The EU’s ‘fair-share’ range is below 806 MtCO₂e by 2030 and below -3,989 MtCO₂e by 2050. Under the EU’s 2030 NDC target, emissions would only be limited to 3,390 MtCO₂e. The EU can achieve 1.5°C ‘fair-share’ compatibility via strong domestic emissions reductions, supplemented with support for emissions reductions abroad. All figures exclude land use emissions and are based on pre-COVID-19 projections.

**EU28 1.5°C ‘fair-share’ pathway (MtCO₂e/year)**

<table>
<thead>
<tr>
<th>Year</th>
<th>EU28</th>
<th>G20 average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>8.07</td>
<td>7.32</td>
</tr>
</tbody>
</table>

Sources: European Commission, 2019b, 2019e; European Council, 2019; Agora Energiewende and Sandbag, 2020; Artelys, 2020

**EU28 GHG emissions per capita have been in a declining trend over the past decade, and is slightly above the G20 average value in 2017.**

Data for 2017. Sources: Enerdata, 2020; UN Department of Economic and Social Affairs Population Division, 2020; Gütschow et al., 2019

**Countries (e.g. Poland, Czech Republic, Bulgaria and Romania) that have not adopted a coal phase-out plan and date need to do so urgently, so the EU can align with the Paris Agreement.**

The European Commission and Parliament separately proposed increasing the EU’s goal to “at least 55%” and “60%” below 1990 levels, respectively. EU member states have yet to agree to either proposal.

**While the share of coal decreased by 24% in 2019, there is a threat of potential carbon lock-in due to the use of natural gas. Not only has generation from this energy source increased by 12% in 2019, but the EU is also co-funding 32 new gas infrastructure projects worth EUR 29bn.**

**The adoption of the “climate neutrality by 2050” goal in December 2019 was a step in the right direction for the EU. However, the policy measures planned in the European Green Deal that may result in a radical ratcheting up of the EU’s emissions reduction efforts must still be ensured.**

**In July 2020 leaders of the EU Member States agreed to the multiannual financial framework (MFF) for 2021-2027, and a recovery plan called the “Next Generation EU” (NGEU). Combined, these will amount to over EUR 1.8tn and at least 30% of this amount is to be spent on climate action.**

Reference: European Council, 2020

* Due to data availability at the time of writing and despite the UK’s withdrawal from the EU on 31 January 2020, the report still presents emissions data for the EU28. The UK’s lack of participation in the EU’s policymaking processes in the months preceding its official withdrawal, however, means that the political decisions presented concern the EU27 not the EU28.
SOCIO-ECONOMIC CONTEXT

**Human Development Index**

The Human Development Index reflects life expectancy, level of education, and per capita income. EU28 ranks very high.

Data for 2018. Weighted average calculate for all EU Member States. Source: UNDP, 2019

**Gross Domestic Product (GDP) per capita**

EU28: 41,373

EU28 average: 22,230


**Population and urbanisation projections (in millions)**

- **2018:** 513.2 urban, 70.9%
- **2030:** 512.5 urban, 78.7%
- **2050:** 502.8 urban, 84.6%

The EU28’s population is expected to decrease by about 2% by 2050 but also become more urbanised.

Data for 2018. Sources: United Nations, 2018; The World Bank, 2019

**Death rate attributable to air pollution**

Ambient air pollution attributable death rate per 1,000 population per year, age standardised.

EU28: 0.3

G20 range: 0.1–1.1

Over 225,000 people die in the EU28 every year as a result of outdoor air pollution, from stroke, heart disease, lung cancer and chronic respiratory diseases. Compared to total population, this is still one of the lowest levels in the G20.

Data for 2016. Source: WHO, 2018

JUST TRANSITION

To mitigate the impact of coal phase-out on affected communities, in 2017 the EU established a Platform for Coal Regions in Transition aiming at stakeholder knowledge-sharing and exchanges of experiences in affected regions.

The EU also created the Just Transition Mechanism, aiming to mobilise at least EUR 100bn between 2021 and 2027.

Additional resources were committed in the framework of the COVID-19 recovery programmes adopted by the European Council in July 2020.

The money will be spent based on just transition plans prepared by the governments of the Member States for the regions affected by coal phase-out.

References: European Commission, 2019a, 2020c, 2020b; Climate Investment Funds, 2020
1. ADAPTATION
ADDRESSING AND REDUCING VULNERABILITY TO CLIMATE CHANGE

The European Union is vulnerable to climate change and adaptation actions are needed. On average, 474 fatalities and almost USD 4bn losses occur annually due to extreme weather events. With global warming, society and its supporting sectors are increasingly exposed to severe impacts such as droughts and reduction in crop duration in the agricultural sector.

