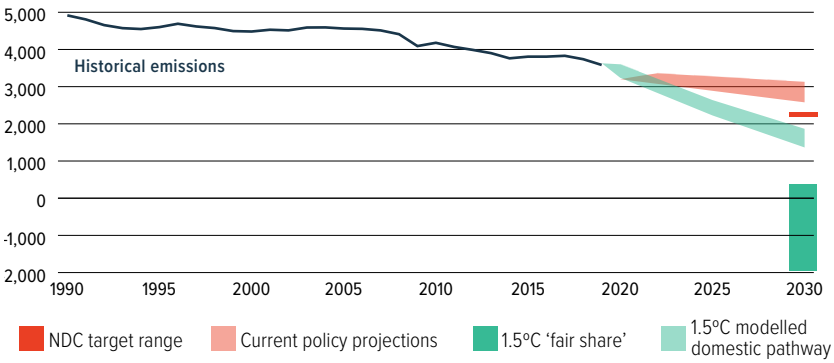
EUROPEAN UNION

Climate Transparency

CLIMATE TRANSPARENCY REPORT: COMPARING G20 CLIMATE ACTION **2022**

NOT ON TRACK FOR A 1.5°C WORLD

1.5°C compatible emissions pathway ($MtCO_2e$/year)[1]

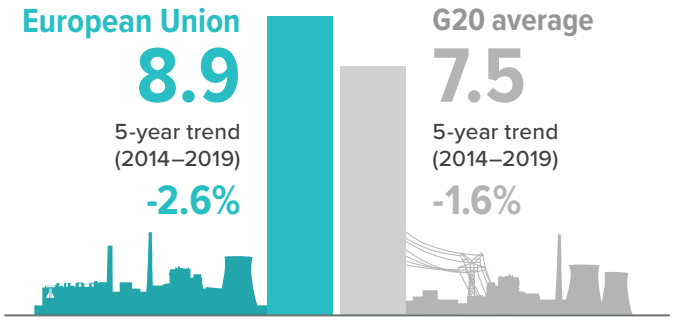


The EU's NDC target would decrease emissions by "at least" 55% below 1990 levels, or to approximately 2,246 $MtCO_2e$ (excl. LULUCF). To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that the EU's emissions would need to be around 1,548 $MtCO_2e$ by 2030, leaving an ambition gap of about 698 $MtCO_2e$. A 1.5°C 'fair share' contribution by the EU requires it to strengthen its domestic target and, in addition, provide substantial support for emissions reductions in developing countries.

Climate Action Tracker, 2022a; 2022b; Climate Analytics, 2022; Gütschow et al., 2021

PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS ABOVE G20 AVERAGE

tCO_2e/capita[2] in 2019



The EU's per capita emissions are 1.2 times the G20 average. Total per capita emissions have decreased by 2.6% from 2014–2019.

Gütschow et al., 2021; World Bank, 2022

RECENT DEVELOPMENTS

The EU's classification of fossil gas and nuclear as "green" under the EU taxonomy undermines not only the credibility of the taxonomy as a framework guiding sustainable investments, but also of the European Green Deal and "Fit for 55" package.

At least 37% of the EUR 750bn NextGenerationEU recovery fund has to be spent on climate action, and many states are implementing such projects in the context of the energy crisis.

However, the EU and some Member States plan to invest in new fossil fuel infrastructure. The REPowerEU Plan itself has earmarked EUR 10bn for new LNG and fossil gas pipeline infrastructure to reduce EU dependency on Russian gas.

KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION

The EU should **update its NDC to reflect the strengthened renewable energy and energy efficiency goals** in the REPowerEU plan of May 2022.

The **energy crisis creates an opportunity to accelerate decarbonisation** of Europe's energy sector by fast-tracking renewables in all sectors and investing in energy efficiency, not only to reduce emissions, but to **decrease the EU's fossil energy dependency**, and facilitate economic growth.

Smart electrification of different sectors would make it easier to better integrate variable sources of energy, especially wind and solar, which will dominate future energy generation in the EU.

Contents

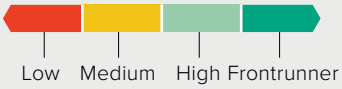
We unpack the EU's progress and highlight key opportunities to enhance climate action across:

Legend

Trends show developments over the past five years for which data are available. A red exclamation mark indicates negative trends from a climate protection perspective.

Decarbonisation Ratings[3] assess a country's performance compared to other G20 Members. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.

Policy Ratings[4] evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



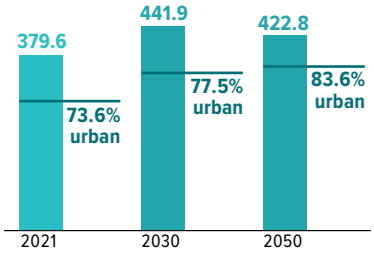
SOCIO-ECONOMIC CONTEXT

Human Development Index

No data available for the EU

Population and urbanisation projections

(in millions)

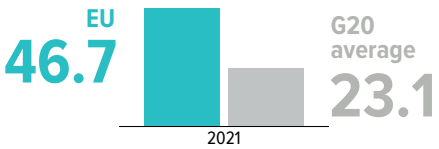


The EU's population is projected to increase by 11% by 2050, and become more urbanised. Temperatures in built-up areas are higher than in rural areas due to the urban heat island effect.

United Nations, 2018; World Bank, 2022

Gross Domestic Product (GDP) per capita

(thousand PPP constant 2015 international $ per person) in 2021



World Bank, 2021

Death rate attributable to ambient air pollution

(death rate per 1,000 population per year, age standardised) in 2019

No data available for the EU

A JUST TRANSITION

The EU's Just Transition Mechanism (JTM) is a key tool to ensure that the transition towards a "climate-neutral" economy happens in a fair way. It provides targeted support to help mobilise around EUR 55bn over the period 2021–2027 in the most affected regions, to alleviate the socio-economic impact of the transition. It focuses on the regions, industries and workers who will face the greatest challenges, through three pillars.

The first pillar is the Just Transition Fund that is expected to mobilise around EUR 25.4bn in investments. It supports the territories most affected by the transition towards climate neutrality to avoid regional inequalities. The second pillar is the InvestEU Just Transition scheme, which provides a budgetary guarantee. It is expected to mobilise EUR 10–15bn in mostly private sector investments. Finally, the third pillar is the new Public Sector Loan Facility that aims to mobilise EUR 18.5bn of public investment.

European Commission, 2018; World Resources Institute, 2020

ADAPTATION

Paris Agreement: Increase the ability to adapt to the adverse effects of climate change and foster climate resilience and low-GHG development.

Official accounts tally almost 90,000 victims from heatwaves in Europe between 2000–2020. The number of hot days and the intensity and frequency of heatwaves is expected to rise under future climate change scenarios.

In the second half of the century, if coastal defences are not upgraded to respond to increasing climate change risk, **expected annual damages to EU coastal infrastructures could reach EUR 776bn.**

In Europe, **increasing mean annual temperatures** in the Baltic, Scandinavia, and Continental Europe **have led to widespread lowering of water tables at intact peatland sites.**

ADAPTATION NEEDS

Impacts of a changing climate

No data available for the EU

Exposure to future impacts at 1.5°C warming and higher

Different levels of global warming are projected to have a wide range of impacts of varying severity across the world. The percentages at 1.5°C are calculated as an increase/decrease from the reference period of 1986–2006. Using the projected impacts at 1.5°C of warming as a reference, we compare impacts that may occur at higher levels of warming.

Climatic	**At 2°C**	**At 2.5°C**	**At 3°C**
Local **precipitation**: +2.4% at 1.5°C warming	0.7 times	0.7 times	0.3 times
Local **snowfall**: -16.2% at 1.5°C warming	1.6 times	1.9 times	2.3 times

In the EU, local precipitation is projected to increase by 2.4% above the reference period of 1986–2006, if global temperature rises by up to 1.5°C. More warming is projected to further increase precipitation: under a 2.5°C warming scenario, it is projected to increase by 0.7 times the increase projected at 1.5C of warming. Local snowfall, however, is expected to decrease under a 1.5°C scenario by 16.2% from the reference period's snowfall. At 3°C of warming, the decrease is expected to be 2.3 times what it would be under a 1.5°C scenario.

