

EU Emissions Trading System (EU ETS)

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Member states: 27 EU Member States and three European Economic Area-European Free Trade Association (EEA-EFTA) states: Iceland, Liechtenstein and Norway</p> <p>The European Union Emissions Trading System (EU ETS) is a cornerstone of the EU's policy to combat climate change and a key tool for reducing, on a cost-effective basis, GHG emissions from the regulated sectors. The system covers ~40% of the EU's emissions, from the power sector, manufacturing industry, and aviation within the European Economic Area. It is the oldest and now second-largest ETS in force. Introduced in 2005 and now in its fourth trading phase, the EU ETS has gone through several reforms. The latest reform of the ETS was proposed in July of 2021 as a part of the European Green Deal. As of January 2020, the EU ETS became linked to the Swiss ETS, the first linking of this kind for both parties.</p>
Year in Review	<p>In July 2021, the European Commission released the "Fit for 55" package – a sweeping set of policy proposals spanning all major sectors of the economy to achieve emission reductions of at least 55% below 1990 levels. The package places the EU ETS at the heart of the EU's decarbonization agenda with major changes that include: a one-off reduction to the cap and increased linear reduction factor (from 2.2% to 4.2%); the inclusion of the maritime sector into the EU ETS' scope from 2023 onwards; a separate fuel ETS for buildings and transport; strengthened benchmarks and a faster phase down of free allocation which would be tied to low-carbon investment by the receiving entity; the introduction of a carbon border adjustment mechanism (CBAM) that prices imported goods based on their embedded emissions to become fully operational by 2026; updated parameters of the Market Stability Reserve (MSR) including a new buffer threshold and an extension of the current intake rate of 24% beyond 2023; and new regulations around revenue use to address distributional effects and spur innovation, including the creation of the Social Climate Fund.</p> <p>The package has yet to go through the EU's ordinary legislative procedure before entering effect in its final form in the coming years, a process requiring approval — likely with some amendments — by the Council of the EU and the European Parliament. It comes less than a year after the European Commission launched its revision process for the system as part of the 2030 Climate Plan under the European Green Deal. The widely anticipated reforms supported allowance demand even last year as emissions declined amidst the height of the COVID-19 pandemic. Meanwhile, the MSR absorbed a total of 773 million allowances through reduced auction volumes in 2019 and 2020.</p> <p>2020 also saw the finalization of regulatory preparations ahead of Phase 4 (2021-2030) which took effect this year. On the international front, The UK formally withdrew from the EU on 31 January 2020 but continued to participate in the EU ETS until the end of the year as part of the transition period. In parallel, the linking agreement between the EU ETS and the Swiss ETS entered into force in January 2020. A provisional link was established in September, enabling allowance transfers between both registries on pre-announced dates.</p>
Overall GHG emissions (excluding LULUCF)	Emissions: 3,893.1 MtCO ₂ e (2018*)

	*Overall GHG emissions for the EU-27 that comprises all European Member States, which as of 2021 no longer includes the United Kingdom.	
Overall GHG emissions by sector (in MtCO ₂)	<div>Sector Name</div> <div>Energy (2,907.1)</div> <div>Industrial Processes (343.5)</div> <div>Agriculture (394.4)</div> <div>Waste (117.2)</div> <div>International Aviation (129.2)</div>	<div>MtCO₂e</div> <div>2907.1</div> <div>343.5</div> <div>394.4</div> <div>117.2</div> <div>129.2</div>
GHG reduction target	<p>By 2030: At least 55% below 1990 GHG levels proposed (European Green Deal), to be set in the Climate Law</p> <p>By 2050: Climate neutrality target proposed (European Green Deal), to be set in the Climate Law*</p> <p>*Both updated targets (2030 and 2050) recently have been endorsed by the European Parliament and European Council, and are currently in the process of being enshrined into the European Climate Law.</p>	
Carbon Price	Current Allowance Price (per t/CO ₂ e): EUR 24.76 (USD 28.28) (average 2020 secondary market spot price from EEX exchange; updated prices available here)	