ADAPTATION NEEDS

Climate Risk Index
Impacts of extreme weather events in terms of fatalities and economic losses that occurred. All numbers are averages (1999-2018).

<table>
<thead>
<tr>
<th>Annual weather-related fatalities</th>
<th>Annual average losses (USD mn PPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,045 DEATHS</td>
<td>$15,820 PER UNIT GDP (%)</td>
</tr>
</tbody>
</table>

Source: Based on Germanwatch, 2019

Exposure to future impacts at 1.5°C, 2°C and 3°C
Impact ranking scale:

<table>
<thead>
<tr>
<th>1.5°C</th>
<th>2°C</th>
<th>3°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of area with increase in water scarcity</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>% of time in drought conditions</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Heatwave frequency</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Days above 35°C</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Reduction in crop duration</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Hot spell frequency</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Reduction in rainfall</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Reduction in crop duration</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Hot spell frequency</td>
<td>!</td>
<td>!</td>
</tr>
<tr>
<td>Reduction in rainfall</td>
<td>!</td>
<td>!</td>
</tr>
</tbody>
</table>


Note: These indicators are national scale results, weighted by area and based on global data sets. They are designed to allow comparison between regions and countries and, therefore, entail simplifications. They do not reflect local impacts within the country. Please see technical note for further information.

CORONAVIRUS RECOVERY
Increasing resilience was one of the three priorities of the EU’s COVID-19 recovery package; however, it applied to economic and social resilience without explicitly mentioning adaptation to climate change. Nonetheless, resources spent on modern, sustainable agriculture may also be used to increase the resilience of this sector when faced with droughts and heatwaves.
Adaptation **readiness**

The figure shows 2000-2015 observed data from the ND-GAIN Index overlaid with projected Shared Socioeconomic Pathways (SSPs) from 2015-2060.

On average the European Union scored well above the G20 average between 2000 and 2015 and is projected to continue doing so given its combination of social, economic and governance structures. Adaptation challenges still exist, but the EU is well-positioned to adapt if it puts in place measures compatible with SSP1, and to a lesser extent, SSP2. Other measures, as represented by SSP3, slow its readiness to adapt in the long term.

The readiness component of the Index created by the Notre Dame Global Adaptation Initiative (ND-GAIN) encompasses social, economic and governance indicators to assess a country’s readiness to deploy private and public investments in aid of adaptation. The index ranges from 0 (low readiness) to 1 (high readiness).

The overlaid SSPs are qualitative and quantitative representations of a range of possible futures. The three scenarios shown here in dotted lines are qualitatively described as a sustainable development-compatible scenario (SSP1), a middle-of-the-road (SSP2) and a ‘Regional Rivalry’ (SSP3) scenario. The shaded area delineates the G20 average in 2015 for easy reference.

Source: Andrijevic et al., 2020

---

**ADAPTATION POLICIES**

**National Adaptation Strategies**

<table>
<thead>
<tr>
<th>Document name</th>
<th>Publication year</th>
<th>Fields of action (sectors)</th>
<th>M&amp;E process</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU strategy on adaptation to climate change</td>
<td>2013</td>
<td>Agriculture, Biodiversity, Coastal areas and fishing, Education and research, Energy and industry, Finance and insurance, Forestry, Health, Infrastructure, Tourism, Transport, Urbanism, Water</td>
<td>Information provided by Member States under the Monitoring Mechanism Regulation (MMR)</td>
</tr>
</tbody>
</table>

**Nationally Determined Contribution (NDC): Adaption**

<table>
<thead>
<tr>
<th>Targets</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not mentioned</td>
<td>Not mentioned</td>
</tr>
</tbody>
</table>
2. MITIGATION
REDUCING EMISSIONS TO LIMIT GLOBAL TEMPERATURE INCREASE

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

EU28’s total GHG emissions (excl. land use) fell by over 25% between 1990-2018. After a 2% drop in 2018, more is expected for 2019, mostly due to a 9% drop from the EU ETS, responsible for approximately 45% of EU emissions.

In 2030, global CO₂ emissions need to be 45% below 2010 levels and reach net-zero by 2050. Global energy-related CO₂ emissions must be cut by 40% below 2010 levels by 2030 and reach net-zero by 2060.

Source: Rogelj et al., 2018

GHG emissions across sectors and CAT 1.5°C ‘fair-share’ range (MtCO₂e/year)

The EU’s emissions (excl. land use) decreased by 25% between 1990 and 2018, with reductions in all sectors except for transport, which increased by 20%. The fastest reduction in emissions took place in electricity generation, at 34%, with agriculture and buildings at 20% and 26%, respectively.