Fresh water	**At 2°C**	**At 2.5°C**	**At 3°C**
Surface run-off: -2.5% at 1.5°C warming	1.9 times	2.2 times	3 times
River discharge: -1.1% at 1.5°C warming	4.7 times	5.6 times	8.7 times
Total **soil moisture content:** -1.5% at 1.5°C warming	1.9 times	2.6 times	3.5 times

In the EU, the percentage of surface run-off and total soil moisture is projected to decrease by 2.5% and 1.5%, respectively, if global temperature rises by up to 1.5°C. This loss of surface run-off/moisture content would be 3 and 3.5 times greater (or a decline of approximately 7.5% and 5.3%), respectively, at 3°C of warming. Under 1.5°C of warming, river discharge would decrease by 1.1%. This decline would be 8.7 times greater under a 3°C warming scenario.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to **heatwaves:** 143,420 at 1.5°C warming	2.2 times	3.4 times	7.7 times
Number of people annually exposed to **wildfires:** 115,322 at 1.5°C warming	1.6 times	1.9 times	2.7 times

The number of people annually exposed to hazards is expected to rise as the temperature increases. For example, the number of people annually exposed to heatwaves in the EU is projected to rise by approximately 143,000 above the 1986–2006 reference period, at 1.5°C of warming, and 3.4 times greater if warming increases to 2.5°C. At 1.5°C of warming, wildfires are projected to affect 115,322 more people than were affected between 1986–2006, while at 3°C even that increase in people exposed to wildfires is projected to be multiplied by 1.7 times.

Economic	At 2°C	At 2.5°C	At 3°C
Labour productivity due to heat stress: -0.7% at 1.5°C warming	1.6 times	2.5 times	3.5 times

Labour productivity is projected to decline 0.7% under 1.5°C of warming, and this decrease would be 2.5 times larger at 2.5°C of warming.

For further assessments of impacts under different warming scenarios, and a detailed explanation of the methodology, go to https://climate-impact-explorer.climateanalytics.org

Climate Analytics, 2021

ADAPTATION POLICIES

National Adaptation Strategies

The EU adopted its first Adaptation Strategy in 2013 and evaluated progress in 2018. In February 2021, the European Commission adopted the new EU Strategy on Adaptation to Climate Change.

The Strategy is functionally part of the European Green Deal and part of the implementation of the European Climate Law adopted in June 2021. It calls for action by Member States and all public and private actors to better prepare Europe for the increasing intensity and frequency of climate change impacts. The Strategy outlines four main objectives: smarter and faster adaptation, a more systemic approach to adaptation and increasing international action to promote climate resilience.

Nationally Determined Contribution (NDC): Adaptation

TARGETS

Not mentioned

ACTIONS

Not mentioned

MITIGATION

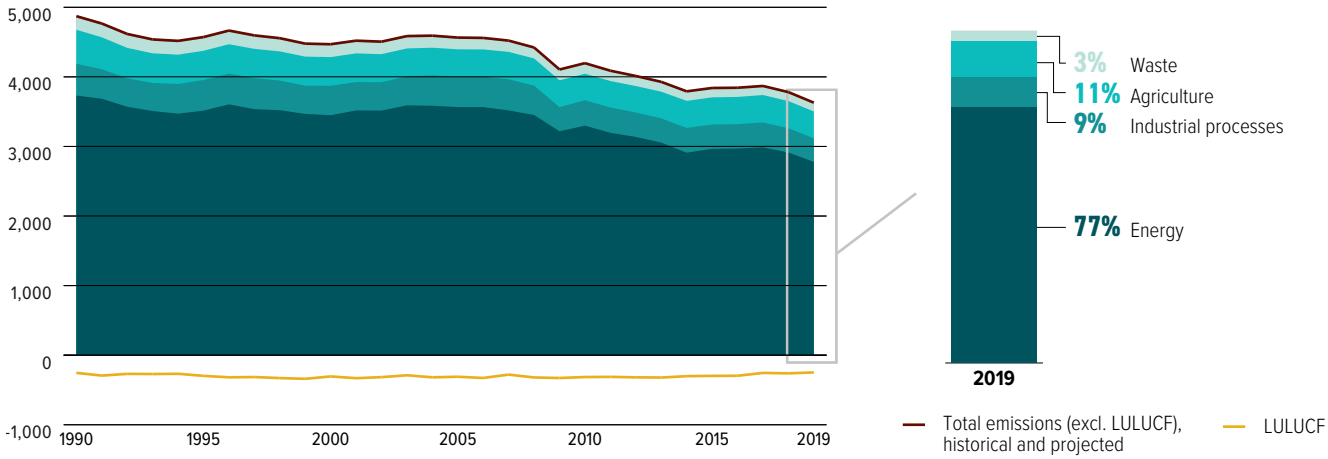
Paris Agreement: Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.

EMISSIONS OVERVIEW

The EU's total greenhouse gas emissions (excl. LULUCF) have decreased by 25.5% (1990–2019). In the same period, its **total methane emissions (excl. LULUCF) have decreased by 35%.**

GHG emissions across sectors[5]

Total sectoral GHG emissions ($MtCO_2e$/year)

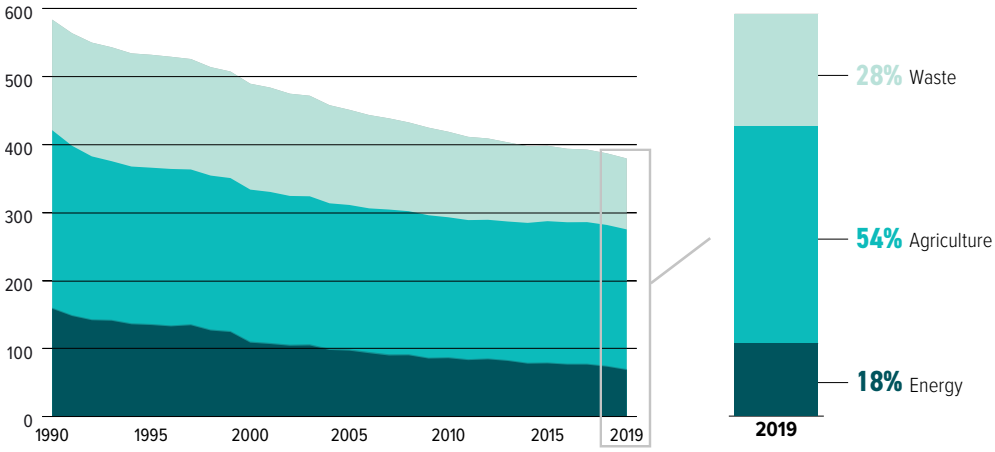


The EU's GHG emissions (excl. LULUCF) decreased by 25.5% between 1990 and 2019 to 3,628 $MtCO_2e$/yr. When considered by category, reductions in energy sector emissions have helped to decrease overall emissions. Emissions from industry and agriculture decreased slower than the total emissions.

Gütschow et al., 2021

Methane emissions by sector

Total CH_4 emissions ($MtCO_2e$/year)



The EU signed the Global Methane Pledge at COP26 in November 2021.

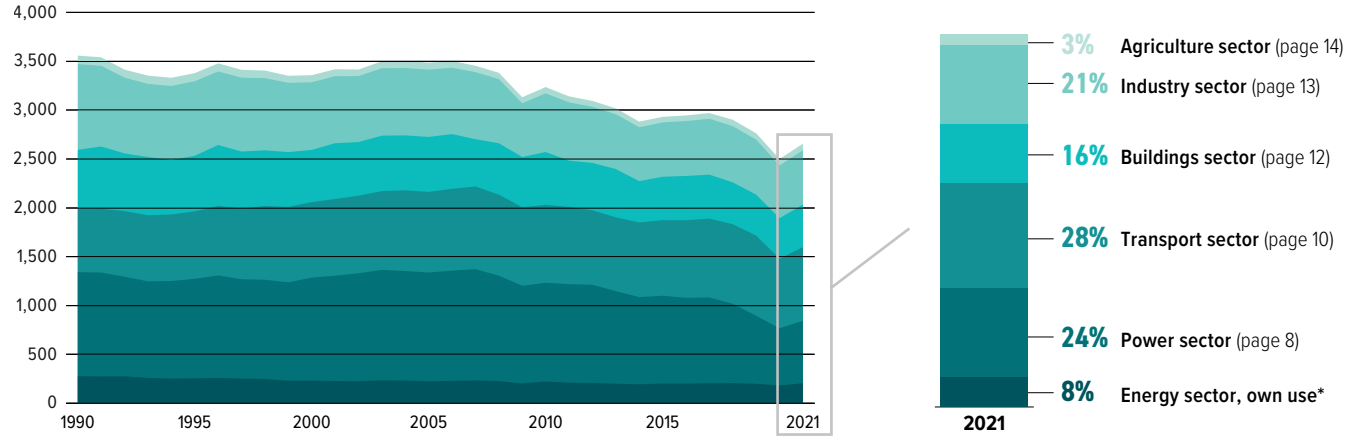
Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

Methane is a potent, though short-lived, greenhouse gas, accounting for an estimated third of global warming. The EU's methane emissions (excl. LULUCF) decreased by 35% between 1990–2019 to 379 $MtCO_2e$/yr. The majority of the EU's methane emissions came from the agriculture sector in 2019, as in 1990. Emissions in the energy sector have halved since 1990, a decline due to a combination of measures such as the reduction of flaring, venting, as well as changes in the composition of the energy mix.

