



# The EU Emissions Trading System (EU ETS)

- The EU ETS is the cornerstone of the European Union's drive to reduce its emissions of man-made greenhouse gases which are largely responsible for warming the planet and causing climate change.
- The system works by putting a limit on overall emissions from covered installations which is reduced each year. Within this limit, companies can buy and sell emission allowances as needed. This 'cap-and-trade' approach gives companies the flexibility they need to cut their emissions in the most cost-effective way.
- The EU ETS covers approximately 11,000 power stations and manufacturing plants in the 28 EU Member States plus Iceland, Liechtenstein and Norway, as well as aviation activities in these countries. In total, around 45% of total EU greenhouse gas emissions are regulated by the EU ETS.
- The EU ETS remains the world's biggest emissions trading market, accounting for over three-quarters of international carbon trading. It continues to inspire the development of other national or regional systems. Europe is looking to link the EU ETS with compatible schemes in other countries.
- The European Commission presented in July 2015 a legislative proposal on the revision of the EU ETS for its next phase (2021-2030), in line with the EU's 2030 climate and energy policy framework. The proposal aims to reduce EU ETS emissions by 43% compared to 2005.

Emissions trading systems are among the most cost-effective tools for cutting greenhouse gas emissions. In contrast to traditional 'command and control' regulation, trading harnesses market forces to find the cheapest ways to reduce emissions.

The European Union launched the EU Emissions Trading System (EU ETS) in 2005 as the cornerstone of its strategy for cutting emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases at least cost. The EU ETS is the world's first major carbon market and remains by far the biggest today.

By putting a price on carbon and thereby giving a financial value to each tonne of emissions saved, the EU ETS has placed climate change on the agenda of company boards across Europe. Pricing carbon also promotes investment in clean, low-carbon technologies.

By allowing companies to buy credits from emission-saving projects around the world, in particular in least developed countries, the EU ETS acts as a driver of investment in clean technologies and low-carbon solutions globally.

This factsheet explains the EU ETS as it stood in September 2016.

## EU ETS: Key facts

- Operates in the 28 EU countries plus Iceland, Liechtenstein and Norway
- Limits greenhouse gas emissions from:
  - Approximately 11,000 energy intensive installations in power generation and manufacturing industry sectors
  - Operators of flights to and from EU Member States, Iceland, Liechtenstein and Norway (for the time being, only flights within these countries are covered)
- Covers around 45% of the EU's greenhouse gas emissions

## Cutting greenhouse gas emissions: EU targets\*

**2020: -20%**

**2030: -40% (at least)**

\*compared to 1990 levels

## How the EU ETS works

The EU ETS works on the 'cap and trade' principle. The overall volume of greenhouse gases that can be emitted for a multi-year phase by the power plants, factories and other companies covered by the system is subject to a cap set at EU level. Within this cap, companies receive or buy emission allowances which they can trade, if they wish to do so.

In the period 2013-2020, the cap on emissions from power stations and other fixed installations is reduced by 1.74% every year. This means that in 2020, greenhouse gas emissions from these sectors will be 21% lower than

in 2005. A separate cap applies to the aviation sector: for the whole 2013-2020 period, this is 5% below the average annual level of emissions in the years 2004-2006.

Emission allowances are the 'currency' of the EU ETS, and the limit on the total number available gives them a value. Each allowance gives the holder the right to emit one tonne of CO<sub>2</sub>, the main greenhouse gas, or the equivalent amount of two other powerful greenhouse gases, nitrous oxide (N<sub>2</sub>O) and perfluorocarbons (PFCs).

Allowances can be used only once. Companies have to surrender allowances for every tonne of CO<sub>2</sub> (or the equivalent amount of N<sub>2</sub>O or PFCs) covered by the EU ETS that they emitted in the previous year. Heavy fines are imposed if they do not hand in enough allowances to match their emissions.

Companies may receive some allowances from governments for free. To cover the rest of their emissions, they need to do

## EU ETS: Development in phases

**2005-2007: 1st trading period** constituted a process of 'learning by doing.' EU ETS was successfully established as the world's biggest carbon market. However, the number of allowances, based on estimated needs, turned out to be excessive; consequently the price of first-period allowances fell to zero in 2007.