The 2030 climate target is an “at least 40%” reduction below 1990, but in September 2020 the Commission suggested an increase to “at least 55%”. The EU 2050 goal is for “climate neutrality”.

Sources: Gütschow et al., 2019; Climate Action Tracker, 2020

Energy-related CO₂ emissions by sector

The largest driver of overall GHG emissions are CO₂ emissions from fuel combustion. Fuel combustion emissions have steadily dropped over the past decade, and are now at 16% below 2010 levels, driven mostly by a switch from coal to renewables. From 2009, the transport sector became the largest source of emissions – now accounting for 30%.

Source: Enerdata, 2020

* ‘Other energy-related sectors’ covers energy-related CO₂ emissions from extracting and processing fossil fuels. Due to rounding, some graphs may sum to slightly above or below 100%.
**Energy Overview**

Fossil fuels make up 70% of the EU28’s energy mix. With the increase in renewable energy over the past decades, the carbon intensity of the energy mix has reduced from approximately 60 tCO₂/TJ in 1990 to 48 tCO₂/TJ in 2019.

The share of fossil fuels in the global primary energy mix needs to fall to 67% by 2030 and to 33% by 2050 (and to substantially lower levels without Carbon Capture and Storage).

Source: Rogelj et al., 2018

**Solar, Wind, Geothermal, and Biomass Development**

Solar, wind, geothermal and biomass account for 11% of the EU28’s energy supply – the G20 average is only 9%. The share in total energy supply has increased by around 23% between 2014 and 2019. Bioenergy (for electricity and heat) makes up the largest share.

Source: Enerdata, 2020

Decarbonisation rating: RE share of TPES compared to other G20 countries

5-year trend (2014-2019): Medium
Current year (2019): High

Source: own evaluation
Carbon Intensity of the Energy Sector

Tonnes of CO₂ per unit of total primary energy supply (tCO₂/TJ)

- EU28: 47.59 tCO₂/TJ
- G20 Average: 3.22 tCO₂/TJ

Source: Enerdata, 2020

Decarbonisation rating: carbon intensity of the energy sector compared to other G20 countries

5-year trend (2014-2019): High
Current year (2019): High

Carbon intensity shows how much CO₂ is emitted per unit of energy supply. Carbon intensity of EU28 was 48 tCO₂/TJ in 2019, which is one of the lowest among the G20. This reflects the continuously growing share of renewables in the energy mix.

Source: own evaluation

Energy supply per capita (GJ/capita)

- EU28: 129 GJ/capita
- G20 average: 97 GJ/capita

Sources: Enerdata, 2020; The World Bank, 2019

Decarbonisation rating: energy supply per capita compared to other G20 countries

5-year trend (2014-2019): Medium
Current year (2019): High

The level of energy use per capita is closely related to economic development, climatic conditions and the price of energy.

Energy use per capita in the EU28 is 129 GJ/capita, well above the G20 average (96 GJ), but is decreasing slightly (-0.3%, 2014-2019) in contrast to the increasing G20 average (+2%).

Source: own evaluation

Energy intensity of the economy (TJ/PPP USD2015 millions)

- EU28: 3.22 TJ/PPP USD2015 millions
- G20 average: 4.46 TJ/PPP USD2015 millions

Data for 2018. Sources: Enerdata, 2020; The World Bank, 2018

Decarbonisation rating: energy intensity compared to other G20 countries

5-year trend (2013-2018): Medium
Current year (2018): High

This indicator quantifies how much energy is used for each unit of GDP, which is closely related to the level of industrialisation, efficiency, climatic conditions and geography.

The EU28’s energy intensity is well below the G20 level and is decreasing at a similar speed (-11%, 2013-2018) as the G20.

Source: own evaluation
The EU28 still produces 15% of electricity from coal, 22% from gas and 2% from oil. It needs to decarbonise the power sector completely by 2040 (at the latest) in order to be in line with a 1.5°C limit.

Coal and decarbonisation
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. Electricity generation has to be decarbonised before 2050, with renewable energy the most promising alternative.

STATUS OF DECARBONISATION

Electricity mix

The EU28 is increasingly producing power from renewables, mainly from large hydropower and onshore wind. In total, renewables account for about a third of the power mix. The share of coal power has decreased over the past decades but nevertheless accounted for 15% of the power mix in 2019.

