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THE COUNCIL**

EU and the Paris Climate Agreement: Taking stock of progress at Katowice COP

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and of the Council of 21 May 2013 on a mechanism for monitoring and reporting
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level relevant to climate change and repealing Decision No 280/2004/EC)**

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Climate action progress report

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1 Meeting the EU's international commitments

In 2018, the EU adopted legislation that will enable it to deliver on its commitment to reduce its greenhouse gas (GHG) emissions by at least 40 % by 2030 as compared with 1990. It also raised the level of its ambition on renewable energy and energy efficiency. Together, if fully implemented, it is estimated to result in a cut in EU emissions of around 45 % by 2030.

Under currently implemented policies, emissions in 2030 are projected to be 30 % below the 1990 level (based on projections from the Member States, mostly from March 2017). In order to meet their obligations under the new legislation, Member States will therefore have to formulate policies and measures to reduce emissions further.

The EU remains on track to reach its 2020 target of reducing GHG emissions by 20 % from 1990 levels. In 2017, EU GHG emissions were down by 22 %, according to preliminary data (covering emissions from international aviation, but not emissions and removals from land use, land-use change and forestry (LULUCF)). As Member States' projections indicate that emissions will decrease further, the EU expects to meet its 2020 target.

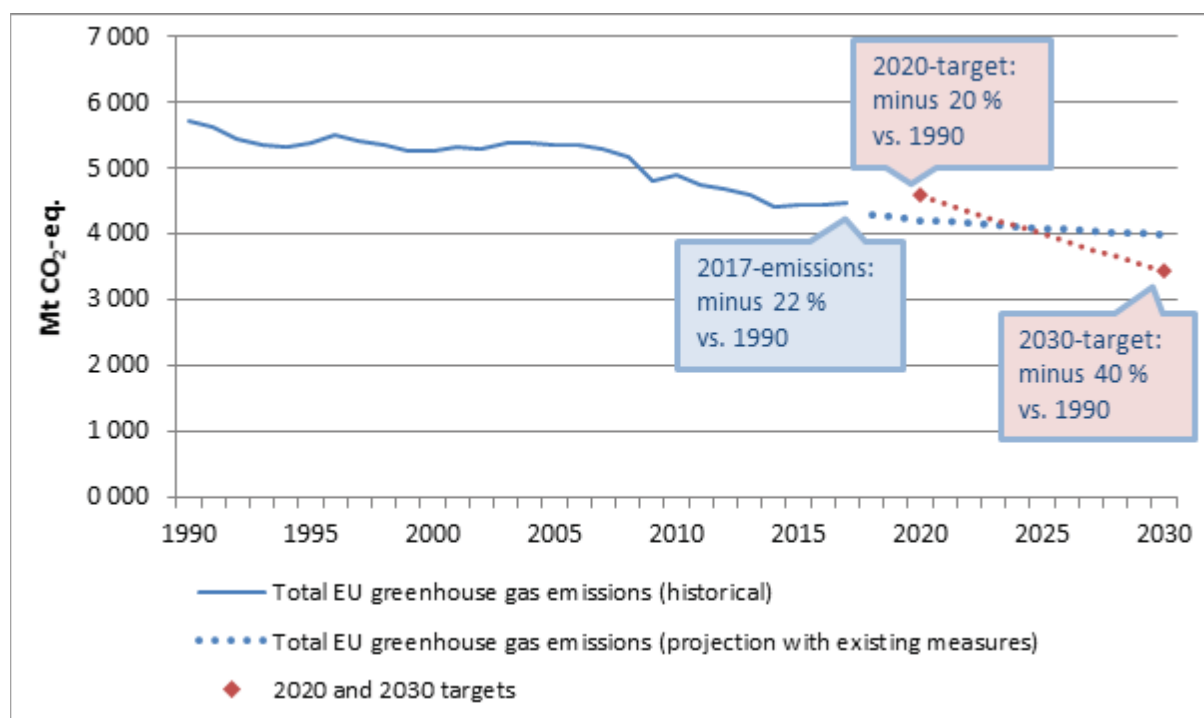


Figure 1: Total EU GHG emissions (historical emissions 1990-2017, projected emissions 2018-2030) (Mt CO₂-eq.) and GHG reduction targets.¹

In 2017, emissions were 0.6 % higher than in 2016, according to preliminary data. The increase came mainly in the transport sector and industry. However, the decoupling of economic activity from GHG emissions continued as the growth in emissions was

¹ The projections were submitted by Member States, mostly in March 2017, with 2015 as the latest available data.

significantly lower than the economic growth. The GHG emission intensity of the economy, defined as the ratio between emissions and GDP, fell to a record low of 315 g CO₂-eq. / EUR, which is half the 1990 level. Between 1990 and 2017, the EU's combined GDP grew by 58 %, while total GHG emissions decreased by 22 %.

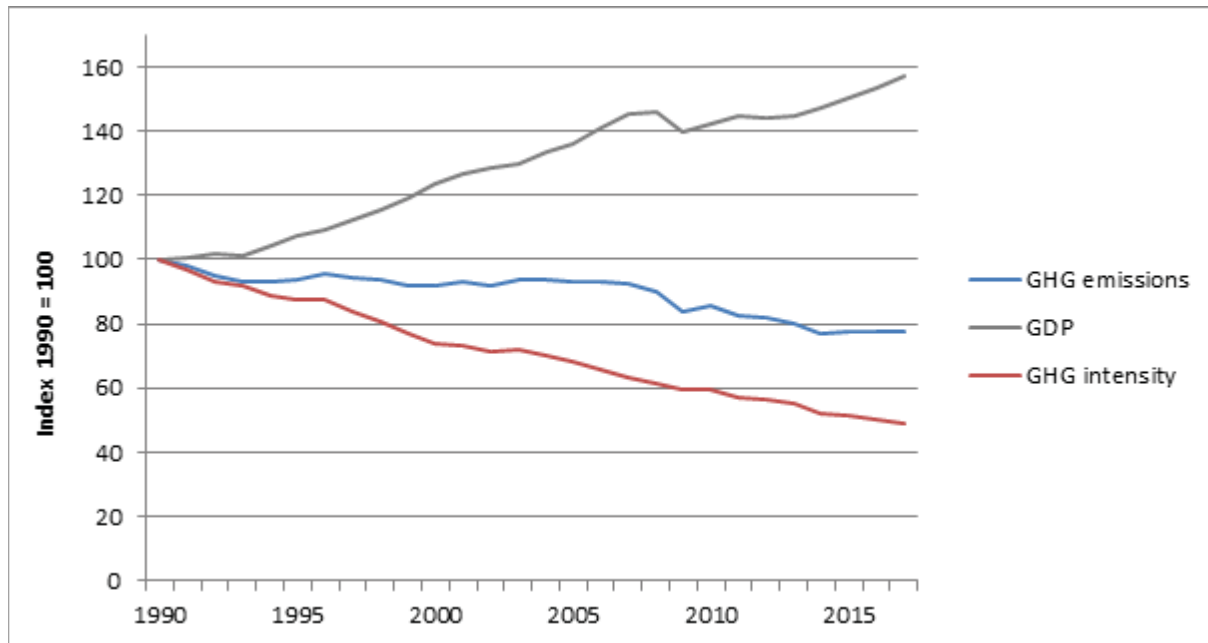


Figure 2: The EU's GHG emissions, real GDP and GHG emission intensity (1990 = 100).²

2 EU ETS emissions

The EU emissions trading system (EU ETS) covers approximately 11 000 power stations and manufacturing plants, and aviation within and between the participating countries.

2.1 EU ETS emissions in 2017

In 2017, emissions from installations covered by the EU ETS are estimated to have increased slightly (by 0.18 %) compared with 2016.³ The increase breaks a downward trend since the start of phase 3 in 2013 and can be explained by 2.4 % growth in real GDP, which is higher than in any year since the beginning of the current trading period.

The increase was driven mainly by industry, whereas emissions from the power sector fell slightly. Verified aviation emissions continued to grow, reaching 64.2 Mt CO₂ in 2017, a 4.5 % increase from 2016.

Exchanges of international credits for EU allowances have declined to a very low level. Over phases 2 (2008-2012) and 3 (from 2013), a total of 1.49 billion were used or exchanged to offset EU ETS emissions. In phase 3, about 436 million had been used by June 2018 (about

² GDP data: Ameco / ECFIN / World Bank. Estimates gap-filled by EEA.

³ Based on the information recorded in the Union Registry.

11.5 million in 2017 alone). As from 2021, it will no longer be possible to use international credits to comply with EU ETS obligations.