Climate and Clean Air Coalition, 2021; Gütschow et al., 2021

Energy-related CO_2 emissions by sector

Annual CO_2 emissions ($MtCO_2$/year)

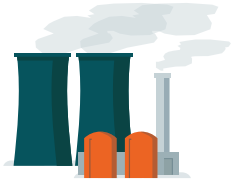


The largest driver of overall greenhouse gas emissions are CO_2 emissions from fuel combustion. In the EU, emissions have been decreasing since 2005. In 2021, the transport sector was the largest contributer at 28%, followed by the power and industry sectors, with 24% and 21%, respectively.

Enerdata, 2022

**Includes energy-related CO_2 emissions from extracting and processing fossil fuels.*

ENERGY OVERVIEW



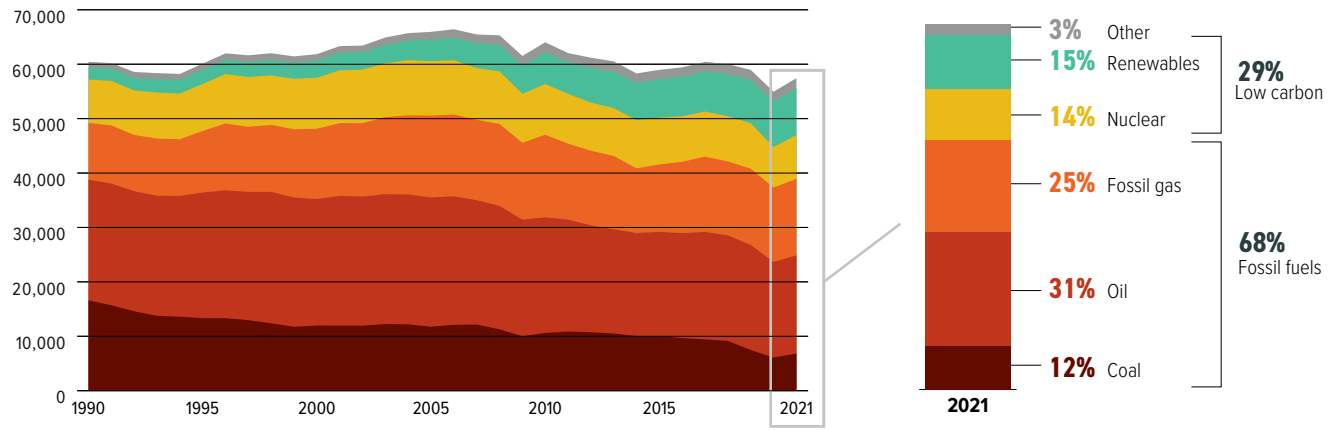
In 2021, fossil fuels made up approximately 68% of the EU's energy mix, lower than the G20 average of 81%. **Renewables accounted for 15%, a higher share than the G20 average (11%).** The carbon intensity of the energy mix has decreased from approximately 60 tCO_2/TJ in 1990 to 46 tCO_2/TJ in 2021.

The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050, and to substantially lower levels without carbon capture and storage.

Rogelj et al., 2018

Energy mix

Total primary energy supply (PJ)

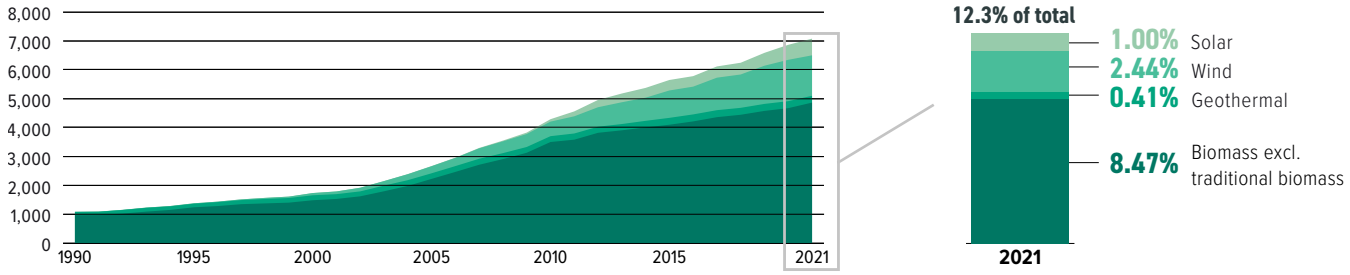


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating and cooking, but also for transport fuels. Fossil fuels make up 68% of the EU energy mix, lower than the G20 average. Since 1990, the share of coal has decreased by almost two-thirds, whereas oil continues to dominate the energy sector, driven by a lack of decisive climate action in the transport sector. The share of renewables has increased slightly over the past two decades, but its uptake has largely been limited to the power sector.

Enerdata, 2022

Solar, wind, geothermal and biomass development

As a share of total primary energy supply (TPES) (PJ)

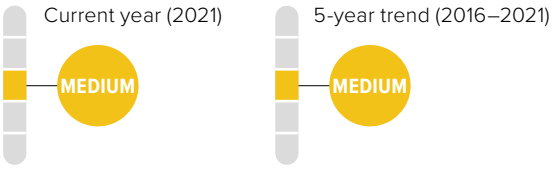


Solar, wind, geothermal and biomass, excluding traditional biomass, account for 12.3% of the EU's energy supply – the G20 average is 7.5%. Their share in total energy supply has increased by around 26.7% between 2016–2021. Biomass (for electricity and heat) makes up the largest share of renewables in primary energy supply.

Enerdata, 2022

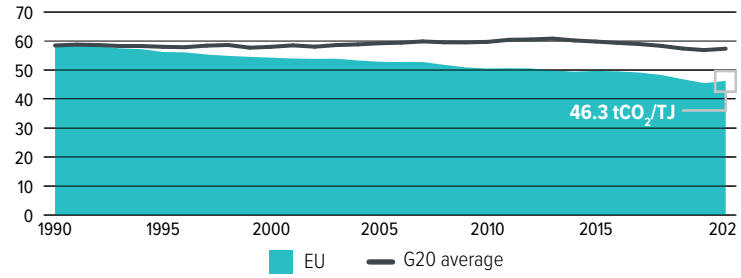
Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.

Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

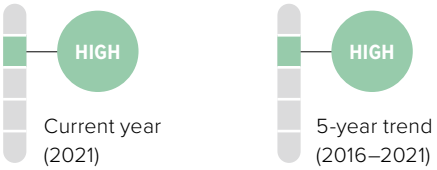


Carbon intensity of the energy sector

Tonnes of CO_2 per unit of TPES (tCO_2/TJ)



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Carbon intensity is a measure of how much CO_2 is emitted per unit of energy supply. In 2021 this was 46.3 tCO_2/TJ for the EU, significantly lower than the G20 average, reflecting the growing share of renewables. In response to the energy crisis, the EU plans a significant increase in solar and wind power to end its reliance on Russian oil and gas as fast as possible, and a temporary uptake in the use of coal.

Enerdata, 2022

Energy supply per capita

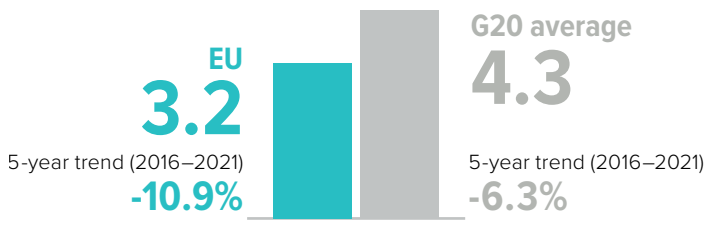
TPES per capita (GJ/capita) in 2021

The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy. In 2021, energy supply per capita in the EU was 151.3 GJ, well above the G20 average of 99.4 GJ. However, energy supply has decreased between 2016 and 2021 by 6.6% while the G20 average has increased by 1.6% over the same period.

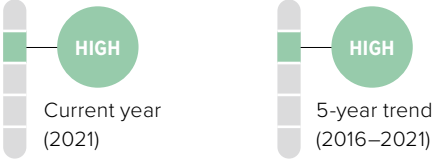
Enerdata, 2022; World Bank, 2022

Energy intensity of the economy

(TJ/million US$2015 GDP) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of decarbonisation, efficiency achievements, climatic conditions or geography. The EU's energy intensity of the GDP is lower than the G20 average, and between 2016–2021 has been decreasing at 10.9%, much faster than the G20 average decrease of 6.3% annually.

Enerdata, 2022; World Bank, 2021

POWER SECTOR

Emissions from energy used to make electricity and heat

Renewables generated 39% of Europe's electricity in 2021, overtaking fossil fuel generation at 36%. This is an important milestone in Europe's clean energy transition. The remaining electricity was generated by nuclear power.