Share of renewables in power generation (incl. large hydro)

Decarbonisation rating: share of renewables compared to other G20 countries

Source: own evaluation

Source: Enerdata, 2020
**POLICY ASSESSMENT**

**Renewable energy** in the power sector

Should the European Council adopt the “at least 55%” emissions reduction goal suggested by the European Commission, the share of renewables in the power sector will need to increase to at least 65% in 2030. Development of renewables in the EU is driven by partial internalisation of the externalities resulting from the combustion of fossil fuels via emissions trading in the framework of the EU ETS. Support mechanisms for renewables will also be important.

*References: own evaluation, based on European Commission, 2020a.*

**Coal phase-out** in the power sector

Coal power plants have already been phased out in three EU countries: Belgium, Sweden and Austria. An additional 11 countries have announced a coal phase-out, all but Germany before 2030, with most aiming to phase out coal before 2025. In Czech Republic and Spain, coal phase-out is under discussion, with 2025 as the potential phase-out date discussed in the latter. **Only five EU Member States, all Eastern European, have no plans nor held discussions on the future of coal in their countries.** Of those, only in Poland does coal play an important role: with over 30 GW installed, it is responsible for 22% of total EU27 coal capacity, second only to Germany. However, a recent draft of Poland’s “Energy Policy until 2040” indicates it may decrease the share of coal in its electricity mix to as low as 11% from 75% currently.

*References: own evaluation, based on Europe Beyond Coal, 2020; Ministry of Climate, 2020.*

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**Emissions intensity** of the power sector

Country vs G20 average (gCO₂/kWh)

For each kilowatt hour of electricity, 238gCO₂ are emitted in the EU28. This is nearly half that of the G20 average. The emissions-intensity dropped by 21% between 2014 and 2019, reflecting the decreasing share of fossil fuels in the electricity generation mix.

**Decarbonisation rating:** emissions intensity compared to other G20 countries

- **5-year trend** (2014-2019):
  - EU28: High
  - G20 average: High

- **Current year** (2019):
  - EU28: High
  - G20 average: High

*Source: own evaluation*
TRANSPORT SECTOR
Emissions from energy used to transport people and goods

The transport sector is the second largest emitting sector in the European Union. The sector’s much slower emissions reductions, especially compared with the power sector, led to an increased share of total emissions from 14% in 1990 to 22% in 2018. The increase in electrically-charged vehicles (including plug-ins), which in the first half of 2020 reached a share of 7%, creates the potential for accelerating emissions reductions. To stay within a 1.5°C limit, all new EU-registered vehicles need to be electric by 2030.

Share in energy-related CO₂ emissions from transport sector

Source: Enerdata, 2020

0.59% Electricity-related emissions
29% Direct emissions

COMPATIBILITY
The share of low-carbon fuels in the transport fuel mix must increase to about 60% by 2050.
Source: Rogelj et al., 2018

STATUS OF DECARBONISATION

Transport energy mix

Final energy consumption of transport by source (PJ/year)

Due to rounding, some graphs may sum to slightly above or below 100%.

Electricity and biofuels make up only 7% of the energy mix in transport, with the rest coming from oil. The EU has a goal to increase the share of renewables in the power sector to at least 14% in 2030.

Transport emissions per capita excl. aviation (tCO₂/capita)

EU28: 1.87
G20 average: 1.16

Data for 2018. Source: Enerdata, 2020

Decarbonisation rating: transport emissions compared to other G20 countries

5-year trend (2013-2018): Medium
Current year (2018): Medium

Source: own evaluation
**Aviation emissions per capita**

(\(\text{tCO}_2/\text{capita}\))

![Aviation emissions comparison chart]

Data for 2017. Source: Enerdata, 2020

**Decarbonisation rating: aviation emissions compared to other G20 countries**

- **5-year trend (2012-2017):** Medium
- **Current year (2017):** Low

*Source: own evaluation*

**Motorisation rate**

**587** VEHICLES PER 1,000 INHABITANTS (2016)

Data for 2016. Source: Vieweg et al., 2018

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

No data available

*Source: IEA, 2019*

**Passenger transport**

(modal split in % of passenger-km)

<table>
<thead>
<tr>
<th>Mode</th>
<th>EU28</th>
<th>G20 average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Rail</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>Road, car</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>Road, bus</td>
<td>8%</td>
<td>17%</td>
</tr>
<tr>
<td>Inland waterways</td>
<td>1%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Data for 2015. Source: Vieweg et al., 2018

**Freight transport**

(modal split in % of tonne-km)

- **2015**
  - Rail: 17%
  - Road: 75%
  - Air: 1%
  - Inland waterways: 6%

*Data for 2015. Source: Vieweg et al., 2018*

## POLICY ASSESSMENT

**Phase out fossil fuel cars**

- **Medium**

Some EU Member States have already announced plans to ban the sale of combustion cars in the coming decades. The most ambitious are Denmark, the Netherlands, and Sweden which plan to phase out sales of combustion vehicles by 2030. France plans to do so by 2040. The phase-out of combustion vehicles is driven in the EU by increasingly ambitious emissions standards and promotion of zero- and low-emissions vehicles (ZLEV). According to the EU regulation from 2019, at least 15% of passenger cars and light vans must be ZLEV. By 2030, this share should increase to 35%.