2.2 Revision of the regulatory framework of the EU ETS

On 9 November 2017, the European Parliament and Council reached provisional agreement on revising the EU ETS, mainly for the period after 2020. The revised ETS Directive was published on 14 March 2018.⁴ Among other things, it reduces the emissions cap further by raising the linear reduction factor to 2.2 % a year as of 2021. This means that, between 2021 and 2030, emissions will be cut by 48 Mt CO₂-eq. a year, as compared with 38 Mt in the current trading phase, thus keeping the EU ETS on track to meet its 43 % reduction target by 2030. As shown in figure 3, Member States' own projections, dating from 2017 for most Member States, show a smaller decrease in emissions than required by the ETS.

The revised Directive addresses the surplus of allowances that has built up since 2009, mainly as a result of the economic crisis and the use of international credits to offset emissions in the EU. Over the last three years, the surplus has been declining steadily, by almost half a billion allowances, see figure 3. This is in part thanks to the backloading of allowances.⁵ However, it remains substantial: currently over 1.6 billion allowances.⁶

⁴ Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814 (OJ L 76, 19.3.2018, p. 3–27).

⁵ Backloading refers to a short-term measure to postpone the auctioning of 900 million allowances from 2014-2016 to 2019-2020.

⁶ The Commission published the most recent surplus information in May 2018:
https://ec.europa.eu/clima/sites/clima/files/ets/reform/docs/c_2018_2801_en.pdf

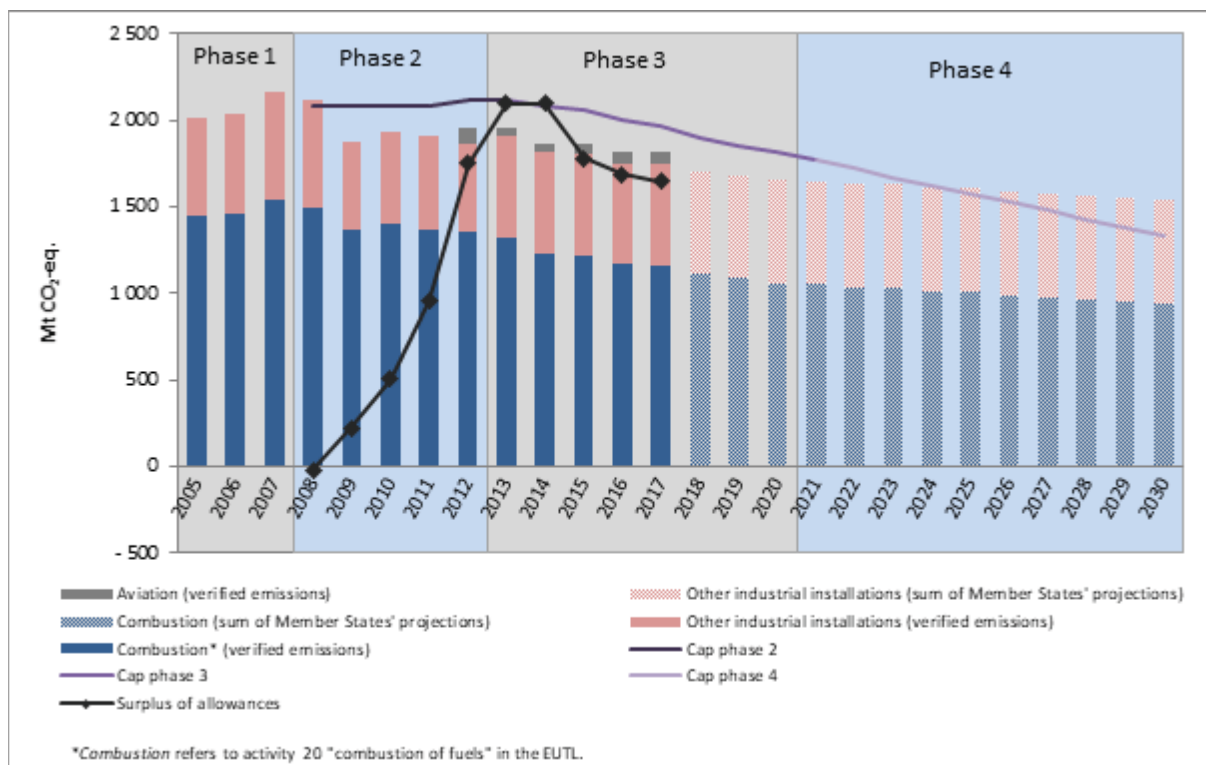


Figure 3: Verified ETS emissions 2005-2017, projected ETS emissions 2018-2030, ETS cap phases 2, 3 and 4, and accumulated surplus of ETS allowances 2008-2017 (Mt CO₂-eq.). The chart shows verified ETS emissions with the sectoral and geographical scope of ETS in the relevant year and can therefore not be read as a time series before 2013. Aviation is included in the cap for 2012-2017.⁷

The Directive also addresses the surplus by strengthening the market stability reserve (MSR), which will start operating on 1 January 2019. The MSR cuts the surplus by reducing auction volumes if it exceeds 833 million allowances, which is presently the case. The Directive makes two main changes to the functioning of the MSR:

- the percentage of the surplus to be placed in the reserve from 2019 to 2023 will be doubled from the initially agreed 12 % to 24 %, i.e. the surplus will be reduced more quickly; and
- from 2023, MSR holdings exceeding the previous year's auction volume will no longer be valid.

In practice, this means that, every year until 2023, the Commission will calculate how many allowances are in circulation (the surplus) and reduce the auction supply by 24 % of that

⁷ The split between combustion and other industrial installations is an estimate. Sources: Verified ETS emissions 2005-2017 (ETS data viewer/ EUTL). Projected emissions 2018-2030: Sum of Member States projections with existing measures (EEA).

number.⁸ If the surplus falls below 400 million allowances, the MSR will start releasing allowances back onto the market.

As a result, from January to August 2019, almost 265 million allowances (16 % of the surplus)⁹ will not be auctioned but instead be put into the MSR. Some 40 % fewer allowances will be auctioned than in the corresponding period in 2018. In short, the MSR reduces the surplus by lowering the supply of allowances to the market.

3 ‘Effort-sharing’ emissions

Emissions from most sectors not included in the EU ETS, such as transport, buildings, agriculture (non CO₂-emissions) and waste, are covered by the EU’s ‘effort-sharing’ legislation. The Effort-Sharing Decision¹⁰ (ESD) sets national emissions targets for 2020, expressed as percentage changes from 2005 levels. Member States must respect annual emissions limits from 2013 to 2020.

In the Effort-Sharing Regulation¹¹ (ESR), adopted in May 2018, EU leaders’ commitment to reducing emissions in effort-sharing sectors by 30 % by 2030 is translated – on the basis of fairness, cost-effectiveness and environmental integrity – into binding annual GHG emissions reductions for each Member State for 2021–2030.

The ESR recognises that Member States’ ability to take action varies and it sets differentiated national targets that primarily reflect *per capita* GDP. The 2030 targets range from 0 % to -40 % compared with 2005 levels.

The ESR maintains the forms of flexibility that exist under the current ESD (e.g. banking, borrowing, buying and selling of emission allocations between Member States), except for the use of international credits, which will not be allowed after 2020. In addition, eligible Member States will be allowed to use a limited number of ETS allowances, and all Member States will be allowed to use a limited amount of emissions removals in land-use sectors to meet part of their targets.

3.1 Emissions developments at EU level

Emissions covered by the ESD were 11 % lower in 2017 than in 2005. The EU thus over-achieved by 4 percentage points (pp) its interim target of a 7 % reduction. Since the system was launched in 2013, EU-wide emissions have been significantly below the total

⁸ A detailed explanation on the composition of the surplus and the methodology for calculating it year-on-year is available in the latest (2018) Commission Communication calculating the 2017 surplus:

https://ec.europa.eu/clima/sites/clima/files/ets/reform/docs/c_2018_2801_en.pdf

⁹ 24 % in 12 months is equivalent to 16 % in eight months.

¹⁰ Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of the Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 (OJ L 140, 5.06.2009, p.136).

¹¹ Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (OJ L 156, 19.6.2018, p. 26).

limit each year. This led to a cumulative surplus of annual emission allocations (AEAs) of about 1 023 Mt CO₂-eq. in 2013-2017, which corresponds to around 35 % of 2005 emissions.