**2008-2012: 2<sup>nd</sup> trading period.** Iceland, Norway and Liechtenstein joined (1.1.2008). The number of allowances was reduced by 6.5% for the period, but the economic downturn depresses emissions, and thus demand, by even more. This led to a surplus of unused allowances and credits which continues to weigh on the carbon price. Aviation was brought into the system (1.1.2012).

**2013-2020: 3<sup>rd</sup> trading period.** Major reform took effect (1.1.2013). The biggest changes have been the introduction of an EU-wide cap on emissions (reduced by 1.74% each year) and a progressive shift towards auctioning of allowances in place of cost-free allocation. Croatia joined the ETS (1.1.2013).

**2021-2030: 4<sup>th</sup> trading period.** Legislative proposal for the revision of the EU ETS was presented by the European Commission in July 2015.

either, or a mixture of, the following:

- buy additional allowances
- draw on any surplus allowances they have saved from previous years.

Within limits, they can also buy credits from certain types of approved emission-saving projects around the world.

The need to purchase or draw on their reserves of allowances and credits creates a permanent incentive for companies to reduce their emissions by investing in more efficient technology or shifting to less carbon-intensive energy sources. Companies can also sell allowances and credits, for instance if they judge they have more than they are going to need. This allows them to choose the most cost-effective options to address their emissions.

## What the EU ETS covers

While emissions trading has the potential to cover many economic sectors and greenhouse gases, the EU ETS focuses on emissions which can be measured, reported and verified to a high degree of accuracy.

Participation in the EU ETS – understood as the obligation to surrender allowances for reported emissions – is mandatory for companies operating in the sectors covered, but in some sectors only plants above a certain size are included. Governments can exclude certain small installations from the system if fiscal or other measures are in place that will cut their emissions by an equivalent amount.

The EU ETS also covers emissions from aviation. Following international agreement in the International Civil Aviation Organization (ICAO) to take global action to address international emissions from aviation by 2020, the EU ETS applies until 2016 only to flights between airports located in the European Economic Area (EEA). After the 2016 ICAO Assembly, the European Commission will assess its outcome and could propose new legislation on the EU ETS for aviation.

## Greenhouse gases and sectors covered

### Carbon dioxide (CO<sub>2</sub>) from:

- Power and heat generation
- Energy-intensive industry sectors including oil refineries, steel works and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals
- Civil aviation

**Nitrous oxide (N<sub>2</sub>O)** from production of nitric, adipic and glyoxylic acids and glyoxal

**Perfluorocarbons (PFCs)** from aluminium production

## How allowances are allocated

### Auctioning

Since 2013, auctioning is the default method of allocating emission allowances. This means that businesses have to buy an increasing proportion of their allowances at auction. Auctioning is the most transparent method of allocating allowances and puts into practice the principle that the polluter should pay.

In sectors other than power generation, a transition to auctioning takes place progressively. Allowances not allocated for free are to be auctioned. This share will increase in the following years, as the volume of allowances allocated for free decreases faster than the cap. In total, the Commission estimates that 57% of the total amount of allowances will be auctioned during 2013-2020, while the remaining allowances are available for free allocation. The Commission's proposal for revision of the EU ETS Directive foresees that the share of allowances to be auctioned will remain the same after 2020.

**Power generators** have had to buy all their allowances since 2013. However, eight of the Member States which have joined the EU since 2004 – Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Poland and Romania – have made use of a provision allowing them to continue granting limited numbers of free allowances to existing power plants until 2019. In return they will invest at least as much as the value of the free allowances in modernising their power sector.

Auctions are held on a platform provided by an exchange appointed by national governments but are open to buyers from any country participating in the EU ETS. Most governments use a common platform for their auctions, but Germany, Poland and the UK have opted to use their own platforms. EU ETS allowance auctions take place on a daily basis since late 2012 and represent the most significant auction mechanism ever implemented for an environmental asset world-wide.