*References: own evaluation, based on Dutch Government, 2017; Electrive, 2019; WEF, 2017; European Commission, 2019f*

**Phase out fossil fuel heavy-duty vehicles**

- **Medium**

While there is no phase-out date for combustion heavy-duty vehicles in any of the EU Member States, the EU was the first of the G20 members to adopt emissions standards for heavy-duty vehicles. According to regulations adopted in 2019, emissions from new vehicles should decrease by 15% in the period 2025-2029 and by 30% from 2030 onwards, in comparison to emissions of the new vehicles sold between 1 July 2019 and 30 June 2020. The regulation also sets a 2% benchmark for the share of zero- and low-emission vehicles (ZLEV). Whereas failing to meet this benchmark does not result in any negative consequences, exceeding it leads to more lenient emissions standards for the remaining vehicles. In 2019 the EU amended its directive on clean and energy-efficient road transport and set a minimum share of clean heavy-duty vehicles (trucks and buses) in the total number of heavy-duty vehicles contracted by Member States.

*References: own evaluation, based on European Parliament and the Council of the European Union, 2019a, 2019b*

**Modal shift in (ground) transport**

- **Medium**

Between 2001 and 2016 the EU adopted four railway packages aiming at strengthening the position of railways in comparison to other modes of transport. The measures adopted include creation of a single European railway area that facilitates competition between different railway service providers and increasing the interoperability of the railway system. However, these efforts still did not have an impact on shifting freight transport from road to railways: between 2013 and 2018 the share of freight transported by rail remained constant at 18.7%, whereas the share of freight transported by road increased from 73.9-75.3% at the costs of inland shipping. Currently the EU is discussing amending the 1992 Directive on combined transport that would also include broadening its scope to national intermodal operations and extending economic support measures for transshipment terminals, which could facilitate a shift from road to rail especially for long distances (European Parliament, 2020). Shifting EU investment from road to rail infrastructure offers the potential to increase the attractiveness of low carbon modes of transport.

*References: own evaluation, based on European Commission, 2020b; Eurostat, 2020*
The EU28’s building emissions – counting heating, cooking and also electricity use – make up about a third of total energy-related CO₂ emissions. Per capita, building-related emissions are above the G20 average.

Global emissions from buildings need to be halved by 2030, and be 80–85% below 2010 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

Source: Rogelj et al., 2018

The EU28’s building emissions – counting heating, cooking and also electricity use – make up about a third of total energy-related CO₂ emissions. Per capita, building-related emissions are above the G20 average.

Global emissions from buildings need to be halved by 2030, and be 80–85% below 2010 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

Source: Rogelj et al., 2018

### Building emissions per capita

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-11.49%</td>
</tr>
<tr>
<td>EU28</td>
</tr>
</tbody>
</table>

Decarbonisation rating: building emissions compared to other G20 countries

- Current year (2019): Medium

Source: own evaluation

### Policy assessment

#### Near zero energy new buildings

Emissions from the buildings sector in the EU are covered by the Energy Performance Buildings Directive (EPBD). This directive, amended in 2018, obliges Member States to introduce minimum energy performance requirements and ensure that, from 2021, all new buildings are “nearly zero energy buildings” (NZEB). European legislation also contributes to increasing the energy-efficiency of household appliances in the framework of the Eco-design and the Energy Labelling directives which are set to reduce emissions by 315 MtCO₂e in 2020 and 515 MtCO₂e in 2030. Fuel switch away from fossil fuels is driven by the planned phase-out of fossil fuels in heating. Some countries have already introduced such a ban (e.g. Denmark) or are planning to do so (e.g. the Netherlands and the UK).

References: own evaluation, based on European Parliament and the Council of the European Union, 2018c; IEA, 2017; Cambridge Econometrics, 2019; Energy Saving Trust, 2019; European Commission, 2017

#### Renovation of existing buildings

The EU’s EPBD directive amended in 2018 obliges each member state to submit a long-term renovation strategy leading to fully decarbonising its building stock by 2050, with specific milestones for 2030. To meet this goal the EU needs to significantly accelerate its renovation rate, which currently amounts to about 1% annually. In October 2020 the European Commission plans to publish its “Renovation Wave” initiative under the European Green Deal. A renovation rate of 3.5% would be 1.5°C compatible.