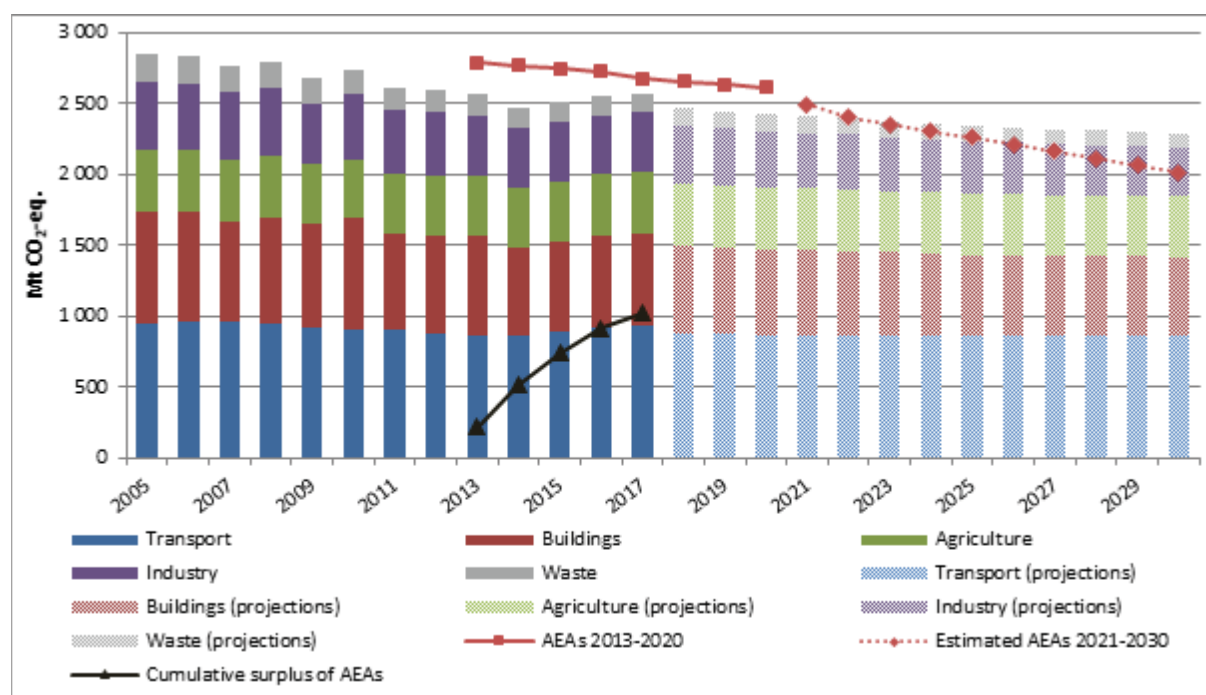


Figure 4: Emissions covered by the scope of the effort-sharing legislation 2005-2030 and AEAs (Mt CO₂-eq.)¹²

According to national projections based on existing measures, emissions in 2020 should be 16 % below the 2005 level, exceeding the 2020 target of a 10 % reduction. In 2030, emissions are projected to be 21 % lower than in 2005. To achieve the 2030 target of a 30 % reduction from the 2005 level, additional measures will therefore be necessary.

Preliminary 2017 data indicate that ESD emissions increased from 2016 to 2017 for the third consecutive year (by 0.8 %). Since the ESD came into effect in 2013, transport emissions have risen by 7 % and emissions from agriculture by 2 %, while those from other sectors have decreased.

Transport emissions covered by the ESD were slightly lower in 2017 than in 2005. Emissions from road transport have gone up as demand for mobility has grown throughout the 1990s until 2007. After a few years of decline, transport emissions increased again since 2014. Towards 2030, with existing policies a marginal decrease is projected. In view of these trends, the Commission has proposed a set of targeted regulatory actions for this sector (see section 5.1). Transport emissions make up 36 % of emissions covered by the ESD.

Emissions from **energy use in buildings** show some year-to-year variation due to weather-related changes in heating demand. However, they were 16 % lower in 2017 than in 2005 and the downward trend is projected to continue in the period to 2030.

¹² The sector here summarised as 'industry' aggregates ESD emissions of energy supply, manufacturing and product use, i.e. inventory source categories 1.A1., 1.A.2, 1.B, 1.C and 2.

Emissions from **agriculture** were at a similar level in 2017 as in 2005 and are projected to remain stable in the period to 2030, with existing policies.

Emissions from **waste management** decreased by 32 % between 2005 and 2017, and the steep downward trend is projected to continue.

ESD emissions from **industry and other sectors** were 12 % lower in 2017 than in 2005 and are projected to continue to fall.

Methane emissions have fallen steadily; in 2016, they were 38 % lower than in 1990, thanks partly to existing EU policies, notably the common agricultural policy and waste legislation. Methane emissions from agriculture (half of all methane emissions come from livestock) have fallen by 22 % since 1990 and those from waste management by 45 %. The new waste legislation adopted in May 2018¹³ will lead to further decreases in emissions from waste management as it introduces ambitious landfilling targets and restrictions, as well as mandatory separate collection of bio-waste.

Lower levels of coal mining and post-mining activities from energy production have led to a 56 % reduction in methane emissions from energy production since 1990.

On the other hand, EU emissions of greenhouse impacting fluorinated gases (**F-gases**) rose by 69 % between 1990 and 2016. This is due to increased use of hydrofluorocarbons (HFCs), mainly as substitutes for ozone-depleting substances. HFCs are used in various sectors and applications, including as refrigerants in refrigeration, air-conditioning and heat pump equipment; as blowing agents for foams; as solvents; and in fire extinguishers and aerosols.

While emissions of other F-gases (PFCs and SF₆) have decreased since 1990, F-gases still account for 2.7 % of all EU GHG emissions. Through the F-gas Regulation, the EU has taken steps to reduce emissions of F-gases (see section 5.4).

3.2 Member States' compliance with the Effort-Sharing Decision

All 28 Member States complied with their ESD obligations in 2013-2015. **Malta** exceeded its AEAs in each of the years in question, but covered the deficit by purchasing AEAs from Bulgaria. **Sweden** did not use its full allocation and cancelled the surplus AEAs to enhance the environmental integrity of the system as a whole. All other Member States banked their surplus allocations for use in later years. No international credits from the clean development mechanism (CDM) or joint implementation were used to comply with ESD obligations.

The compliance cycle for 2016 is ongoing. **Malta, Finland, Poland, Ireland, Germany and Belgium** exceeded their AEAs and will have to use flexibilities to ensure compliance. For Belgium, Finland, Germany, Ireland and Poland, this was the first time and they may use surplus AEAs banked from previous years. Malta has exceeded its AEAs every year since 2013 and will again need to purchase AEAs and/or international project credits.

The cumulative surplus of AEAs per Member State for 2013-2016 is shown in Figure 5.

¹³ http://europa.eu/rapid/press-release_IP-18-3846_en.htm

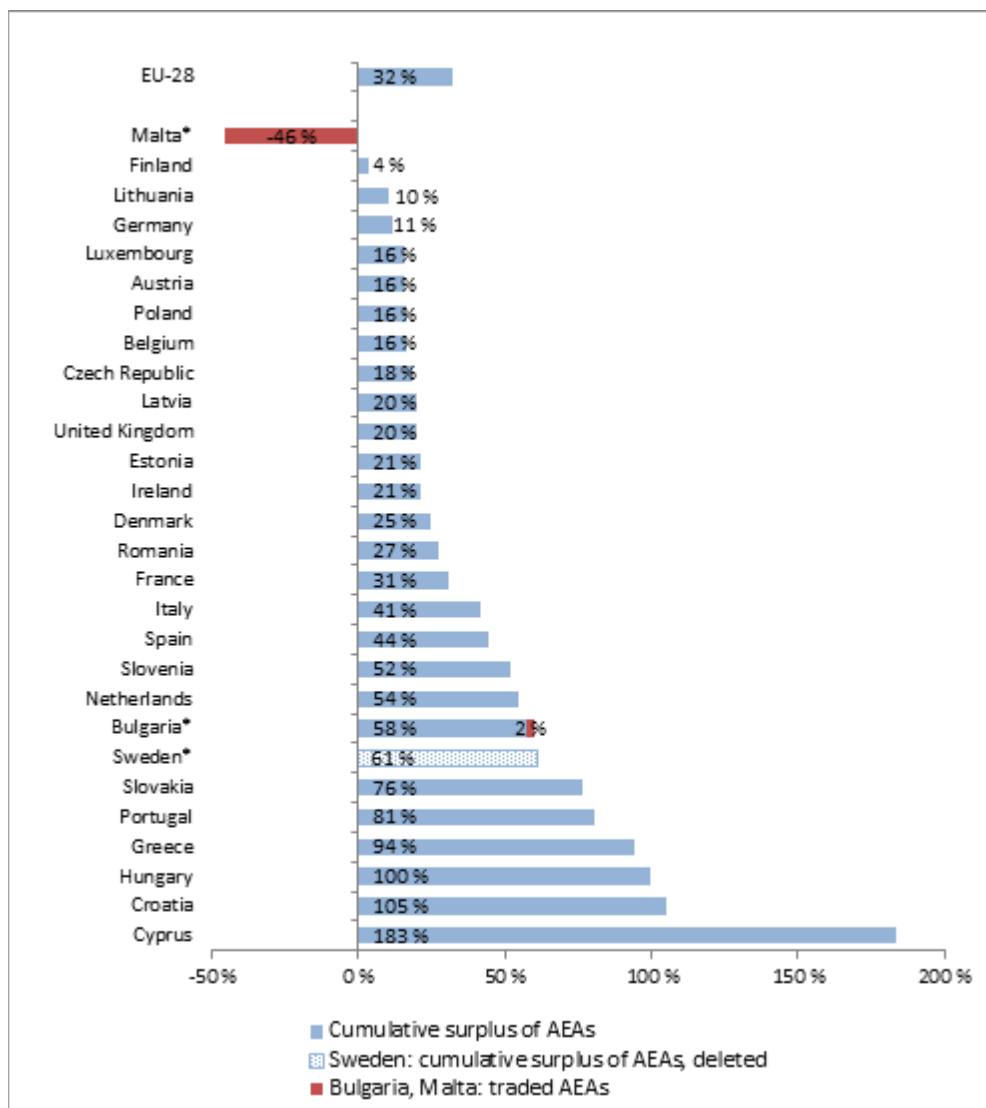


Figure 5: Cumulative surplus of AEAs as percentage of 2005 emissions, 2013-2016.