Under EU legislation, at least half of auctioning revenues, and all of the revenues from auctioning allowances to the aviation sector, should be used to combat climate change in Europe or elsewhere in the world. Member States are obliged to inform the Commission of how they use the revenues. The relevant information can be found in the annual Climate action progress reports.



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### Free allocation

- For **manufacturing industries**, the share of free allowances will decrease annually to reach 30% in 2020.
- For the **aviation sector**, the share of free allowances amounts to 82%.

The allowances given to manufacturing industries for free are distributed to companies on the basis of harmonised

### Preventing ‘carbon leakage’

‘Carbon leakage’ refers to the situation that may occur if, for reasons of costs related to climate policies, businesses transfer production to other countries which have laxer constraints on greenhouse gas emissions. This could lead to an increase in their total emissions. The risk of carbon leakage may be higher in certain energy-intensive industries.

The sectors and sub-sectors deemed to be exposed to a significant risk of carbon leakage are placed on an official list. The current list includes around 170 sectors and subsectors, covering a very high share of industrial emissions.

The list is established for five years, on the basis of clearly defined criteria and after extensive consultation with stakeholders. The current list applies for the years 2015-2019.

rules. This ensures that installations of a given type are treated equally across the EU. Underpinning these rules are ambitious benchmarks for emissions performance drawn up in consultation with industry. By rewarding the most efficient installations, the benchmarks strengthen the incentive for businesses to reduce their emissions.

Installations in sectors and sub-sectors deemed to be exposed to a significant risk of ‘carbon leakage’ receive special treatment to support their competitiveness. Installations meeting or beating the benchmark in principle receive all allowances they need for free.

In sectors not deemed to be at significant risk of carbon leakage, installations that meet the benchmark in principle received 80% of the allowances they need for free in 2013. This percentage is gradually reduced to reach 30% in 2020. Installations that fall short of the benchmark receive a proportionately lower allocation.

### Ensuring compliance

Businesses must monitor and report their EU ETS emissions for each calendar year and have their emission reports checked by an accredited verifier. They must surrender enough allowances to cover their total emissions by 30 April of the following year. These allowances are then cancelled so they cannot be used again.

A business is penalised if it does not surrender enough allowances. It has to buy allowances to make up the shortfall, is “named and shamed” by having its name published, and must pay a fine for each excess tonne of greenhouse gas emitted. In 2013, the fine amounted to €100 per tonne of CO<sub>2</sub> (or the equivalent amount of N<sub>2</sub>O or PFCs). The penalty rises annually in line with the European consumer price index.

The accurate accounting of all allowances issued is assured by a single Union registry with strong security measures. The registry keeps track of the ownership of allowances held in electronic accounts, just as a bank holds a record of its customers and their money.



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## How and where trading is done

Anyone with an account in the Union registry can buy or sell allowances, whether they are a company covered by the EU ETS or not. Trading can be done directly between buyers and sellers, through several organised exchanges or through intermediaries active in the carbon market.

The price of allowances is determined by supply and demand. In 2015, on average 26 million allowances or their derivatives were traded per trading day. This added up to over 6.6 billion allowances or their derivatives, with a total value of around €49 billion.

## Promoting low-carbon investment in Europe

By capping overall greenhouse gas emissions from major sectors of the economy, the EU ETS creates an incentive for companies to invest in technologies that cut emissions. The market price of allowances – otherwise known as the ‘carbon price’ – creates a greater incentive as it increases.

In addition, revenues from the sale of 300 million allowances – 5% of the allowances available in the period 2013-2020 – are used to co-finance large-scale demonstration projects in two areas of low-carbon technologies: carbon capture and storage, and innovative renewable energy technologies. This funding programme is known as NER300.

## Driving clean investment in developing countries

While allowances are the main currency of the EU ETS, companies can also use credits generated by certain types of emission-saving projects around the world to cover part of their emissions.

These projects must be recognised under the Kyoto Protocol’s

## How the EU ETS is established

- The directive on emissions trading was adopted by the European Parliament and Council (comprising member countries) in 2003, and substantially revised in 2009.
- The legislation needed to implement specific aspects of the directive (e.g. on carbon leakage, auctioning, international credits) is adopted by the European Commission after approval by the EU Climate Change Committee (grouping member state experts) and consultation of the European Parliament.
- Each year, Member States report to the Commission on how the EU ETS Directive is being applied.
- Additionally, the Commission monitors the carbon market and presents its conclusions in the annual Carbon Market Report.