References: own evaluation, based on European Parliament and the Council of the European Union, 2018c; Climate Action Tracker, 2020a; European Commission, 2019b
Industry-related emissions make up about a third of total CO₂ emissions in the EU28 and the level of emissions from this sector is increasing slightly.

**Share in energy-related CO₂ emissions from industrial sector**

- **20%** Direct emissions
- **9%** Electricity-related emissions

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

**COMPATIBILITY**

Source: Rogelj et al., 2018

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**STATUS OF DECARBONISATION**

**Industry emissions intensity**

- **EU28:** 0.30 (tCO₂e/USD2015 GVA)
- **G20 average:** 0.71

**Carbon intensity of cement production**

- **EU28:** 563 (kgCO₂/tonne product)
- **World average:** 614

**Carbon intensity of steel production**

- **EU28:** 1,209 (kgCO₂/tonne product)
- **World average:** 1,900

EU28’s cement industry is less emissions intensive than the world average.

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

**Decarbonisation rating: emissions intensity of industry compared to other G20 countries**

- **5-year trend (2011-2016):** 
  - **EU28:** -15%
  - **G20 average:** -12%

- **Current year (2016):**
  - **EU28:** Very high
  - **G20 average:** Medium

Source: own evaluation

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**POLICY ASSESSMENT**

**Energy Efficiency**

- **EU208:** Medium

In 2018 the EU added a new goal to its energy efficiency directive: decreasing the EU’s energy consumption by 32.5% compared with earlier 2018 projections. This should result in energy consumption of the EU28 not exceeding 1,273 MtOE (million tonnes of equivalent) of primary energy and/or no more than 956 MtOE of final energy. Achieving the “at least 55%” by 2030 emissions reduction goal would require decreasing energy consumption by between 36-37% for final energy and 39-41% for primary energy. The EU ETS covers emissions from the industry sector, including those resulting from energy consumption. To avoid carbon leakage, sectors deemed vulnerable to the risk of carbon leakage receive emissions allowances free of charge, up to a level reflecting the state-of-the-art benchmarks. The criteria for selecting subsectors at risk of carbon leakage are becoming increasingly stringent, decreasing the share of emissions allowances distributed for free to the industry from 80% in 2013 to 30% in 2020.

References: European Commission, 2015, 2020a; European Parliament and the Council of the European Union, 2018a
The EU’s agricultural emissions decreased by 20% between 1990 and 2018. Most of the decrease took place in the early 1990s, and emissions remained at a constant level over the last decade. The overall decrease in emissions resulted in a higher share of emissions from agriculture, increasing from 8.3% in 2006 to 10.3% in 2018.

Source: European Environment Agency, 2020a

Methane emissions (mainly enteric fermentation) 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).

Source: Rogelj et al., 2018

In the EU28, the largest sources of GHG emissions in the agricultural sector are digestive processes in animals (enteric fermentation), livestock manure and the use of synthetic fertilisers. A shift to organic farming, more efficient use of fertilisers and dietary changes can help reduce emissions.

In July 2020 the European Commission began consultation on addressing methane emissions, aiming to identify the main areas of action to significantly reduce anthropogenic methane emissions.

Sources: European Commission, 2020a; FAO, 2019

Due to rounding, some graphs may sum to slightly above or below 100%.
MITIGATION: TARGETS AND AMBITION

The combined mitigation effect of nationally determined contributions (NDC) submitted by September 2020 is not sufficient and will lead to a warming of 2.7°C by the end of the century. This highlights the urgent need for all countries to submit more ambitious targets by 2020, as they agreed in 2015, and to urgently strengthen their climate action to align to the Paris Agreement’s temperature goal.

AMBITION: 2030 TARGETS

Nationally Determined Contribution (NDC): Mitigation

<table>
<thead>
<tr>
<th>Targets</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU wide target: in September 2020 the European Commission proposed increasing EU’s 2030 emissions reduction goal to “at least 55%” from the current outdated goal of “at least 40%” adopted in 2014.</td>
<td>Not mentioned</td>
</tr>
</tbody>
</table>

Climate Action Tracker (CAT) evaluation of NDC and actions

- Critically Insufficient
- Highly Insufficient
- Insufficient
- 2°C Compatible
- 1.5°C Compatible
- Role Model

NDCs rated “insufficient” are in the least stringent part of a country’s ‘fair-share’ range and not consistent with holding warming below 2°C, let alone with the Paris Agreement’s stronger 1.5°C limit. If all government NDCs were in this range, warming would reach over 2°C and up to 3°C.