Preliminary data for 2017 show that most Member States’ emissions were lower than their AEAs. In nine cases (**Greece, Slovakia, Croatia, Romania, Hungary, Portugal, Sweden, the Netherlands and Slovenia**), emissions were 10 pp or more lower¹⁴.

It is estimated that **Malta, Germany, Ireland, Austria, Cyprus, Poland and Finland** exceeded their AEAs, as did Bulgaria, Estonia and Lithuania, but by less than 1 pp (according to preliminary data).

3.3 Towards 2020 and 2030

The new Regulation on the governance of the Energy Union (see section 5.3) requires the Member States to draw up national energy and climate plans setting out their policies and measures for the period to 2030. On the basis of existing measures, three Member States (Hungary, Portugal and Greece) project to over-achieve their 2030 targets and five others are

¹⁴ The percentage points represent the difference between emissions and AEAs expressed as percentage change from 2005 base year emissions.

broadly on track. This means that most will need to step up their efforts. Figure 6 shows the gaps between projected emissions and 2030 ESR targets.

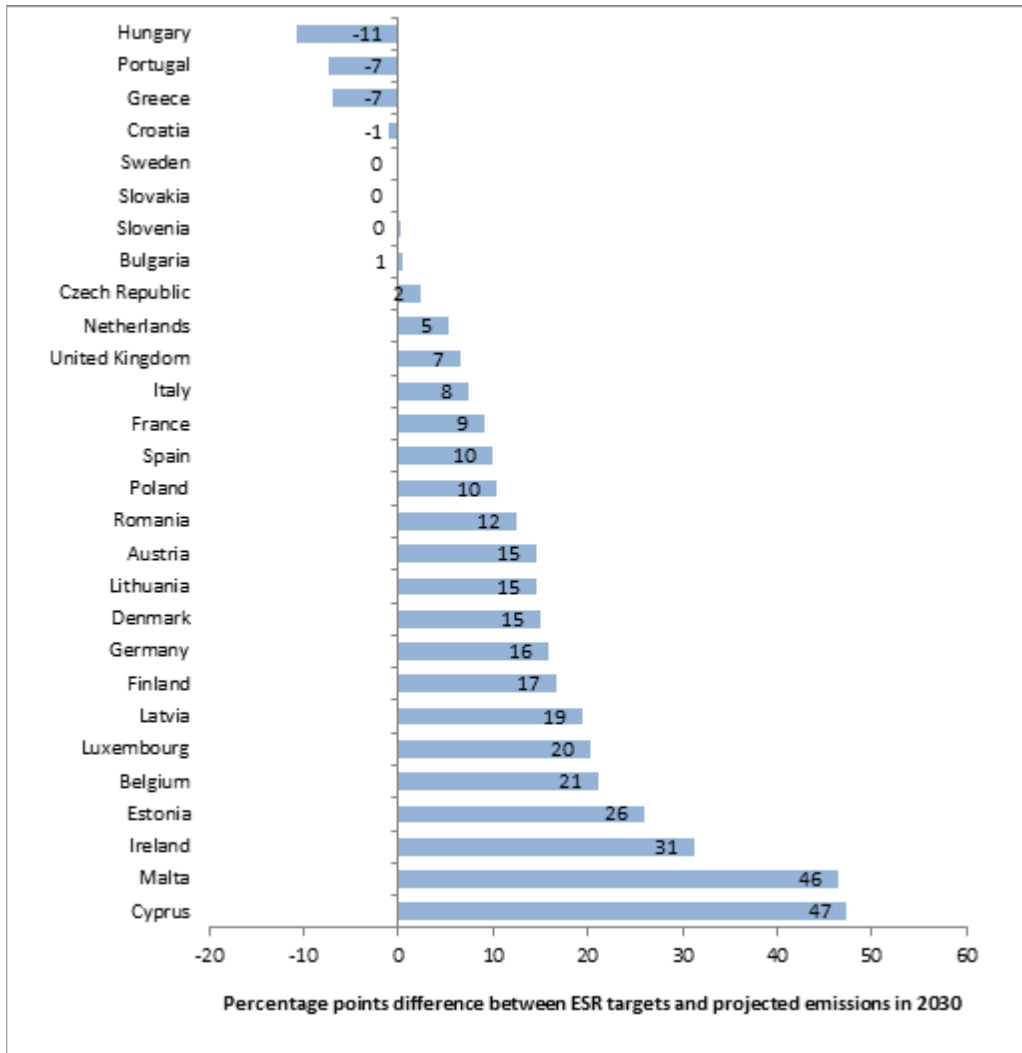


Figure 6: Gaps between 2030 ESR targets and projected emissions (percentage points).¹⁵ (Negative values indicate over-achievement of targets; positive values indicate a deficit).

Most Member States are expected to reach their 2020 ESD targets, but (according to national projections) eight may not: **Ireland** has projected that it may miss its target by 20 pp, while **Cyprus** and **Malta** may miss theirs by 12 pp and 11 pp respectively. **Belgium, Germany, Luxembourg, Austria and Finland** may also fall short, but by smaller margins.

Cyprus has projected that it may miss its targets for 2020 *and* 2030, by large margins. As shown in figure 6, with existing measures Cyprus projects to miss its 2030 target by 47 pp. However, Cyprus has projected that with additional measures, the gap may be reduced to 17 pp. Transport emissions are of special concern, as they are increasing.

Also **Malta** has projected that it may miss both targets by large margins. In addition to rising emissions from road transport, HFC emissions have been rising sharply, mainly because of

¹⁵ ESR targets and projected emissions expressed in percentage change from 2005 base year emissions.

increased demand for air-conditioning. In May 2018, as part of the European Semester annual cycle of economic coordination, Malta was urged to set targets and implement measures to reduce congestion and GHG emissions from transport substantially by 2025, allowing for periodic monitoring of progress.

Ireland has projected that it will miss both its 2020 and 2030 targets, with existing measures. It has banked its surplus allocations from 2013-2015, but this is not expected to cover the deficit in 2016-2020. In particular, transport emissions have increased sharply and the rise is projected to continue until 2025. In the 2018 European Semester, it was recommended that Ireland should ensure effective implementation of the national development plan, *inter alia* in terms of clean energy, transport and housing.

Also **Belgium** and **Luxembourg** has projected to miss both targets with existing measures. In the European Semester, it was recommended that Belgium should invest in new or existing transport infrastructure and improve incentives to use collective and low-emission transport.

In Luxembourg, about half of the GHG emissions come from road transport. In the European Semester, it was highlighted that Luxembourg's transport fuel taxes are among the lowest in the EU and that the most urgent challenge is to complete and upgrade rail infrastructures.

With existing policies, also **Estonia, Latvia, Finland, Germany, Denmark, Lithuania, Austria, Romania, Poland and Spain** have projected to miss their 2030 targets by more than 10 pp. All Member States projected to miss the 2030 targets are expected to set out in their national energy and climate plans (under the Governance Regulation) how they will seek to fulfil their obligations, in particular through new or strengthened policies and measures.

4 Land use, land-use change and forestry

In May 2018, the EU adopted the **LULUCF Regulation**,¹⁶ which integrates emissions and removals from land into the 2030 climate and energy framework. This is in line with the Paris Agreement, which points to the critical role of land use in reaching long-term climate mitigation objectives.

The LULUCF Regulation establishes the EU's commitment for 2021-2030 to result in no net emissions from the accounted scope of the regulation. Its scope covers all managed land, including forest, cropland, grassland and (by 2026) wetland. It simplifies and upgrades the accounting methodology under the Kyoto Protocol and Decision No 529/2013/EU. It also establishes a new EU governance process for monitoring how Member States calculate emissions and removals from activity in their forests.