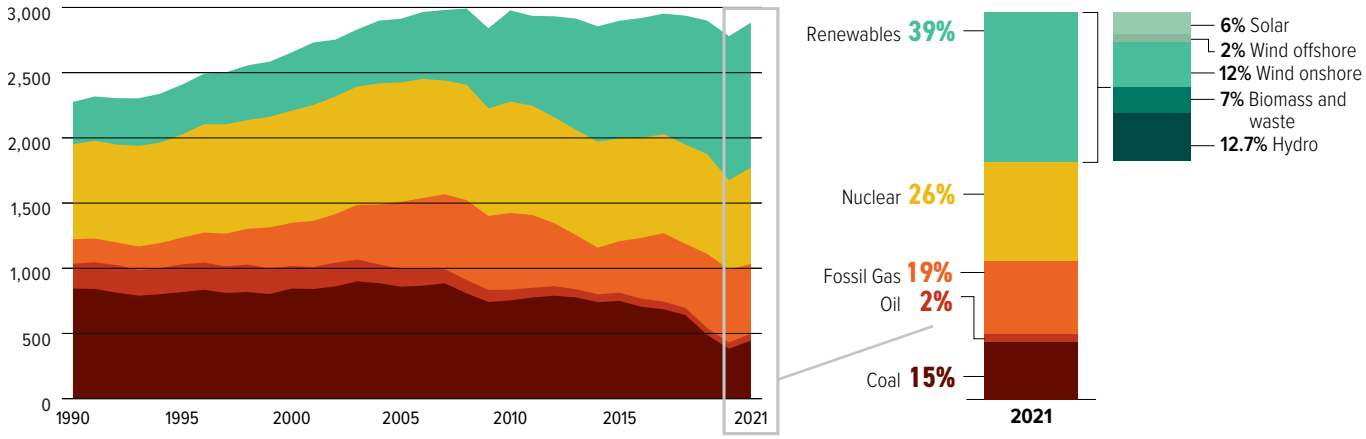
Power generation's share of energy-related CO_2 emissions in 2021: **24%** Direct

Worldwide, coal use for power generation needs to peak by 2020, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced to zero.

Climate Action Tracker, 2020; Rogelj et al., 2018

Electricity generation mix

Gross power generation (TWh)

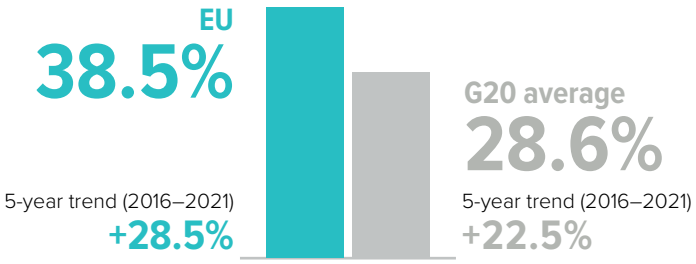


The EU generated 36% of its electricity from fossil fuels in 2021, with coal and oil falling to 15.4% and 1.8%, respectively. The share of fossil gas kept increasing, generating 18.5% of electricity. Exploding fossil gas prices, driven by the halt of Russian gas supplies to many Member States, will see a significant change in the future electricity mix. The share of renewable energy in the EU's power sector has increased to approximately 39% of the power mix in 2021.

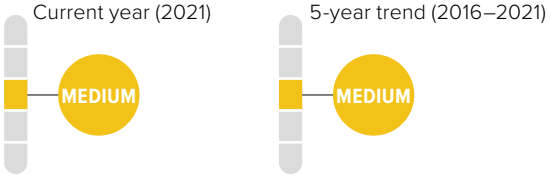
Enerdata, 2022

Share of renewables in power generation

(incl. large hydro) in 2021



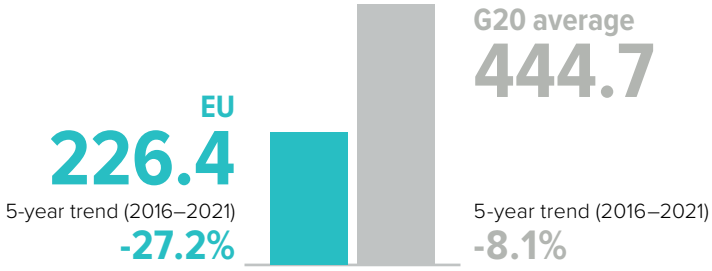
Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



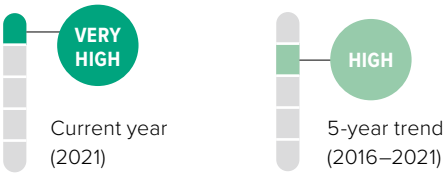
Enerdata, 2022

Emissions intensity of the power sector

(gCO_2/kWh) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



For each kilowatt hour of electricity, 226.4 g of CO_2 were emitted in the EU in 2021. Emissions intensity is decreasing due to the rise of renewables (about 39%) in the power mix, and some Member States are phasing out coal. The temporary switch from gas to coal may slow the decrease of emissions intensity, but due to the cap on emissions from the electricity and industry sectors in the EU Emissions Trading Scheme (ETS), this effect might be delayed until 2030.

Enerdata, 2022

POLICY ASSESSMENT

Renewable energy in the power sector

The RE Directive and the EU ETS provide a policy framework for the development of renewables in the EU.

EU Member States may benefit from EU funding by requesting support from the Recovery and Resilience Facility. In response to the energy crisis brought about as a result of Russia's invasion of Ukraine, the EU's REPower and EU Solar Strategy have begun to scale up the deployment of renewables.

Amendments to the RE Directive aimed at increasing the renewables share from 32% to 45% by 2030 are still going through the approval process.

European Commission, 2022a, 2022b; The Guardian, 2022

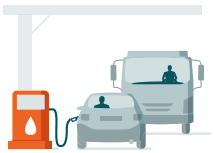
Coal phase-out in the power sector

The EU's emission reduction target of 55% by 2030 requires a complete coal phase-out in the power system by 2030. Eighteen EU countries have set a date, and four (Belgium, Austria, Sweden, and Portugal) have already phased out coal power. Sixteen EU Member States will be coal free by 2025. Phasing out Russian gas may temporarily extend coal-fired power plants. Instead of replacing Russian gas with renewables, the EU has decided to replace gas with gas, by changing suppliers from Russia to the USA, Qatar and Azerbaijan. The European Commission estimates that new LNG terminals and upgraded oil plants will cost EUR 12bn; costs incurred so Member States can move away from their dependence on Russian fossil fuels.

Agora, 2021; Climate Action Tracker, 2022; The Guardian, 2022

TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Transport is responsible for over a quarter of the EU's GHG emissions in 2021. Road transport emissions increased by 24% between 1990–2019, but fell by 13% in 2020, driven by the pandemic-related recession and lockdowns. The lifting of many COVID-related restrictions resulted in a sharp rebound of energy consumption in this sector in 2021. While high fossil fuel prices and current policies are projected to reverse this trend, it remains to be seen whether this will be enough to reduce emissions.

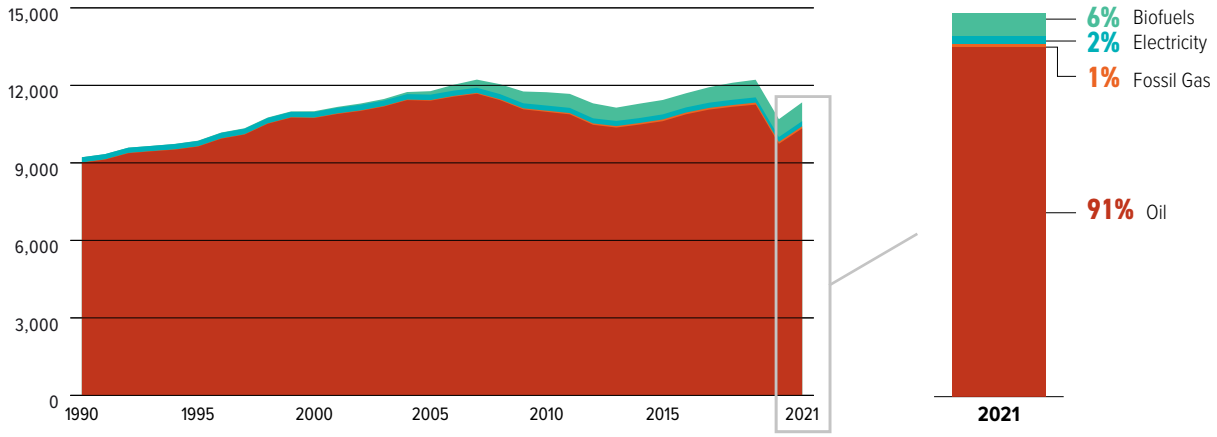
The share of low-carbon fuels in the transport fuel mix must increase to between 40% and 60% by 2040 and 70% to 95% by 2050.