ETS Size

Covered emissions	0.39
GHGs covered	CO ₂ , N ₂ O, PFCs
Sectors and thresholds	<p>PHASE ONE (2005-2007): Power stations and other combustion installations with >20MW thermal rated input (except hazardous or municipal waste installations), industry (various thresholds) including oil refineries, coke ovens, and iron and steel plants, as well as production of cement, glass, lime, bricks, ceramics, pulp, paper, and cardboard.</p> <p>PHASE TWO (2008-2012): Aviation was introduced in 2012 (>10,000 tCO₂/year for commercial aviation; >1,000 tCO₂/year for non-commercial aviation since 2013) (see "Aviation" section). A number of countries included NO_x emissions from the production of nitric acid. The EU ETS also expanded to include Iceland, Liechtenstein, and Norway.</p> <p>PHASE THREE (2013-2020): Carbon capture and storage installations, production of petrochemicals, ammonia, nonferrous and ferrous metals, gypsum, aluminum, as well as nitric, adipic, and glyoxylic acid (various thresholds) were included.</p> <p>PHASE FOUR (2021-2030): Based on the current legislation, no changes to the scope have been agreed on for Phase 4. Changes are being considered as part of the review of the ETS foreseen under the 2030 Climate Target Plan (see "Year in Review" section).</p> <p>Aviation: Emissions from international aviation were included in the EU ETS in 2012. In November 2012, the EU temporarily suspended enforcement of the EU ETS requirements for flights operating from or to non-EEA countries ("stop the clock") while continuing to apply the legislation to flights within and between countries in the EEA. Exemptions for operators with low emissions have also been introduced.</p> <p>In light of the progress made under the International Civil Aviation Organization (ICAO) towards a global measure to reduce emissions from the aviation sector (the Carbon Offsetting and Reduction Scheme [CORSIA]), the EU will maintain the intra-EEA scope for the ETS Aviation until 31 December 2023. In 2020, the Commission initiated a process to revise the ETS Directive to address the implementation of CORSIA in EU law in a way that is consistent with the EU's 2030 climate target, with a view of adoption in 2021.</p>
Point of regulation	Downstream
Number of entities	10,569 power plants and manufacturing installations.

Cap	<p>PHASE ONE (2005-2008) and PHASE TWO (2009-2012): The cap was established bottom-up, based on the aggregation of the national allocation plans of each Member State. Phase 1 started with a cap of 2,096 MtCO₂e in 2005; Phase 2 started with a cap of 2,049 MtCO₂e in 2009.</p> <p>PHASE THREE (2013-2020): A single EU-wide cap for stationary sources: 2,084 MtCO₂e in 2013, which is annually reduced by a linear reduction factor (currently 1.74% or ~38.3 million allowances). This amounts to a cap of 1,816 MtCO₂e in 2020.</p> <p>PHASE FOUR (2021-2030): A single EU-wide cap for stationary installations set for 2021 at 1,572 MtCO₂e. A linear cap reduction factor of 2.2% (of 2008-2012 baseline emissions) applies to both stationary sources and the aviation sector each year. This translates into a year-on-year reduction of the cap by 43 million allowances. The linear reduction factor does not have a sunset clause and the cap will continue to decline beyond 2030. Starting 2021, emissions from UK entities previously covered by the EU ETS are no longer considered in the cap. However, pursuant to Article 9 and Annex 4 of the Protocol on Ireland/Northern Ireland, the cap trajectory in Phase 4 does account for emissions from electricity generators in Northern Ireland.</p> <p>Aviation Sector Cap: Emissions for intra-EEA aviation in 2021 are capped at 38 million allowances and will decrease each year by the linear reduction factor of 2.2%. The aviation sector cap was set in 2012 at 210 MtCO₂e/year. This cap was meant to reflect the initial inclusion of all flights from, to, and within the EEA in the EU ETS. However, following the “stop the clock” temporary suspension until the end of 2016, the number of aviation allowances put into circulation in 2013-2016 was reduced to 38 million allowances annually and set considerably below verified intra-EEA aviation emissions. In 2017, the intra-EEA scope for aviation was prolonged until 2023. The adjusted annual aviation cap applies up to 2021 and decreases thereafter.</p>
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Phases & Allocation

Trading periods	<p>Phase 1: 3 years (2005-2007)</p> <p>Phase 2: 5 years (2008-2012)</p> <p>Phase 3: 8 years (2013-2020)</p> <p>Phase 4: 10 years (2021-2030)</p>
Allocation	<p>PHASE ONE (2005-2007): Allocation established through the Member State national allocation plans. Allocation through grandfathering. Some Member States used auctioning and some used benchmark-based allocation.</p> <p>PHASE TWO (2008-2012): Similar to Phase 1, with ~90% of allowances allocated for free. Some benchmark-based free allocation; and some auctioning in eight Member States (Germany, United Kingdom, The Netherlands, Austria, Ireland, Hungary, Czech Republic, and Lithuania), amounting to ~3% of total allowance allocation.</p> <p>PHASE THREE (2013-2020): 57% of allowances auctioned over the entire trading period with the remaining allowances allocated through benchmarking. 88% of the auctioned allowances were distributed to EU Member States based on verified 2005 or average 2005-2007 emissions.</p> <p>10% was allocated to lower-income EU Member States and the remaining 2% distributed among nine Member States that reduced 2005 emissions by 20% compared to the base year.</p> <p>Power Sector: 100% auctioning with an optional derogation for the modernization of the electricity sector in certain Member States whose GDP per capita was below 60% of the EU average in 2013.</p> <p>Manufacturing/Industry: Free allocation follows product-based benchmarks. Benchmarks were based on activity levels in 2007-2008 and were set at the average of the 10% most efficient installations in the (sub)sector.</p> <p>Subsectors deemed at risk of carbon leakage received free allocation at 100% of the predetermined benchmarks. Subsectors deemed not at risk of carbon leakage had free</p>