At present, the EU's land stores more emissions than it emits and the LULUCF Regulation focuses on creating incentives at least to preserve this situation. It requires each Member State

¹⁶ Regulation (EU) 2018/841 of the European Parliament and of the Council on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision 529/2013/EU (OJ L 156, 19.6.2018, p. 1).

to ensure that accounted emissions from land use are entirely compensated by an equivalent removal of CO₂ from the atmosphere through action in the sector. This ‘no-debit rule’ means that Member States have to offset emissions from deforestation, for instance by equivalent carbon sinks from afforestation or improving the sustainable management of existing forests. The rules allow Member States some flexibility, e.g. if a Member State has net removals from land use and forestry, it will be able to transfer those quantities to other Member States to help them meet the ‘no-debit-rule’. Similarly, Member States can compensate any shortfall in the LULUCF sector with AEAAs they receive under the ESR.

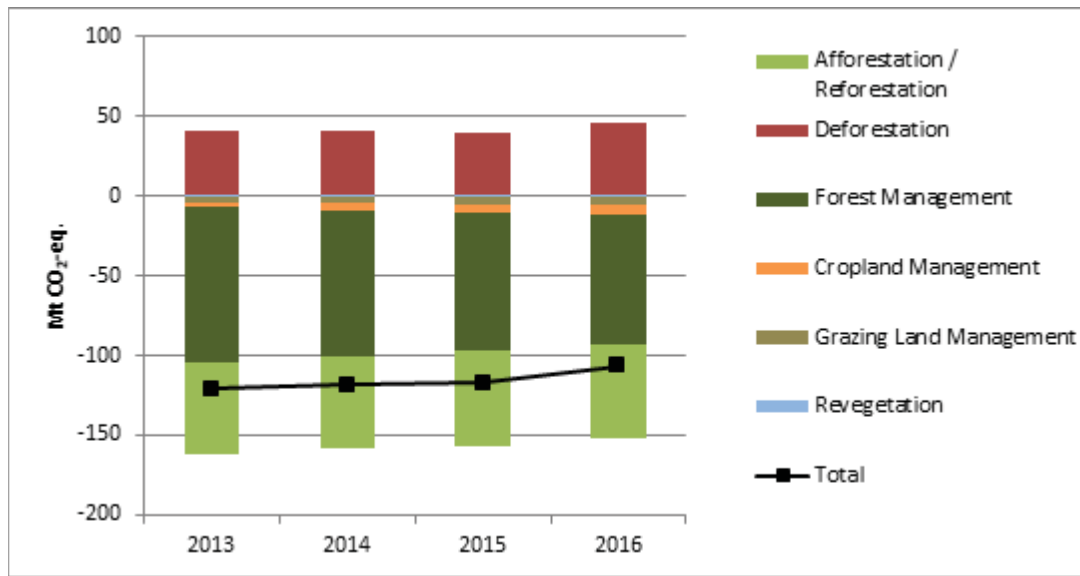


Figure 7: Preliminary accounted emissions and removals for activities reported under the Kyoto Protocol, second commitment period, EU-28. (Forest Management credits are capped and presented as yearly averages when the total Forest Management credits of the considered period exceed the simulated cap over the same period.)

Member States had already partly undertaken this commitment individually for the second commitment period under the Kyoto Protocol (2013-2020). The EU’s ‘**reported**’ quantities under the Protocol for 2013-2016 (i.e. total of emissions and removals for each activity) produce an annual average sink of -384.4 Mt CO₂-eq. Its ‘**accounted**’ debits and credits per activity for the same period produce an average sink of -115.7 Mt CO₂-eq.¹⁷ Reported net removals fell from -394.4 to -366.4 Mt CO₂-eq. and accounted net credits from -120.9 to -106.5 Mt CO₂-eq. These quantities for the EU include ‘elected activities’ under the KP: seven Member States chose cropland management, six chose grazing land management, one chose revegetation and one chose wetland drainage and rewetting, but has yet to provide quantifications.

There are noticeable patterns in GHG inventories and their accounts at Member State level, although these are preliminary and are adjusted at the end of the accounting period in 2020 under LULUCF rules. Denmark and Ireland show net reported emissions, mainly as a result of high emissions from cropland management (Denmark) and grazing land management

¹⁷ The differences between ‘reported’ emissions and removals and ‘accounted’ debits and credits under the Kyoto Protocol are explained in the Staff Working Document accompanying the report.

(Ireland). Under accounting rules for the Kyoto Protocol second commitment period, Belgium, Bulgaria, Cyprus, Finland, Latvia and the Netherlands show net debits in this preliminary accounting exercise. Croatia, Estonia, Germany and Lithuania show increasing credits, while we see decreases for Greece and Portugal. Belgium, Bulgaria and Finland have decreasing debits. No particular trends emerge for Austria, the Netherlands, Romania, Slovakia and Slovenia. Trend reversals, with first increasing and then decreasing credits, are shown for Denmark, France, Hungary, Italy, Spain, Sweden and the United Kingdom. Ireland and Luxembourg show first decreasing and then increasing trends in credits. Other countries show more variable account results with likely artefacts related to the continuous development (or even application) of Kyoto Protocol accounting methods.¹⁸

While some generic factors or trends can be discerned at EU level – for example, continuing decrease of soil organic carbon from cropped land – it is in essence only now that the inventories and accounts can start to be used to examine causal relationships with the LULUCF policies proposed at the start of the period. In particular, some estimation methods will need updating, following the systems and estimates review process that is ongoing under Decision 529/2013.

5 Developing EU legislation

Over the last year, the EU has taken several legislative steps that will help to cut its GHG emissions. In addition to the revision of the ETS and the new Effort-Sharing and LULUCF Regulations (see sections 2-4), there have been important developments as regards road transport, energy and the governance of the Energy Union.

5.1 Road transport

In the last two years, the Commission has adopted three comprehensive packages of measures on mobility, aiming in particular to reduce emissions from road transport and implement the European strategy for low-emission mobility.¹⁹

The Commission has presented a legislative proposal setting new CO₂ emission standards for **passenger cars and vans**²⁰ in the EU for the period after 2020. By 2025 and 2030 respectively, average emissions from new cars and vans will have to be 15 % and 30 % lower than in 2021.

The Commission has also put forward the first ever standards for CO₂ emissions from new **lorries**,²¹ which by 2025 will have to be on average 15 % lower than in 2019. For 2030, it has proposed an indicative reduction target of at least 30 % from 2019 levels. This initiative

¹⁸ See Staff Working Document (country fact sheets) for data by Member State on reported emissions and removals, and accounted debits and credits from LULUCF.

¹⁹ https://ec.europa.eu/transport/themes/strategies/news/2016-07-20-decarbonisation_en

²⁰ https://ec.europa.eu/clima/policies/transport/vehicles/proposal_en

²¹ https://ec.europa.eu/clima/policies/transport/vehicles/heavy_en

complements the recent Regulation on monitoring and reporting CO₂ emissions and fuel consumption from new heavy-duty vehicles.

In addition, the Commission has put forward a comprehensive action plan for **batteries**,²² enabling a competitive and sustainable battery ‘ecosystem’ in Europe, and an action plan for the trans-European deployment of **alternative fuels infrastructure**.²³

Finally, it has proposed the **revision of three directives**:

- the Eurovignette Directive,²⁴ to promote smarter road-infrastructure charging;
- the Clean Vehicles Directive,²⁵ to promote clean mobility solutions in public procurement tenders; and
- the Combined Transport Directive,²⁶ to promote the combined use of different modes (e.g. trucks and trains) for freight transport.

5.2 Energy efficiency and renewable energy

In June 2018, the Council, the European Parliament and the Commission reached provisional agreement on:

- the **Energy Efficiency Directive** – this sets a new 32.5 % energy efficiency target for the EU for 2030, with a clause for upwards revision by 2023. It also extends the annual energy saving obligation beyond 2020; and
- the **Renewable Energy Directive** – this sets a new, binding, renewable energy target of 32 % for 2030, including a 2023 review clause for upward revision of the EU level target. It also improves the design and stability of support schemes for renewables; delivers real streamlining and reduction of administrative procedures; raises the level of ambition for the transport and heating/cooling sectors; and includes new sustainability criteria for forest biomass, aimed at minimising the risk of using unsustainable feedstock for energy generation in the EU.

The revised **Directive on Energy Performance in Buildings**, adopted in May 2018, includes measures that will accelerate the rate of building renovation towards more energy-efficient systems and improve the energy performance of new buildings, making them smarter.