Climate Action Tracker, 2020; Rogelj et al., 2018

Transport's share of energy-related CO_2 emissions in 2021: **28.4%** Direct **0.5%** Indirect

Transport energy mix

Final energy consumption by source (PJ/year)

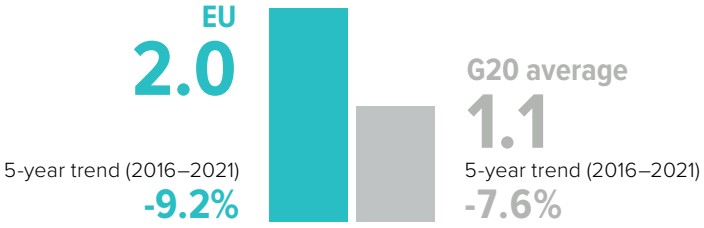


Electricity and biofuels make up only 8% of the energy mix in transport.

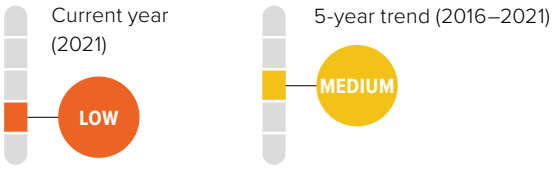
Enerdata, 2022

Transport emissions per capita

(excl. aviation) (tCO_2/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

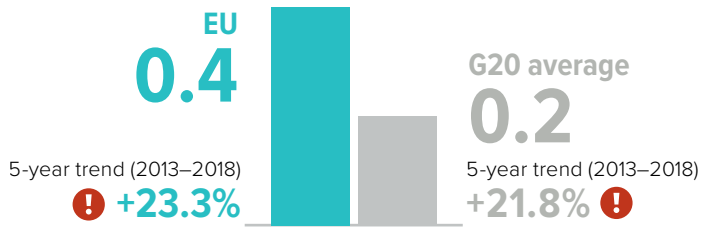


Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at www.climate-transparency.org.

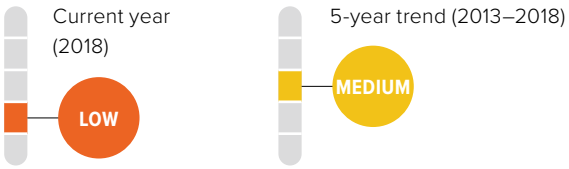
Enerdata, 2022; World Bank, 2022

Aviation emissions per capita[6]

(tCO_2/capita) in 2018

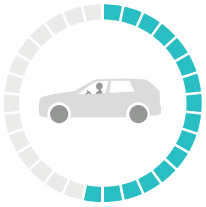


Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Enerdata, 2022; IEA, 2021a; World Bank, 2022

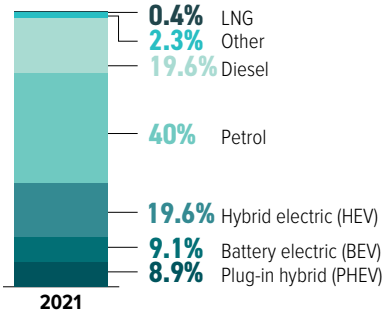
Motorisation rate



532
vehicles per 1,000 inhabitants in 2019

Enerdata, 2022

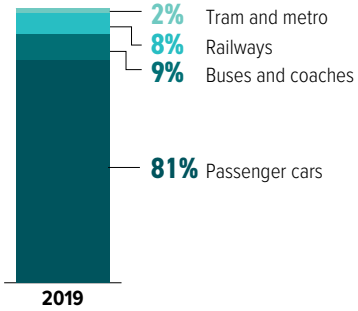
Market share of electric vehicles in new car sales (%)*



ACEA, 2022

Modal split passenger transport*

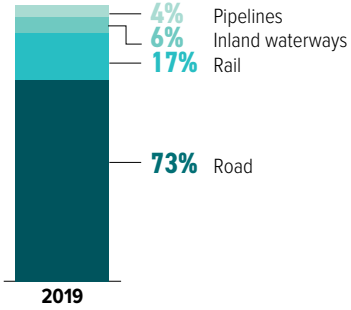
(% of passenger-trips): road, rail and air



European Commission, 2021c

Modal split freight transport*

(modal split in % of tonne-km)



European Commission, 2021c

*These data are not necessarily comparable with data from other G20 Members

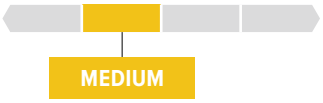
POLICY ASSESSMENT

Phase out fossil fuel cars

In its "Fit for 55" package, the European Commission proposed revising CO_2 standards for cars and vans, resulting in a fleet-wide EU CO_2 reduction target of 55% for new cars and 50% for new vans. From 2035, the proposed target is 0 g/km: a de facto phase-out of the combustion engine. However, there are barriers that will slow the transition to electric vehicles (EVs): the subsidies for the purchase of new EVs also finance the purchase of plug-in EVs, which rarely use the option of driving electrically. In addition, availability of, and payment systems for, charging stations varies widely across the EU.

European Commission, 2021d; European Environment Agency, 2021

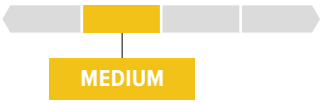
Phase out fossil fuel heavy-duty vehicles



In 2019, the EU adopted its first CO_2 emissions standards for heavy duty vehicles. This covers large trucks, which account for 65–70% of all CO_2 emissions from HDVs. The regulation sets EU-wide targets for reducing the average CO_2 emissions from new trucks: from 2025, a reduction of 15% compared with the reference period (1 July 2019 to 30 June 2020); and from 2030 onwards, a 30% reduction compared with the same reference period. The electrification rate of new HDVs is increasing but is still well behind passenger cars. A dense network of fast-charging infrastructure is needed to allow charging, on average, every 4.5 hours, in line with EU regulations on mandatory rests for drivers.

European Commission, 2021e; European Environment Agency, 2021

Modal shift in (ground) transport

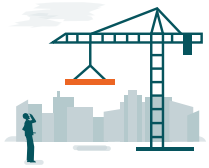


The Sustainable and Smart Mobility Strategy (2020) contains the following targets: doubling of high-speed rail traffic by 2030 and tripling by 2050 (compared with 2015); doubling of rail freight traffic by 2050 (compared with 2015); increasing transport by inland waterways and short sea shipping of 25% by 2030 and of 50% by 2050 (compared with 2015). In their National Recovery Plans, most Member States plan to spend substantial resources on developing or modernising railway connections.

European Commission, 2022; European Environment Agency, 2021

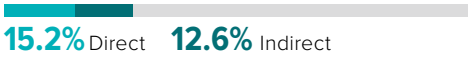
BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct emissions and indirect emissions from the buildings sector in the EU account for 15.2% and 12.6% of total energy-related CO_2 emissions, respectively. Per capita emissions from the buildings sector are 1.4 times the G20 average. The EU's policies are not sufficient for a 1.5°C pathway.

Buildings sector's share of energy-related CO_2 emissions in 2021:

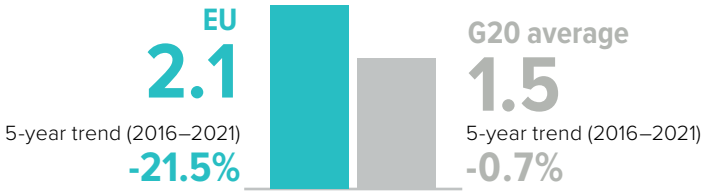


By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95–100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

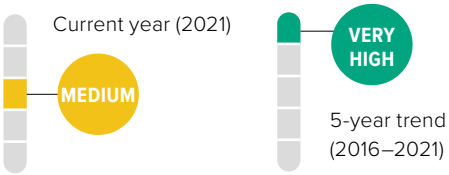
Climate Action Tracker, 2020; Rogelj et al, 2018

Buildings sector emissions per capita

incl. indirect emissions (tCO_2/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Buildings emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (from grid-electricity for air conditioning, appliances, etc.). Buildings-related emissions per capita in 2021 were nearly 1.4 times the G20 average. The majority of these emissions come from fossil gas consumption, which accounted for 32% of the EU final energy consumption in households in 2019, as much as electricity and derived heat combined. In contrast to the G20 average, the EU has decreased the level by 21.5% (2016–2021).

Enerdata, 2022; World Bank, 2022

POLICY ASSESSMENT

Near zero energy new buildings

In December 2021 the European Commission tabled a proposal for the amendment of the Energy Performance of Buildings Directive (EPBD) including a new definition for zero emission buildings, which would mean buildings would need to consume very low amounts of energy, all from renewable sources. If adopted, this new standard will apply to all new public buildings in 2027 and all new private buildings in 2030. There is a proposal to extend the scope of the EU ETS to include the buildings and transport sector, from 2025, which could reduce emissions from these two sectors by 43% below 2030.