allocation phased out gradually from 80% of the respective benchmarks in 2013 to 30% by 2020. Where free allocation exceeded the amount reserved for free allocation, a cross-sectoral correction factor applied.

Carbon leakage risk was assessed against the following criteria of emissions intensity and trade exposure:

- direct and indirect cost increase >30%; or
- non-EU trade intensity >30%; or
- direct and indirect cost increase >5% and trade intensity >10%.

Cost intensity was determined by the formula

$$[\text{Carbon price} \times (\text{direct emissions} \times \text{auctioning factor} + \text{electricity consumption} \times \text{electricity emission factor})] / \text{GVA}$$

Trade intensity was determined by the formula

$$(\text{imports} + \text{exports}) / (\text{imports} + \text{production})$$

Aviation Sector: In 2012, 85% of allowances were allocated for free, based on benchmarks. In Phase 3 (2013-2020), 15% of allowances were auctioned and 82% allocated for free, based on benchmarks. The remaining 3% constituted a special reserve for new entrants and fast-growing airlines. Due to the temporary derogation that applied to flights with third countries, the allocation was adjusted to the intra-EEA scope.

Back-loading: As a short-term measure to address a growing surplus in the EU ETS, the auctioning of 900 million allowances from 2014-2016 was postponed to 2019-2020. In line with the decision to create the market stability reserve, the back-loaded allowances were placed in the MSR, which became operational in 2019.

New Entrants Reserve: 5% of the total allowances are set aside to assist new installations coming into the EU ETS or to cover installations whose capacity has significantly increased since their free allocation was determined. Until June 2020, a total of 171.1 million allowances were reserved for 1,089 installations during Phase 3. At the end of Phase 3, any unallocated allowances (excluding 200 million reserved for the NER300* in Phase 4) were placed into the MSR.

PHASE FOUR (2021-2030):

Manufacturing/Industry: Benchmark values are updated twice to reflect technological progress in different sectors. The first set of benchmark values applies to the period 2021-2025; the second set of values will cover the period from 2026 to 2030. Member States submitted lists of incumbent installations and updated emissions data by 30 September 2019 and are required to do so again by 30 September 2024. Based on this data, the European Commission will update Phase 3 benchmarks.

- Benchmark values in Phase 4 will be adjusted for technological progress year-on-year. An annual reduction rate (0.2% to 1.6%) will be determined for each benchmark. For the steel sector, which faces high abatement costs and leakage risks, the lower end of 0.2% annual benchmark reduction will apply. Further updates on the above may be released as part of the broader ETS review.
- Free allocation may be updated annually to mirror sustained changes in production (if the change is more than 15% compared to the initial level, based on a 2-year rolling average).

Carbon leakage rules:

- The third carbon leakage list adopted in February 2019 applies for the period 2021-2030. The revised list includes a reduced number of sectors classified at risk of carbon leakage. Free allocation for other sectors will be discontinued by 2030 (except district heating).
 - Carbon leakage is assessed against a composite indicator of trade intensity and emissions intensity.
 - As an additional safeguard for industry, the Phase 4 cap breakdown includes a free allocation buffer of more than 450 million allowances, initially earmarked for auctioning, which can be made available for free allocation if the initial free allocation volume is fully absorbed (thereby avoiding the need to apply the cross-sector correction factor).
- Carbon leakage risk is assessed according to the following criteria:

- Trade Intensity x Emissions Intensity > 0.2
- Trade intensity x Emissions Intensity > 0.15 < 0.2; qualitative assessment will follow based on abatement potential, market characteristics, and profit margins.