5.3 Governance of the Energy Union

Also in June 2018, the Council, the European Parliament and the Commission reached provisional agreement on a Regulation on the governance of the Energy Union. The new

²² https://ec.europa.eu/transport/modes/road/news/2018-05-17-europe-on-the-move-3_en

²³ http://europa.eu/rapid/press-release_IP-14-1053_en.htm

²⁴ https://ec.europa.eu/transport/modes/road/news/2017-05-31-europe-on-the-move_en

²⁵ http://europa.eu/rapid/press-release_IP-17-4242_en.htm

²⁶ http://europa.eu/rapid/press-release_IP-17-4242_en.htm

governance system will help to ensure that the EU and the Member States achieve their 2030 goals as regards GHG emission reductions, renewables and energy efficiency.

Member States will prepare national energy and climate plans for 2021-2030 and report on their progress in implementing the plans, mostly every two years, while the Commission will monitor the progress of the EU as a whole. The EU and Member States will also prepare long-term strategies, covering a period of at least 30 years from 2020 onwards.

The Regulation will incorporate the existing EU climate monitoring and reporting mechanism and update it in line with the Paris Agreement transparency requirements.

5.4 F-gas Regulation

The Regulation on F-gases²⁷ provides for an EU-wide HFC phase-down from 2015 and other measures targeting emissions from F-gases, with the aim of cutting emissions by some 80 % by 2030 compared with 2014.

Data for 2016 reported under the Regulation showed that the supply of F-gases decreased by 2 % in terms of climate impact (CO₂-equivalent), but increased by 2 % in terms of mass. There was an over-achievement of 4 % against the maximum allowable supply under the HFC phase-down.²⁸ This reflects a shift towards gases with lower global-warming potential and indicates that the Regulation is proving effective in reducing F-gas emissions.

As regards implementation of the Regulation, in 2017 the Commission adopted reports assessing a 2022 requirement to avoid highly global-warming HFCs in some commercial refrigeration systems²⁹ and assessing the quota allocation method for the phase-down.³⁰

5.5 Circular economy

The transition towards a circular economy offers a clear contribution to the reduction of CO₂ emissions. One of the most recent deliverables of the EU Circular Economy Action Plan³¹, the EU Strategy for Plastics in a Circular Economy³² establishes a framework to improve plastic reuse and recycling and to boost the demand for recycled plastics. This will contribute to curbing CO₂ emissions from plastics production and the incineration of plastic waste.

Furthermore, the implementation of the recently adopted waste legislation has the potential to bring significant reduction of GHG emissions. For instance, it will help to tackle the emissions derived from food waste since the new legislation includes the development of a methodology for measuring food waste.

²⁷ Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006 (OJ L 150, 20.5.2014, p. 195).

²⁸ *Fluorinated greenhouse gases 2017 – data reported by companies on the production, import, export and destruction of fluorinated greenhouse gases in the European Union, 2007-2016*, European Environment Agency.

²⁹ COM(2017) 5230 final of 4 August 2017.

³⁰ COM(2017) 377 final of 13 July 2017.

³¹ COM/2015/0614 final

³² COM/2018/028 final

6 Climate finance

6.1 Revenues from the auctioning of EU ETS allowances

In 2017, Member States earned EUR 5.6 billion from the auctioning of EU ETS allowances, EUR 1.8 billion more than in 2016. Approximately 80 % of the revenues from 2013-2017 were used, or their use is planned, for climate and energy purposes. Member States reported that most of the revenues would be used for domestic and EU purposes.

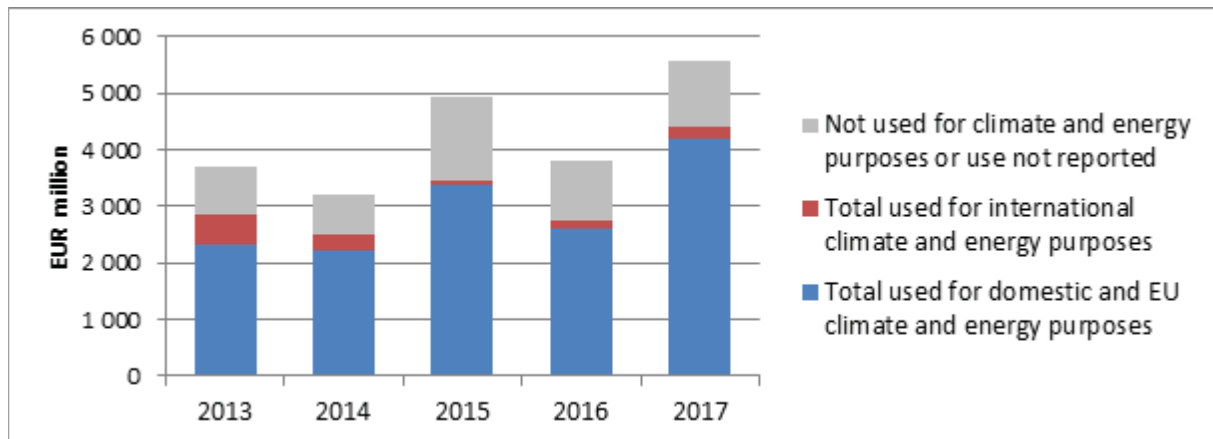


Figure 8: Use of revenues from auctioning of ETS allowances, 2013-2017 (EUR million)

Of revenues used domestically, the biggest amounts were spent on renewable energy, energy efficiency and sustainable transport.

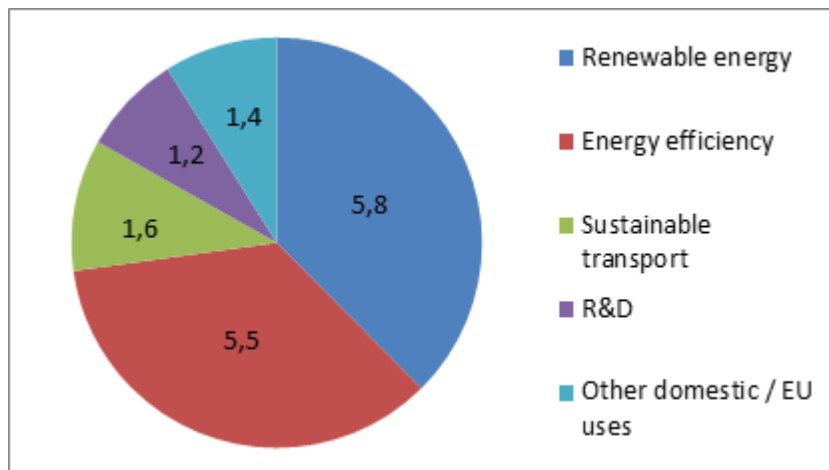


Figure 9: Domestic use of revenues from auctioning of ETS allowances, 2013-2017 (EUR billion)

6.2 LIFE

The LIFE programme is the EU's funding instrument for the environment and climate action; it co-finances projects with European added value. The total budget for funding projects in

2014-2017 amounts to EUR 1.1 billion under the sub-programme for environment and EUR 0.36 billion under the sub-programme for climate action.

LIFE Climate Action supports mitigation and adaptation projects, and climate governance and information. Beneficiaries from 23 Member States have been awarded funding, with Italy and Spain attracting the most.

The LIFE HEROTILE project has developed innovative types of roof tile able to increase their underlay ventilation and thus improve buildings' energy behaviour. Interlocking elements on the terracotta surface allow air in but keep rain out.

Depending on the weather, the added ventilation can reduce the amount of energy needed to keep living spaces fresh and comfortable, in particular in the Mediterranean region where climate change is driving temperatures to new extremes. The carbon footprint of building space cooling is reduced by around 50 % in comparison with a standard pitched roof. The tiles will soon be coming onto the market.

The project has been awarded EUR 1.4 million in EU funding through LIFE.



6.3 NER 300

NER 300 is one of the world's largest funding programmes for innovative low-carbon energy demonstration projects. Some 39 projects in renewable energy and carbon capture and storage in 20 different Member States have been awarded EUR 2.1 billion in funding from the auction of 300 million ETS allowances.

Six projects have gone into operation, while 11 have reached final investment decision stage. The projects in operation represent EUR 2.463 billion of total investments, against NER 300 awards of EUR 260 million. They generate 3.1 TWh eq. of renewable electricity a year, which results in annual savings of 1.3 Mt CO₂.

Following the revision of the EU ETS directive, an Innovation Fund will be created and is planned to start operating in 2020. It will build on experience from the existing NER 300 programme, but will have a broader scope.

Nordsee One is a 332 MW offshore wind project built between December 2015 and December 2017. It is one of the first projects successfully to deploy a 6 MW wind turbine on a giant monopile foundation. The turbines are equipped with various innovative features, including stronger bearings and blades designed to harvest more wind and therefore increase power output. The project is designed to sell power to approximately 400 000 households for at least 25 years.

It has been awarded EUR 70 million NER 300 programme funding.