European Commission, 2022d, 2022e

Renovation of existing buildings

In October 2020 the Commission launched its "Renovation Wave", a plan with measures to reduce emissions and energy consumption in the buildings sector. The plan aims to double the rate of renovations to at least 35 million buildings by 2030. The REPowerEU Plan 2022 includes further amendments: from 2028, all existing buildings should have solar energy. The EPBD amendment obliges Member States to prepare National Building Renovation Plans every five years, to include renovation targets for 2030, 2040, and 2050. The proposal also obliges Member States to renovate at least 15% of their worst performing public and non-residential buildings by 2027, and residential buildings by 2030.

European Commission, 2022f

INDUSTRY SECTOR

Emissions from energy use in industry

Direct emissions and indirect emissions from industry in the EU make up 21% and 8.7% of energy-related CO_2 emissions, respectively. In May 2021, the European Commission updated its Industrial Strategy, which focuses on supporting sectors of industry most affected by the transition to a low-carbon economy and strengthening EU's digital economy as a tool to reduce emissions.

Industrial emissions need to be reduced by 65–90% from 2010 levels by 2050.

Rogelj et al., 2018

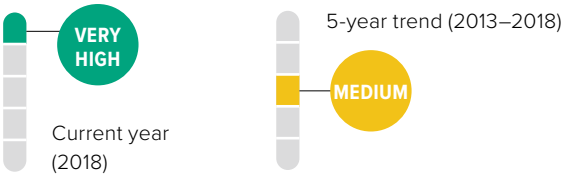
Industry sector's share of energy-related CO_2 emissions in 2021:

21% Direct **8.7%** Indirect

Industry emissions intensity[7]

($kgCO_2e$/USD2015 GVA) in 2018

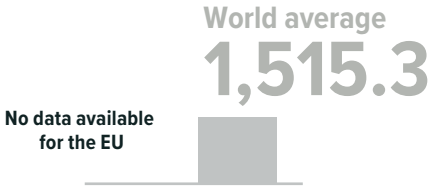
Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Enerdata, 2021; World Bank, 2022

Carbon intensity of steel production[8]

($kgCO_2$/tonne product) in 2019



Steel production and steelmaking are significant GHG emissions sources, and challenging to decarbonise.

Enerdata, 2022; World Steel Association, 2021

POLICY ASSESSMENT

Energy efficiency

The working group on energy efficiency in industry aims to help energy-intensive industries become less energy, resource, and emissions intensive. In 2021, the group revised its implementation plan to align with recent research and innovation developments and policy changes. The new targets cover the years up to 2025, 2030 and 2050. Each sub-sector (cement, chemicals, iron and steel, and pulp and paper) is expected to present its sectoral targets. The cement industry aims to become carbon-neutral by 2050, while the iron and steel sector plans to reduce its total CO_2 emissions from EU steel by 30% by 2030 below 2018 levels.

European Commission, 2021a, 2022c

LAND USE SECTOR

Emissions from land use change and forestry

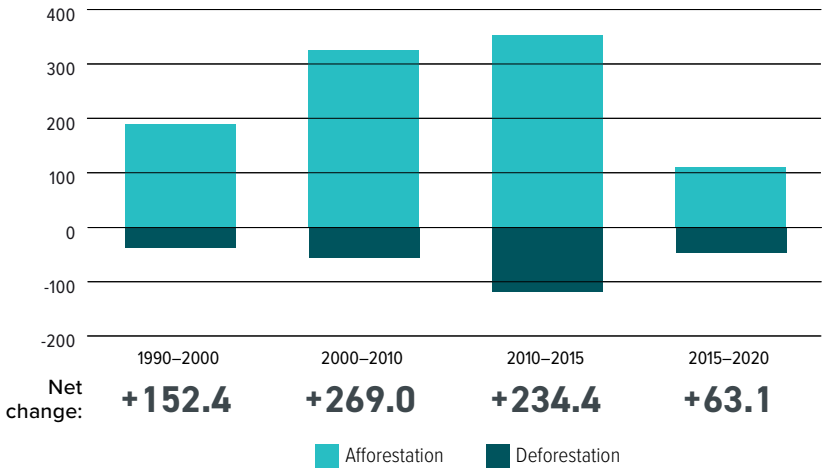
To stay within the 1.5°C limit, the EU needs to make the land use and forestry sector a net sink of emissions, e.g., by halting the expansion of residential areas, discontinuing the degradation of peatlands and use of moor soils, converting cropland into wetlands, and by creating new forests.

Global deforestation needs to be halted and changed to net CO_2 removals by around 2030.

Rogelj et al., 2018

Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year



Between 2015–2020, the EU gained 63.13 kha of forest area per year on average. During the last two decades, the total area affected by fire was approximately 13.2 mha with 1.2 million fires.

Global Forest Assessment, 2020

POLICY ASSESSMENT

Target for net zero deforestation

The New EU Forest strategy for 2030 aims at contributing to the EU's biodiversity objectives of increasing the sink to 310 $MtCO_2e$ annually between 2026–2030. It aims to protect and restore the EU's forests by planting 3 billion trees by 2030. In November 2021, the European Commission adopted a new regulation to halt deforestation and forest degradation caused by the EU. The proposed new rules would ensure that products bought, used and consumed by citizens in the EU market do not contribute to deforestation and forest degradation worldwide.

European Commission, 2022h, 2022i

AGRICULTURE SECTOR

Emissions from agriculture

The EU's agricultural emissions are primarily from the digestive processes and manure of livestock (mainly cattle). A 1.5°C compatible pathway requires behavioural and dietary shifts and less fertiliser use.

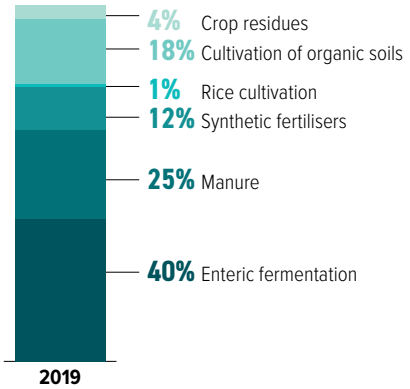
Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Rogelj et al., 2018

Emissions from agriculture

excluding energy emissions, in 2019

390.7
$MtCO_2e$ in 2019



In the EU, the largest sources of GHG emissions in the agriculture sector are enteric fermentation (40%) and livestock manure (25%). Changing the diets of livestock; improving manure storage and handling; reducing or more efficiently using synthetic fertilisers, and making dietary changes in favour of vegetables and fruit could all help reduce emissions from this sector.

Under the Commission's July 2021 proposal, as from 2031, the category of non-CO_2 agricultural emissions will be combined with that of the LULUCF sector, creating a land-use sector where emissions and sinks should balance each other out by, latest, 2035.

FAO, 2022

MITIGATION: TARGETS AND AMBITION

The science from the IPCC on the risks of exceeding 1.5°C warming is clear. The UN science body has projected that to keep the 1.5°C goal alive, the world needs to roughly halve emissions by 2030.

However, despite the Glasgow Climate Pact (1/CMA.3) agreement to "revisit and strengthen" 2030 targets this year, progress on more ambitious targets has stalled. Without far more ambitious government action, the world is heading to a warming of **2.4°C with the current 2030 targets** and even higher warming **of 2.7°C with current policies**.

Climate Action Tracker, 2021a, 2022c; IPCC, 2022; UNFCCC, 2021

AMBITION: 2030 TARGETS

Nationally Determined Contribution: Mitigation

TARGETS

Reducing emissions by "at least" 55%, including a maximum of 225 $MtCO_2e$ carbon sink from LULUCF.

ACTIONS

European Green Deal and Fit for 55 package of measures aim to strengthen existing policies to align with the new goal.

Climate Action Tracker (CAT) evaluation of targets and actions

Critically insufficient	Highly insufficient	**Insufficient**	Almost sufficient	1.5°C Paris Agreement compatible

The CAT evaluates and rates several elements of climate action: policies and actions, targets and a country's contribution to climate finance (where relevant) and combines these into an overall rating.

The CAT rates the EU's climate targets, policies, and finance as "insufficient". The "insufficient" rating indicates that the EU's climate policies and commitments need substantial improvements to be consistent with the Paris Agreement's 1.5°C temperature limit. The EU's 2030 emissions reduction target and its policies and action are consistent with 2°C of warming when compared to modelled domestic pathways. The EU is also not meeting its fair share contributions to climate action.

To improve its rating, the EU should strengthen its emissions reduction target to at least 62% (excl. LULUCF) below 1990 levels, adopt policies necessary to reach this goal, and significantly increase its support for climate action in developing countries.