Emissions intensity is determined by:

$$[\text{direct emissions} + (\text{electricity consumption} \times \text{electricity emission factor})] / \text{GVA}$$

Trade exposure is determined by:
 $(imports + exports) / (imports + production)$

Power Sector: 100% auctioning with an optional derogation for the modernization of the electricity sector in certain Member States. Those Member States whose GDP per capita was below 60% of the EU average in 2013 may continue to make use of this optional free allocation through benchmarking. Three out of ten eligible Member States make use of the derogation in Phase 4 (2021-2030). Some Member States chose to monetize the corresponding share of allowances or use them to boost their share of the Modernization Fund.

Aviation: Free allocation for the aviation sector will be reduced compared to the 82% in Phase 3. A proposal is expected in June 2021.

Auctioning: 57% of allowances in Phase 4 will be auctioned. Out of these, 90% will be distributed to Member States based on their share of verified emissions, with 10% distributed among the lower-income EU Member States. Authorities have the right to cancel auctions when the highest bidding price is significantly below the prevailing secondary market price to avoid market distortion. In such a situation, allowances are transferred to subsequent auctions scheduled at the same trading platform.

NER: The New Entrants Reserve in Phase 4 (2021-30) has been supplied with 200 million from the unallocated NER allowances from Phase 3 (2013-2020).

*The NER 300 is an EU low-carbon technology funding program of approximately EUR 2 billion (USD 2.3 billion) monetized through the sale of 300 million allowances that awarded proposals in 2012 and 2014, the latest of which will enter into operation by June 2021.

Flexibility

Banking and borrowing	<p>Unlimited banking has been allowed since 2008.</p> <p>Borrowing is not allowed. However, implicit borrowing within trading periods is allowed, i.e., the use of allowances allocated in the current year for compliance in the previous year.</p>
Offsets and credits	<p>PHASE ONE (2005-2007): Unlimited use of Clean Development Mechanism (CDM) credits and Joint Implementation (JI) credits was provided for in the directive. In practice, no credits were used in Phase 1.</p> <p>PHASE TWO (2008-2012): Qualitative Limits: Most categories of CDM/JI credits were allowed; no credits from LULUCF and nuclear power sectors were allowed. Strict requirements for large hydro projects exceeding 20 MW.</p> <p>Quantitative Limits: In Phase 2, operators were allowed to use JI and CDM credits up to a certain percentage limit determined in the respective country's National Allocation Plans. Unused entitlements were transferred to Phase 3 (2013-2020).</p> <p>PHASE THREE (2013-2020): Qualitative Limits: Newly generated (post-2012) international credits had to originate from projects in least developed countries. Credits from CDM and JI projects from other countries were eligible only if registered and implemented before 31 December 2012. Projects from industrial gas credits (projects involving the destruction of HFC-23 and N₂O) were excluded regardless of the host country. Credits issued for emission reductions that occurred in the first commitment period of the Kyoto Protocol were no longer accepted after 31 March 2015.</p> <p>Quantitative Limits: The total use of credits for Phase 2 and Phase 3 was capped at 50% of the overall reduction under the EU ETS in that period (~1.6 Gt CO₂e).</p> <p>PHASE FOUR (2021-2030): Based on the current legislation, the use of offsets is not envisaged.</p>

Market Stability Provisions	<p>MARKET STABILITY RESERVE: The MSR started operating in January 2019. Its purpose is to address any supply-demand imbalance of allowances prevailing in the EU carbon market and to improve the EU ETS's resilience to future shocks.</p> <p>Thresholds: The European Commission publishes the total numbers of allowances in circulation (TNAC) by 15 May each year.</p> <ul style="list-style-type: none"> • When the TNAC is above 833 million, 24% (12% beyond 2023) of the surplus is withdrawn from future auctions and placed into the reserve over a period of 12 months. • When the TNAC is less than 400 million allowances, 100 million allowances are taken from the reserve and injected into the market through auctions. <p>From 2023 onwards, the number of allowances held in the reserve will be limited to the auction volume of the previous year. Holdings above that amount will be invalidated. Thresholds, withdrawal rates, and cancellation provisions of the MSR will be reviewed in June 2021.</p> <p>In 2019, a total of 397 million allowances were placed in the reserve. In 2020, the total number of allowances withdrawn amounted to more than 375 million, corresponding to a 35% reduction in auction volumes for that year.</p> <p>Swiss allowance supply is not taken into account when the annual EU withdrawal amount is calculated, and Swiss auction quotas will not be reduced by the mechanism.</p> <p>CANCELLATIONS: As of Phase 4, a Member State may also cancel allowances from their auction share in the event that they take additional policy measures that result in closure of electricity generation capacity. The quantity of allowances cancelled shall not exceed the average verified emissions of the installation from five years preceding the closure.</p>
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Compliance