6.4 Mainstreaming climate policies into the EU budget

The EU set out to spend an average of at least 20 % of its budget on climate-relevant expenditure in 2014-2020. The latest available data show that such expenditure accounted for 20.1 % of the budget in 2017.³³ On average, the budget trend would deliver EUR 206 billion (19.3 % of the budget) under the current multiannual financial framework (MFF).

Building on this success, on 2 May 2018 the Commission proposed a more ambitious target of 25 % of expenditure contributing to climate objectives under the next (2021-2027) MFF.³⁴

³³ SEC(2018) 250; http://ec.europa.eu/budget/biblio/documents/2019/2019_en.cfm

³⁴ https://ec.europa.eu/commission/publications/factsheets-long-term-budget-proposals_en

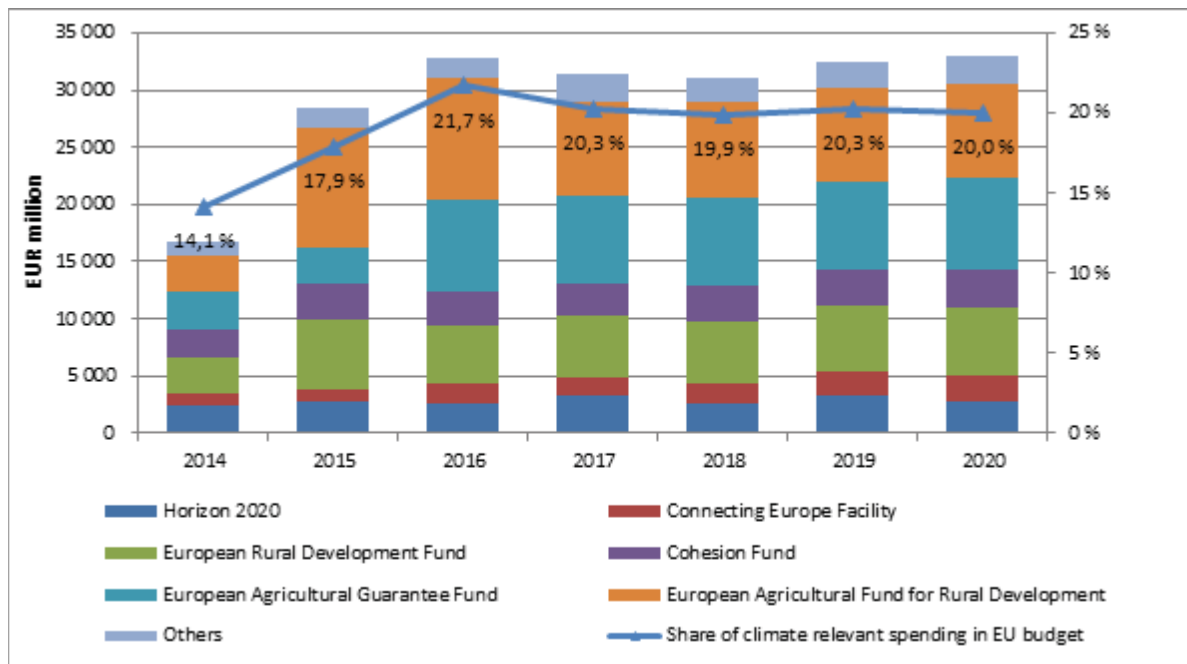


Figure 10: Climate-relevant spending in the EU budget, 2014-2020 (EUR million).

7 Adapting to climate change

Good progress has been achieved in the context of the EU Adaptation Strategy, which was adopted in 2013 to prepare Member States for current and future climate impacts:

- ✓ 25 Member States now have a national adaptation strategy;³⁵
- ✓ climate action has been integrated into EU funding instruments; and
- ✓ adaptation is now also fully integrated into the Covenant of Mayors, with more than 1 000 cities in Europe committed to enhancing their resilience and 40% of cities with more than 150 000 inhabitants having adopted adaptation plans.

The Strategy has undergone thorough evaluation, which concludes that it remains highly relevant and is quite coherent with policies at other levels of governance, although less so as regards international policies. A mix of qualitative and quantitative assessment found that it was effective, although more work needs to be done to:

- implement and monitor national strategies;
- promote local action and ecosystem-based adaptation;
- bridge newly emerging knowledge gaps;
- complete mainstreaming in EU policy, including into disaster risk reduction, trade, maritime, fisheries and public health;
- address territorial and social differences in vulnerability to climate change; and

³⁵ Latvia, Croatia and Bulgaria are still working on their strategies.

- foster the use of insurance and financial instruments in adaptation.

The Strategy seems efficient, involving administrative costs only for the Commission, and it brings clear added value at EU level.

LIFE@Urban Roofs is encouraging real-estate developers and building owners to invest in climate-change adaptation. This new approach sees local government acting as a stimulator and facilitator. The project promotes the use of multifunctional roofs that have greater benefits for property owners than traditional green roofs. These will combine several types of infrastructure: green (to reduce the urban heat-island effect and support biodiversity), blue (water storage), yellow (energy generation) and red (social use).

The project has been awarded EUR 3.3 million EU funding through LIFE.



8 International climate cooperation

8.1 Global action

In the Paris Agreement, countries made mitigation pledges (‘nationally determined contributions’ – NDCs) for the period to 2030. Achieving the targets of the NDCs³⁶ would lead to global emissions peaking at 51 Gt CO₂-eq. per year (53 Gt CO₂-eq. excluding sinks) as early as 2025, while leading to a temperature rise of around 3 °C.³⁷

While the EU has set its 2030 targets in line with a 2 °C pathway and will probably continue to have the lowest GHG emission intensity per GDP among the G20 countries by 2030,³⁸ accelerated decarbonisation is required from other countries, in particular major economies whose GHG emissions continue to rise, to actually limit the temperature increase to well below 2 °C (or 1.5 °C).

The first milestone for climate action is the 2020 deadline for achieving the ‘Cancún pledges’ (from the 2010 Cancún Climate Conference). According to UNEP’s *Emissions gap*

³⁶ Includes conditional and unconditional pledges and achievement of the US NDC.

³⁷ European Commission, Joint Research Centre;
[http://publications.jrc.ec.europa.eu/repository/bitstream/JRC107944/kjna28798enn\(1\).pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/JRC107944/kjna28798enn(1).pdf)

³⁸ *Emissions gap report 2016: a UNEP synthesis report*;
<https://europa.eu/capacity4dev/unep/document/emissions-gap-report-2016-unep-synthesis-report>

report 2017,³⁹ G20 countries (which generate around three quarters of global GHG emissions) are on track collectively to reach the mid-range of these pledges. The EU is on track to meet its pledge without any international offsets, along with China, India and Japan. Australia, Brazil and Russia are also on track, according to most estimates.

Individual pledges represent very different levels of mitigation effort.⁴⁰ Using a more comparative metric, the EU was the least emission-intensive G20 economy in 2012, when it emitted 0.26 t CO₂-eq. per USD 1 000.⁴¹

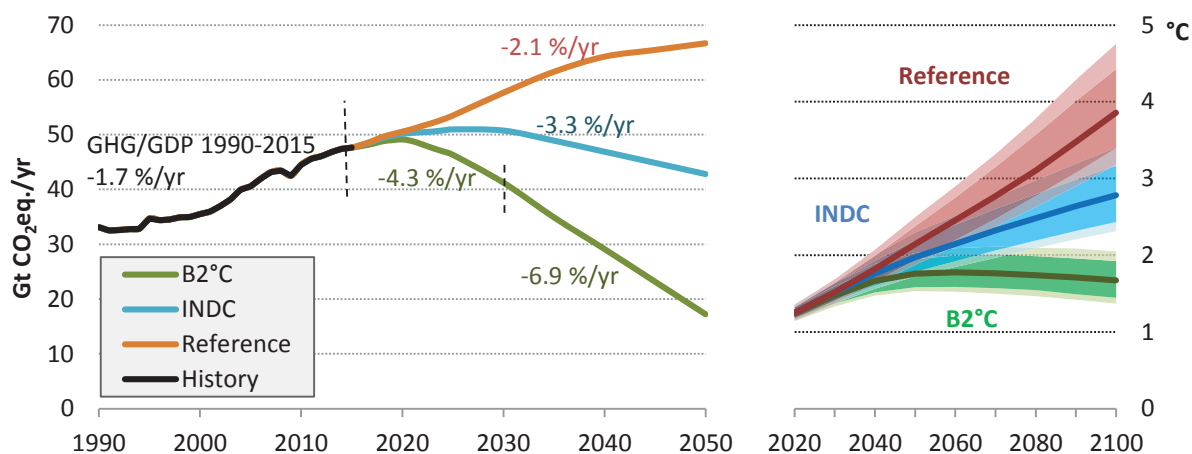


Figure 11: World emissions (Gt CO₂-eq.) and percentage change in emissions intensity per unit of GDP (lhs). Global average temperature change (rhs).⁴²

8.2 Aviation

In June 2018, with support from all EU Member States represented, the International Civil Aviation Organisation (ICAO) Council adopted standards and recommended practices as part of its carbon offsetting and reduction scheme for international aviation (CORSIA). The objective of CORSIA is to stabilise international aviation emissions at 2020 levels. Participation is voluntary for the first six years. The EU and its Member States continue to participate in the ICAO work to make the scheme fully operational.