The EU is currently discussing increasing its emissions reduction goal to “at least 55%” and possibly “at least 60%”.

This does not go far enough. An increase of this goal – to 65% – accompanied with funding climate action abroad, would make the EU the first region with commitments compatible with the Paris Agreement. Rating individual member states as part of the EU is difficult because of the internal burden sharing system, interlinkage of the actions through the emission trading system and redistribution of financial flows, linked electricity sector. We therefore do not provide a 1.5°C and 2°C temperature levels for EU member states.

Evaluation as at October 2020, based on the EU’s NDC. Source: Climate Action Tracker

TRANSPARENCY: FACILITATING AMBITION

Countries are expected to communicate their NDCs in a clear and transparent manner in order to ensure accountability and comparability.

The NDC Transparency Check has been developed in response to Paris Agreement decision (1/CP.21) and the Annex to decision 4/CMA.1. While the Annex is only binding from the second NDC onwards, countries are “strongly encouraged” to apply it to updated NDCs, due in 2020.

NDC Transparency Check recommendations

For more visit www.climate-transparency.org/ndc-transparency-check

To ensure clarity, transparency and understanding, it is recommended that the EU provides additional detailed information in the upcoming NDC Update (compared to the existing NDC), including:

- Provide link to the long term temperature goal of the Paris Agreement. Include grounds on why the NDC target is fair and why it constitutes the EU’s “highest possible ambition”.
- Expressly cover the land sector and explain how the land sector is included in the EU target.
- State source of data for quantifying the reference point as well as provide information under which the EU would update the value of the reference indicators.

AMBITION: LONG-TERM STRATEGIES

<table>
<thead>
<tr>
<th>Status</th>
<th>2050 target</th>
<th>Interim steps</th>
<th>Sectoral targets</th>
<th>Net-Zero target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted to the UNFCCC in March 2020 on behalf of the EU27 (excluding the UK)</td>
<td>“Climate neutrality” goal by 2050</td>
<td>None</td>
<td>No</td>
<td>“Climate neutrality” goal by 2050</td>
</tr>
</tbody>
</table>

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies by 2020. Long-term strategies are an essential component of the transition toward net-zero emissions and climate-resilient economies.
3. Finance

Making Finance Flows Consistent with Climate Goals

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

While the EU decided to spend almost a third of its Recovery Package and Multiannual Financial Framework on climate action, it continued subsidising fossil fuels, countering the impact of these significant expenditures.

1.5°C Compatibility

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

Source: 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

No data available

According to the assessment of the European Commission, between 2008 and 2016 annual subsidies to fossil fuels remained at between EUR 54 and EUR 60bn. The largest beneficiary were fossil fuels in the electricity sector which, in 2016, benefitted from EUR 16bn, followed by transport with EUR 12bn.

Source: European Commission, 2019d

Fossil Fuel Subsidies by fuel type

No data available

The latest estimates on fossil fuel subsidies being provided through the EU’s long-term budget, the Multiannual Financial Framework (MFF), totalled USD 604m (EUR 515m) per year between 2014-16 (Gencsu et al., 2017). The MFF includes two mechanisms of support to fossil fuels (mainly to oil and gas infrastructure projects): the European Regional Development Fund and the Connecting Europe Facility.

Carbon Pricing and Revenue

In 2005, the EU introduced the Emissions Trading Scheme (ETS), which in 2019 generated USD 17.5bn of revenues. The scheme covers 45% of European emissions (in the power, industry and aviation sectors), with emissions priced at USD 28/tCO₂ in 2019.

Source: I4CE, 2019; OECD, 2018

Carbon revenues (USD millions)

Source: I4CE, 2019; OECD, 2018

Coronavirus Recovery

In addition to the EU’s Recovery Package – at least 30% of which should be spent on climate action – Member States have also adopted their own financial measures to address the economic repercussions of the response to the coronavirus. These include bailouts for fossil fuels intensive sectors with weak, or even absent, conditionalities. The airline industry has been a primary beneficiary of these unconditional bailouts.
Governments steer investments through their public finance institutions, including via development banks, both at home and overseas, and green investment banks. Developed G20 countries 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 fossil fuels

The EU has cut down its financing for coal in recent years, in line with EU-level commitments. As such, the EU’s budget and key public investment banks, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD), no longer finance coal mining or coal-fired power projects. However, the EIB and EBRD have been financing oil and gas projects during the period 2016-2018, estimated at USD 2.1bn and USD 1.09bn, respectively. EU public finance institutions have committed to nearly full exclusion for all “unabated” oil projects from 2021 but have minimal exclusion for gas projects.

Source: Oil Change International, 2020

Provision of international public support

Climate finance contributions are sourced from Party reporting to the UNFCCC.