Compliance Period	One year (1 January to 31 December): every year, operators must submit an emissions report. Data for a given year must be verified by an accredited verifier by 31 March of the following year. Once verified, operators must surrender the equivalent number of allowances by 30 April of that year.
Monitoring, Reporting, Verification (MRV)	<p>REPORTING FREQUENCY: Annual self-reporting based on harmonized electronic templates prepared by the European Commission.</p> <p>VERIFICATION: Verification by independent accredited verifiers is required before 31 March each year.</p> <p>MRV FRAMEWORK: Since Phase 3, the MRV framework for the EU ETS has been further harmonized. European Commission regulations now apply for emissions monitoring and reporting, as well as verification and accreditation of verifiers. A monitoring plan is required for every installation and aircraft operator (approved by a competent authority). MRV procedures were updated in 2020 in preparation for Phase 4.</p>
Enforcement	Regulated entities must pay an excess emissions penalty of EUR 100/tCO ₂ (USD 114.22/tCO ₂) for each tonne of CO ₂ emitted for which no allowance has been surrendered, in addition to buying and surrendering the equivalent amount of allowances. The name of the non-compliant operator is also made public. Member States may enforce different penalties for other forms of noncompliance.

Linking

Links with other systems	<p>Following final regulatory changes in the design of the Swiss ETS, a link between the Swiss ETS and the EU ETS took effect on 1 January 2020. The link allows covered entities in both systems to use allowances from either ETS for compliance. A provisional link was implemented in September the same year, enabling the transfer of allowances between registries on pre-announced dates. This system is set to be replaced with an electronic link that would facilitate transfers of emission allowances between both ETS registries on a continuous basis.</p> <p>The link caps a ten-year process of reaching an agreement on regulatory alignment. Formal negotiations began in December 2010, culminating in the conclusion of a linking</p>
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agreement in late 2017*. Both sides announced on 12 December 2019 that the link would become operational in January 2020.

*Agreement between the European Union and the Swiss Confederation on the linking of their GHG emissions trading systems, OJ L 322, 12 December 2017, p. 3.

Other Information

Institutions involved	The European Commission and the relevant authorities of all EU Member States as well as Iceland, Liechtenstein, and Norway.
Evaluation / ETS review	<p>The European Commission publishes annual reports on the functioning of the European carbon market (2020 report).</p> <p>Two major EU ETS reviews—before Phase 3 and before Phase 4—have been conducted to date, introducing changes to the system’s operational framework. The ETS Directive stipulates that the system be kept under review in light of the implementation of the Paris Agreement and the development of carbon markets in other major economies.</p>
Revenue	<p>Since beginning of program: EUR 69.7 billion (USD 80.7 billion) Collected in 2020: EUR 19.2 billion (USD 21.8 billion)</p> <p>In the EU ETS, revenues from the auctioning of allowances accrue to Member States. At least 50% of revenues should be used for climate- and energy-related purposes. Member States are obliged to inform the European Commission about how they use the revenues. In 2019, on average, Member States spent ~77% of their revenues on domestic and international climate-related purposes.</p> <p>PHASE FOUR (2021-2030): The latest revision of the EU ETS set up two new funds to support EU stakeholders in the low-carbon investment challenge.</p> <ul style="list-style-type: none"> • Innovation Fund: Supports demonstration of innovative breakthrough technologies in industry, as well as carbon capture and storage/use and renewable energy. The fund is monetized through the sale of at least 450 million allowances, and the remaining budget from the NER300. In 2020, the first batch of 50 million allowances was auctioned to capitalize the Fund. • Modernisation Fund: Supports investments in modernizing energy systems and improving energy efficiency in 10 lower-income Member States, including investments to support a socially just transition to a low-carbon economy (e.g., upskilling/reskilling of affected workers). The Modernisation Fund is capitalized with the auction revenues of 2% of total allowances for Phase 4. Subject to the allowance price, up to EUR 14 billion (USD 16 billion) may be injected into the Fund over 2021-2030.
Implementing Legislation	<p>Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for GHG emission allowance trading within the Community and amending Council Directive 96/61/EC.</p> <p>Decision concerning the establishment and operation of a market stability reserve for the Union GHG emission trading scheme and amending Directive 2003/87/EC (6 October 2015).</p> <p>Consolidated Auctioning Regulation (25 February 2014): Commission Regulation EU No 176/2014 amending Regulation (EU) No 1031/2010 in particular to determine the volumes of GHG emission allowances to be auctioned in 2013-2020 (26 February 2014).</p> <p>All other legislation and documentation can be found here.</p>

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