Since 2012, the EU has tackled aviation emissions through the EU ETS. Given the outcome of the 2016 ICAO Assembly on CORSIA, it decided to extend the temporary scope reduction

³⁹ <https://wedocs.unep.org/handle/20.500.11822/22070>

⁴⁰ The EU's target reduction is 20 % from 1990 levels, Japan's is 3.8 % from 2005 levels, China's pledge involves a 40-45 % reduction in CO₂ intensity by 2020 and increases in forest stock and the proportion of non-fossil sources in primary energy consumption, and India's a 20-25 % reduction in emissions intensity (excluding agriculture) compared with 2005.

⁴¹ Emission database for global atmospheric research (EDGAR); <http://edgar.jrc.ec.europa.eu/overview.php?v=CO2andGHG1970-2016&dst=GHGgdp&sort=des9>

⁴² The analysis was based on the indicative nationally determined contributions (INDCs), now NDCs. Source: Kitous, A., Keramidas, K., Vandyck, T., Saveyn, B., Van Dingenen, R., Spadaro, J., Holland, M., Global Energy and Climate Outlook 2017: How climate policies improve air quality - Global energy trends and ancillary benefits of the Paris Agreement, EUR 28798 EN, Publications Office of the European Union, Luxembourg, 2017

of the EU ETS for aviation until the end of 2023⁴³ and to prepare to implement a global market-based measure from 2021.

ETS emissions from aircraft operators amounted to 64.2 Mt CO₂-eq. in 2017. Based on a comparative calculation, aviation emissions in 2017 were 4.5 % higher than in 2016. This includes more than 250 commercial aircraft companies that were based outside the EU but operated flights within the European Economic Area.

The EU ETS currently only applies to intra-EEA flights, in respect of which aviation's overall impact on the global climate, including through non-CO₂ emissions or effects, is considerably higher than the CO₂ component alone. It has been estimated that the non-CO₂ radiative forcing effects were 2-4 times those of CO₂, which gives a range of 120-250 million tonnes CO₂-equivalent for aviation's total impacts from intra-EEA activities⁴⁴. This leaves aside cirrus related effects, but these are considered to be lower in respect of short haul flights which are common for flights within the EEA.

Total emissions from aviation represented approximately 4 % of all EU GHG emissions in 2017 and have almost doubled since 1990. Most come from international aviation (including intra-EEA flights).

8.3 Maritime policy

In April 2018, the International Maritime Organisation (IMO) agreed an initial strategy to reduce GHG emissions from international shipping. This contains a reduction objective of at least 50 % by 2050, compared with 2008 levels, with a view to full decarbonisation of the sector as soon as possible in this century. It also includes a comprehensive list of possible reduction measures, including short-term measures. However, an action plan still needs to be agreed to ensure delivery of the strategy.

At EU level, the first obligations as regards monitoring and reporting shipping emissions on the basis of the MRV Shipping Regulation⁴⁵ took effect on 31 August 2017, when monitoring plans were due to be completed and submitted to verifiers. Emissions monitoring and reporting on the basis of the plans started in January 2018. The Commission is currently working on an amendment to align the Regulation with the data collection system agreed by the IMO in 2017.

8.4 ETS-linking with Switzerland

In November 2017, the EU and Switzerland signed an agreement to link their emissions trading systems – the first such agreement between two parties to the Paris Agreement. The

⁴³ Regulation (EU) 2017/2392 of the European Parliament and the Council of 13 December 2017 amending Directive 2003/87/EC to continue current limitations of scope for aviation activities and to prepare to implement a global market-based measure from 2021 (OJ L 350, 29.12.2017, p. 7).

⁴⁴ Directive 2008/101/EC, recital 19, at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0101>

⁴⁵ Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC (OJ L 123, 19.5.2015, p. 55).

parties will exchange their instruments of ratification once all the conditions for linking are met and the agreement will enter into force on 1 January of the following year.

8.5 International carbon markets

The EU is actively participating in UN Framework Convention on Climate Change (UNFCCC) negotiations on the aspects of the ‘Paris rule book’ relating to international cooperation on markets. It has a continuing interest in securing implementation of a robust set of accounting rules and an ambitious market mechanism to prevent current efforts being undermined by double counting and promote broader, more ambitious action.

The Commission is stepping up its cooperation with the Chinese authorities on emission trading and carbon markets, with a view to helping them set up a well-functioning emissions trading system at national level. A memorandum of understanding signed at the EU-China Summit in July 2018 will form a solid basis for further such cooperation. A new project will help to build up emissions trading capacities in China.

The Commission is also supporting the bottom-up development of robust carbon market instruments. The Florence Process brings together policymakers (from California, Canada, China, the EU and New Zealand), academics and NGO representatives to learn from each other and cooperate more closely to build robust carbon markets. Other initiatives in this area include the Partnership for Market Readiness (PMR) and the International Carbon Action Partnership (ICAP).

8.6 Voluntary action – Marrakesh Partnership on Global Climate Action

In response to the Paris Agreement call to mobilise non-state actors (business, cities, citizens, international civil society, etc.), the EU is supporting a number of flagship initiatives such as Mission Innovation, the Global Covenant of Mayors on Climate and Energy (through the Regional Covenants), the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP/One Planet network), the Partnership for Action on the Green Economy (PAGE), the NDC Partnership, Renewable Energy for Africa, 4/1000 for Climate Smart Agriculture and InsuResilience. Systematic tracking tools are being devised to measure their impact on emissions reductions and resilience. Globally these efforts are organised under the Marrakesh Partnership on Global Climate Action.

The *Yearbook of Global Climate Action*⁴⁶ and UNEP’s *Emissions gap report 2017* show that global climate action could deliver additional emissions reductions (compared with the NDCs) of 1.6-4 Gt CO₂ annually in 2020, increasing to 5-10 Gt CO₂ by 2030, which would contribute significantly to closing the gap. Looking at transnational initiatives only, Roelfsema *et al.* (2017)⁴⁷ identify an additional global impact of 1-3 Gt CO₂-eq. in 2030.

⁴⁶ unfccc.int/tools/GCA_Yearbook/GCA_Yearbook2017.pdf

⁴⁷ <https://doi.org/10.1016/j.gloenvcha.2017.11.001>

Europe is one of the most developed regions in terms of registered non-state climate action: of the cooperative initiatives registered on the UNFCCC NAZCA platform (Non-state Actor Zone for Climate Action – an online portal to visualize collective action), 54% are European.

Since 2017, the Covenant of Mayors in Europe has been a member of the Global Covenant of Mayors for Climate and Energy, which brings together the world's two main initiatives of cities and local governments (the Covenant of Mayors and the Compact of Mayors) to advance their transition to low-emission and climate-resilient cities, which also brings benefits to the overall economy and has a global impact.

8.7 Supporting developing countries

The EU and its Member States are the world's biggest providers of official development assistance to developing countries, delivering EUR 75.74 billion in 2017. In particular, the support provided by the EU, the European Investment Bank (EIB) and the Member States to help developing countries tackle climate change has almost doubled in nominal terms since 2013. The EU and its Member States are the largest contributors to the Green Climate Fund (GCF) with a total of USD 4.7 billion committed, accounting for almost half of the USD 10.3 billion of total pledges during the initial resource mobilisation.

In 2017, the EU and the African Union (AU) launched the **AU-EU Research and Innovation Partnership on Climate Change and Sustainable Energy**, which is built around three main areas of cooperation: climate services, renewable energy and energy efficiency.

The EU is financing many programmes and initiatives that focus on adaptation and mitigation, in particular the needs of the most vulnerable developing countries. New developments in the past year have included the launch of the EU **External Investment Plan**, which encourages investment in developing countries in Africa and the EU Neighbourhood region and is tailored to the specific needs of developing countries. The EU **Electrification Financing Initiative** (EUR 115 million) aims to support investments that increase and improve access to modern, affordable and sustainable energy services.

The **Global Climate Change Alliance Plus** is an EU climate flagship initiative. One key priority is to support the formulation and implementation of concrete, integrated sectoral climate-change adaptation and mitigation strategies. In 2015-2017, it provided around EUR 100 million, *inter alia* through a multi-country programme for the Pacific islands, to support 13 countries in their climate adaptation efforts.

In 2018, the EU launched a new EUR 20 million programme to support its **strategic partnerships** for the implementation of the Paris Agreement in major economies (mainly non-European members of the G20 and Iran).