Bilateral, regional and other channels

Annual average contribution: 3,165.97 MN USD

Theme of support:

- 36% Cross-cutting
- 23% Mitigation
- 41% Adaptation

Multilateral climate finance contributions

Annual average contribution: 3,243.05 MN USD

Theme of support:

- 100% Other

Core / General Contributions

Annual average contribution: 0 MN USD

The EU is listed in Annex II of the UNFCCC and as a bloc is formally obliged to provide climate finance. It is ranked fourth largest contributor of bilateral climate finance. In 2017/18, it corrected its earlier bias towards mitigation in bilateral climate finance flows, with amounts increasing since the 2015/16 period. In its most recent report, the EU includes EIB in its multilateral funding, hence the significant jump from the 2015/16 period. These contributions remain considered by the EU as climate-specific, rather than a core general contribution to a multilateral institution.
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.

<table>
<thead>
<tr>
<th>Category</th>
<th>Instruments</th>
<th>Objective</th>
<th>Under Discussion/implementation</th>
<th>None identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Financial Principles</td>
<td>n/a</td>
<td>This indicates political will and awareness of climate change impacts, showing where there is a general discussion about the need for aligning prudential and climate change objectives in the national financial architecture.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhanced supervisory review, risk disclosure and market discipline</td>
<td>Climate risk disclosure requirements</td>
<td>Disclose the climate-related risks to which financial institutions are exposed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Climate-related risk assessment and climate stress-test</td>
<td>Evaluate the resilience of the financial sector to climate shocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhanced capital and liquidity requirements</td>
<td>Liquidity instruments</td>
<td>Mitigate and prevent market illiquidity and maturity mismatch</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lending limits</td>
<td>Limit the concentration of carbon-intensive exposures</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incentivise low carbon-intensive exposures</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Differentiated reserve requirements</td>
<td>Limit misaligned incentives and channel credit to green sectors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While there are no mandatory EU-wide green financial regulations, the EU High Level Group on Sustainable Finance (HLEG) made recommendations on the need to improve the contribution of finance to sustainable and inclusive growth and mitigation, as well as to strengthen financial stability through the incorporation of ESG factors into investment decision making. In March 2018, the European Commission (EC) published its Action Plan on Financing Sustainable Growth, setting an EU strategy on sustainable finance and a roadmap for future work across the financial system. In June 2018, the EC set up the Technical Expert Group (TEG) to assist it in developing a unified classification system for sustainable economic activities (the so-called EU Taxonomy). In December 2018, the European Banking Association (EBA) joined the NGFS. In 2019, the TEG published three reports (EU Taxonomy, Green Bonds standards, and benchmarks on ESG disclosures). In December 2019, the EBA published its Action Plan on sustainable finance, describing its approach and timeline for delivering mandates related to environmental, social, and governance factors. The European Central Bank is a member of the NGFS.

**Nationally Determined Contribution (NDC): Finance**

<table>
<thead>
<tr>
<th>Conditionality</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment needs</td>
<td>Not specified</td>
</tr>
<tr>
<td>Actions</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>International market mechanisms</td>
<td>No contribution from international credits for the achievement of the target</td>
</tr>
</tbody>
</table>
For more detail on the sources and methodologies behind the calculation of the indicators, please download the Technical Note at: www.climate-transparency.org/g20-climate-performance/g20report2020

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

2 The 1.5°C ‘fair-share’ ranges for 2030 and 2050 are drawn from the CAT, which compiles a wide range of perspectives on what is considered fair, including considerations such as responsibility, capability, and equality. Countries with 1.5°C ‘fair-share’ ranges reaching below zero, particularly between 2030 and 2050, are expected to achieve such strong reductions by domestic emissions reductions, supplemented by contributions to global emissions reduction efforts via, for example, international finance. On a global scale, negative emissions technologies are expected to play a role from the 2030s onwards, compensating for remaining positive emissions. The CAT’s evaluation of NDCs shows the resulting temperature trajectories if all other governments were to put forward emissions reduction commitments with the same ambition level.

3 In order to maintain comparability across all countries, this report utilises the PRIMAP year of 2017. However, note that for consistency with the CAT annual CRF data is available for countries which have recently updated GHG inventories.

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

5 The selection of policies rated and the assessment of 1.5°C compatibility information by the Paris Agreement, the IPCC’s 2018 SR15 and the Climate Action Tracker (2016). The table below displays the criteria used to assess a country’s policy performance.

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).

BIBLIOGRAPHY


Climate Politics: Towards Regional Best Practices and Paris Agreement Compatibility in the Building Sector