This CAT analysis was updated in June 2022.
For the full assessment of the country's targets and actions, and the explication of the methodology, see www.climateactiontracker.org

Climate Action Tracker, 2022a

AMBITION: LONG-TERM STRATEGIES

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies. Long-term strategies are an essential component of the transition toward net zero emissions and climate-resilient economies.

Status	Submitted to UNFCCC, last update in 2020
Net zero target	Yes, in 2050
Interim steps	Yes: at least -55% by 2030
Sectoral targets	No

FINANCE

Paris Agreement: Make finance flows consistent with a pathway towards low-GHG emissions and climate-resilient development.

Instead of focusing on reducing fossil gas demand with energy efficiency measures and the development of renewables, **some EU Member States are planning to replace dependency on Russian fossil gas imports with imports from other countries**. Such investments could be made easier due to the classification of energy generation from fossil gas as a transition activity in the EU Taxonomy.

Investment in green energy and infrastructure needs to outweigh fossil fuel investments by 2025.

Rogelj et al., 2018

FISCAL POLICY LEVERS

Fiscal policy levers raise public revenues and direct public resources. Critically, they can shift investment decisions and consumer behaviour towards low-carbon, climate-resilient activities by reflecting externalities in the price.

Fossil fuel subsidies relative to national budgets

No data available for the EU

Fossil fuel subsidies by fuel type

No data available for the EU

No quantified monetary commitments to fossil fuel energy are recorded by the Energy Policy Tracker for the EU for 2021. However, in June 2021, the European Commission proposed extending fossil fuel support unconditionally for Malta and Cyprus until they are connected to the European gas network. Other conditional schemes to decarbonise the gas network using low-carbon gases like biomethane and hydrogen were proposed in December 2020. None of these proposals have been quantified.

Energy Policy Tracker, 2022

Carbon pricing and revenue

In 2005, the EU set up the EU ETS, which entered its fourth phase in 2021. The scheme generated USD 42bn of revenue in 2021. It covers 41% of European emissions, with emissions priced at USD 72/tCO_2e in 2021. The EU ETS covers the power and industry sectors, exempting the aviation sector except for intra-European flights.

European discussions on reforming the carbon market are entering their final trialogue phase, with major reforms at stake: extending the ETS to the maritime sector, dropping exemptions for aviation, abolishing free allowances for industries coupled with the implementation of a carbon border adjustment mechanism, and creating an ETS 2 covering the transport and building sectors.

I4CE, 2022; European Commission, 2022g

FINANCIAL POLICY AND REGULATION

Through policy and regulation, governments can overcome challenges to mobilising green finance, including real and perceived risks, insufficient returns on investment, capacity and information gaps.

The EU has taken considerable steps toward greening its financial system in addition to those taken by Member States. The European Central Bank (ECB) and the European Banking Authority (EBA) completed a climate change stress test of the European economy in September 2021, and launched a complementary supervisory climate change stress test of bank preparedness in January 2022. The EBA issued guidelines on ESG risk management for credit institutions and investment firms in June 2021.

The EU had already implemented mandatory disclosure of climate-related risks for financial institutions under the Sustainable Finance Disclosures Regulation (SFDR) in March 2021, with specific instructions under the EU Taxonomy Regulation laid out in January 2022.

The European Commission has proposed extending the Non-Financial Reporting Directive (NFRD), requiring disclosure of Environmental, Social and Governance (ESG) information by companies, along with further reporting requirements through the Corporate Sustainability Reporting Directive (CSRD). If accepted, this will be implemented in 2024.

The ECB and the European Investment Bank are both members of the Task Force on Nature-Related Financial Disclosures, which plans to issue a framework for disclosing nature-based risks in 2023.

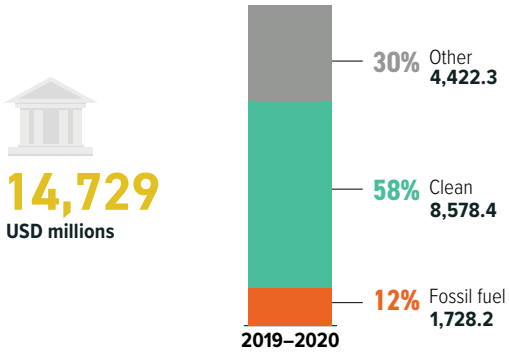
Alogoskoufis et al., 2021; European Banking Authority, 2021; European Central Bank, 2022; European Commission, 2020, 2021b, 2022j; Task Force on Nature-Related Financial Disclosures, 2022

PUBLIC FINANCE

Governments steer investments through their public finance institutions, including via development banks both at home and overseas, and green investment banks. Developed G20 Members also have an obligation to provide finance to developing countries, and public sources are a key aspect of these obligations under the UNFCCC.

Public finance for energy

USD millions (2019–2020 average)



Between 2019 and 2020 the EU – through the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) – provided an average of USD 14.7bn in public finance per year to energy projects. Around 58% of this amount went to renewables while only 12% went to fossil fuels (almost exclusively to fossil gas). The single largest amount of financing was for several renewable energy projects across Spain, mainly solar PV and wind farms. Other significant investments included support for plug-in hybrid EVs in Italy in 2020 for USD 573m, the refurbishment of electricity transmission in Italy in 2019 for USD 542m, and the construction of a lithium battery factory in Poland in 2020 for USD 536m.

Oil Change International, 2022

Provision of international public support

USD millions, annual average 2017 and 2018

Bilateral, regional and other channels:

Annual average contribution **3,156.97**

Multilateral climate finance contributions:

Annual average contribution **3,243.05**

Core/general contributions:

The EU considers its multilateral and bilateral institutions support as climate specific; hence, no core general contribution is recorded as non-climate specific.

The EU is ranked the fourth largest contributor of bilateral climate finance, and the largest for multilateral climate finance, out of the nine G20 Members obligated to provide it. In 2017–2018, it corrected its earlier bias towards mitigation in bilateral climate finance flows, with amounts increasing since the 2015–2016 period. The EU includes the European Investment Bank in its multilateral funding, accounting for an increase in multilateral spending from the 2015–2016 period. The EU still classifies these contributions as climate-specific, rather than a core general contribution to a multilateral institution.

Annex II countries to the UNFCCC, including the EU, are obligated to provide climate finance and have committed to collectively mobilise USD 100bn a year to 2025, when this goal will be renewed, even though the target has never been met and has been criticised as inadequate.

Note: Data on the 'provision of international public support' corresponds to 2017–2018 as per the UNFCCC Fourth Biennial Report (BR). Parties are to submit data by December 2022 for subsequent years in the Fifth BR.

Fair share of the USD 100bn climate finance goal:

A fair share analysis was not undertaken for the EU as it includes Annex II countries that are obliged to provide climate finance as well as Annex I countries that are not.

COP26 Presidency, 2021

Endnotes

For more detail about sources and methodologies, please download the CTR Technical Note at: www.climate-transparency.org/g20-climate-performance/g20report2022

Where referenced, "Enerdata, 2022" refers to data provided in July 2022 and, due to rounding, graphs may sum to slightly above or below 100%.

1 The '1.5°C compatible pathway' is derived from global cost-effective pathways assessed by the IPCC's SR15, selected based on sustainability criteria, and defined by the 5th–50th percentiles of the distributions of such pathways achieving the long-term temperature goal of the Paris Agreement. Negative emissions from the land sector and novel negative emissions technologies are not included in the assessed models, which consider one primary negative emission technology (BECCS). In addition to domestic 1.5°C compatible emissions pathways, the 'fair share' emissions reduction range would almost always require a developed country to provide enough support through climate finance, or other means of implementation, to bring the total emissions reduction contribution of that country down to the required 'fair share' level.

2 'Land use' emissions is used here to refer to land use, land use change and forestry (LULUCF). The Climate Action Tracker (CAT) derives historical LULUCF emissions from the UNFCCC Common Reporting Format (CRF) data tables, converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).

3 The Decarbonisation Ratings assess the current year and average of the most recent 5 years (where available) to take account of the different starting points of different G20 Members.

4 The selection of policies rated and the assessment of 1.5°C compatibility are primarily informed by the Paris Agreement and the IPCC's 2018 SR15. The Policy Assessment Criteria table below (on page 19) displays the criteria used to assess a country's policy performance.

5 In order to maintain comparability across all countries, this report harmonises all data with PRIMAP 2021 dataset to 2018. However, note that CRF data is available for countries which have recently updated GHG inventories.

6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.

7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.

8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

Policy Assessment Criteria

	LOW	MEDIUM	HIGH	FRONTRUNNER
Renewable energy in power sector	No policies to increase the share of renewables	Some policies	Policies and longer-term strategy/ target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
Coal phase-out in power sector	No targets and policies in place for reducing coal	Some policies	Policies + coal phase-out decided	Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)
Phase out fossil fuel cars	No policies for reducing emissions from light-duty vehicles	Some policies (e.g. energy/emissions performance standards or bonus/ malus support)	Policies + national target to phase out fossil fuel light-duty vehicles	Policies + ban on new fossil fuel-based light-duty vehicles by 2035 worldwide
Phase out fossil fuel heavy-duty vehicles	No policies	Some policies (e.g. energy/emissions performance standards or support)	Policies + strategy to reduce absolute emissions from freight transport	Policies + innovation + strategy to phase out emissions from freight transport by 2050
Modal shift in (ground) transport	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies + longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
Near zero energy new buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + national strategy for near zero energy new buildings	Policies + national strategy for all new buildings to be near zero energy by 2020 (OECD countries) or 2025 (non-OECD countries)
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26–50% of industrial energy use	Mandatory energy efficiency policies cover 51–100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75–90% from 2010 levels by 2050
Retrofitting existing buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non-OECD) by 2020
Net zero deforestation	No policies or incentives to reduce deforestation in place	Some policies (e.g. incentives to reduce deforestation or support schemes for afforestation/ reforestation in place)	Policies + national target for reaching net zero deforestation	Policies + national target for reaching zero deforestation by 2020s or for increasing forest coverage

Bibliography

Agora. (2021). *Phasing Out Coal in the EU's Power System by 2030.* https://static.agora-energiewende.de

Alogoskoufis, S. et al. (2021). *ECB Economy-Wide Climate Stress Test.* https://www.ecb.europa.eu

Climate Action Tracker (CAT). (2020). *Paris Agreement Compatible Sectoral Benchmarks Study.* https://climateactiontracker.org

---. (2021a). *Climate Summit Momentum: Paris Commitments Improved Warming Estimate to 2.4C.* https://climateactiontracker.org

---. (2022a). *Climate Action Tracker Country Assessments.* https://climateactiontracker.org/countries/

---. (2022b). *CAT Climate Target Update Tracker.* https://climateactiontracker.org/climate-target-update-tracker/

---. (2022c). *Despite Glasgow Climate Pact 2030 Climate Target Updates Have Stalled.* https://climateactiontracker.org

Climate Analytics. (2021). *Climate Impact Explorer.* http://climate-impact-explorer.climateanalytics.org/

---. (2022). 1.5°C *National Pathways Explorer.* http://1p5ndc-pathways.climateanalytics.org/

Climate and Clean Air Coalition. (2021). *Global Methane Pledge*. https://www.ccacoalition.org/en/resources/global-methane-pledge

COP26 Presidency. (2021). *Compilation of 2021-2025 Climate Finance Commitments.* https://ukcop26.org

Enerdata. (2022). *Global Energy and CO_2 Data.* https://www.enerdata.net/research

Energy Policy Tracker. (2022). *G20 Countries.* https://www.energypolicytracker.org/region/g20

European Automobile Manufacturers' Association (ACEA). (2022). *Fuel Types of New Cars: Market Share Full-Year 2021.* https://www.acea.auto/

Europe Beyond Coal. (2022). *Coal Exit Tracker.* https://beyond-coal.eu/coal-exit-tracker/

European Banking Authority. (2021). *EBA Publishes its Report on Management and Supervision of ESG Risks for Credit Institutions and Investment Firms.* https://www.eba.europa.eu

European Central Bank. (2022). *ECB Launches 2022 Climate Risk Stress Test.* https://www.bankingsupervision.europa.eu

European Commission. (2018). *The Just Transition Mechanism: Making Sure No One is Left Behind.* https://ec.europa.eu

---. (2020). *EU Taxonomy for Sustainable Activities.* https://ec.europa.eu

---. (2021a). *SET Plan Action 6 on Energy Efficiency in Industry.* https://setis.ec.europa.eu

---. (2021b). *Sustainable Finance Package.* https://ec.europa.eu

---. (2021c). *EU Transport in Figures.* https://op.europa.eu

---. (2021d). *Amendment of the Regulation Setting CO_2 Emission Standards for Cars and Vans.* https://ec.europa.eu

---. (2021e). *Proposal for a Regulation of the European Parliament and of the Council Amending Regulation (EU) 2019/631 as Regards Strengthening the CO_2 Emission Performance Standards for New Passenger Cars and New Light Commercial Vehicles.* https://ec.europa.eu

---. (2022a). *Renewable Energy Directive.* https://energy.ec.europa.eu/topics/renewable-energy

---. (2022b). *Renewable Energy Targets.* https://energy.ec.europa.eu/topics/renewable-energy

---. (2022c). *Energy Efficiency in Industry.* https://setis.ec.europa.eu/implementing-actions

---. (2022d). *Energy Efficient Buildings.* https://energy.ec.europa.eu/topics/energy-efficiency

---. (2022e). *Nearly Zero Energy Buildings.* https://energy.ec.europa.eu/topics/energy-efficiency

---. (2022f). *Long-Term Renovation Strategies.* https://energy.ec.europa.eu/topics/energy-efficiency

---. (2022g). *Revision for Phase 4 (2021–2030).* https://ec.europa.eu/clima/eu-action

---. (2022h). *European Green Deal: Commission Adopts New Proposals to Stop Deforestation, Innovate Sustainable Waste Management and Make Soils Healthy for People, Nature and Climate.* https://ec.europa.eu

---. (2022i). *New EU Forest Strategy for 2030.* https://environment.ec.europa.eu/strategy/forest-strategy_en

---. (2022j). *Sustainability-Related Disclosure in the Financial Services Sector.* https://ec.europa.eu

European Environment Agency. (2021). *Decarbonising Road Transport - the Role of Vehicles, Fuels and Transport Demand.* https://www.eea.europa.eu

Food and Agriculture Organization (FAO). (2022). *Emissions Totals: Agriculture.* http://www.fao.org/faostat

Global Forest Resources Assessment. (2020). *Annual Forest Expansion, Deforestation and Net Change Indicator.* Food and Agriculture Organisation. https://fra-data.fao.org/WO/fra2020/forestAreaChange/

The Guardian. (2022). *EU Plans 'Massive' Increase in Green Energy to Help End Reliance on Russia.* https://www.theguardian.com/environment

Gütschow, J. et al. (2021). *The PRIMAP-hist National Historical Emissions Time Series (1850-2018), V.2.2.* Zenodo Open Access Repository. https://doi.org/10.5281/zenodo.4479172

Institute for Climate Economics (I4CE). (2022). *Global Carbon Accounts 2021.* https://www.i4ce.org/

Institute for Health Metrics and Evaluation (IHME). (2020). *Global Burden of Disease Study* 2020. http://ghdx.healthdata.org/gbd-results-tool

Intergovernmental Panel on Climate Change (IPCC). (2022). *Sixth Assessment Report, WGII Summary for Policymakers. Headline Statements.* https://www.ipcc.ch/report/ar6/wg3/resources/spm-headline-statements/

International Energy Agency (IEA). (2021a). *Aviation.* https://www.iea.org/reports/aviation

OECD-IEA. (2022). *Fossil Fuel Support Database.* http://www.oecd.org/fossil-fuels/data

Oil Change International. (2022). *Shift the Subsidies Database.* http://priceofoil.org/shift-the-subsidies

Rogelj, J. et al. (2018). "Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development", in Masson-Delmotte, V. et al. (eds) *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C.* IPCC. https://www.ipcc.ch/

Romanello, M. et al. (2022). *The 2022 Report of The Lancet Countdown on Health and Climate Change.* https://www.thelancet.com/countdown-health-climate

Task Force on Nature-Related Financial Disclosures. (2022). *The TNFD Forum.* https://tnfd.global/

United Nations. (2018). *World Urbanisation Prospects.* UN Department of Economic and Social Affairs, Population Division. https://population.un.org/wup

United Nations Development Programme (UNDP). (2020). *Human Development Index Database.* http://hdr.undp.org/en/data#

United Nations Framework Convention on Climate Change (UNFCCC). (2021). *Decision 1/CMA.3, Glasgow Climate Pact.* https://unfccc.int/documents/460950

The World Bank. (2021). *GDP Per Capita (constant 2015 US$).* https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

---. (2022). *Population, Total.* https://data.worldbank.org/indicator/SP.POP.TOTL

World Resources Institute. (2021). *European Union's Just Transition Mechanism: Transnational Funding and Support for a Just Transition.* https://www.wri.org

World Steel Association. (2021). *Steel Data and Statistics.* https://www.worldsteel.org/

Partners

Data Partners

Funders

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag

Climate Transparency

Climate Transparency is a global partnership with a shared mission to stimulate a "race to the top" in climate action in G20 Members through enhanced transparency.

This country profile is part of the Climate Transparency Report 2022. Find the Highlights Report and other G20 Member profiles at **www.climate-transparency.org**