Clean Development Mechanism or Joint Implementation mechanism as bringing real and genuinely additional emission reductions. Credits from new market mechanisms may also be accepted once they become available.

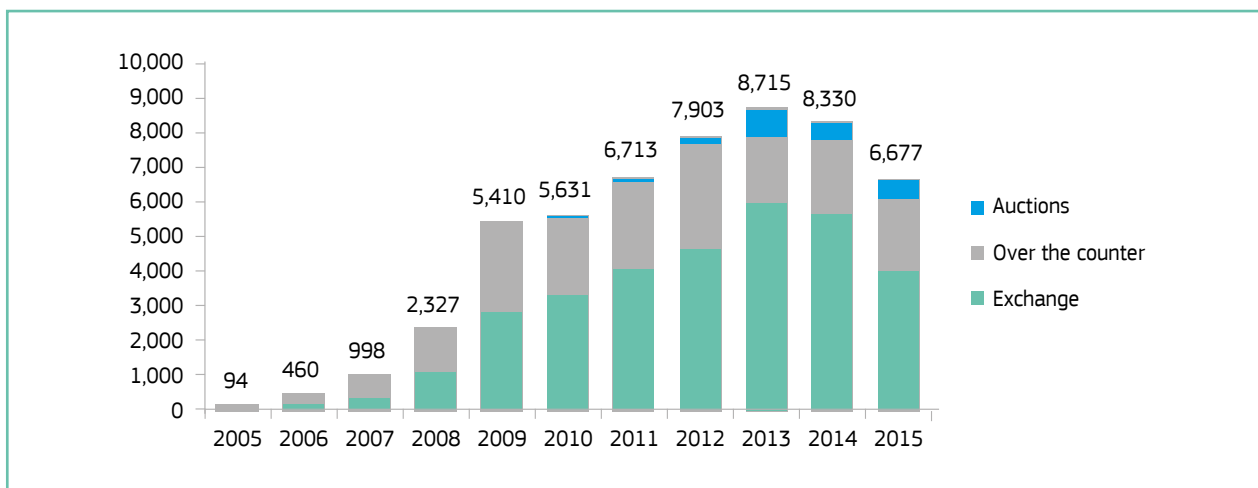
By allowing companies to buy international credits, the EU ETS is channelling substantial amounts of investment to promote clean technologies and low-carbon development in developing countries and economies in transition.

International credits can be used to cover some 1.6 billion tonnes of CO<sub>2</sub> emissions (or the equivalent amount of N<sub>2</sub>O or PFCs) between 2008 and 2020. As of 30 April 2016 the total number of international credits used or exchanged amounts to 1.468 billion, accounting for over 90 % of the allowed maximum.

## Building an international carbon market

The EU ETS is an important building block for developing an international carbon market. National or regional systems are already operating in China, South Korea, Canada, Japan, New Zealand, Switzerland, and the United States.

Trading volumes in EU emission allowances (in millions of tonnes)



Source: Bloomberg LP, ICE, EEX, NYMEX, Bluenext, CCX, Greenmarket, Nordpool, UNFCC. Also using Bloomberg New Energy Finance estimations.

The international carbon market is expected to develop through the bottom-up linking of compatible systems. Linking the EU ETS with other robust systems helps reduce the cost of cutting emissions, increase market liquidity, stabilise the carbon price, level the international playing field and support global cooperation on climate change.

The EU has agreed in principle to link the EU ETS with the ETS of Switzerland.

### Structural reform in phase 3

A major revision of the EU ETS ahead of the current trading period (2013-2020) strengthened the system and introduced increasingly harmonised rules.

However, the ETS continues to face a challenge in the form of a significant surplus of allowances, largely due to the economic crisis which has substantially depressed emissions.

In the short term, this surplus risks undermining the orderly functioning of the carbon market. In the longer term, it could affect the system's ability to meet more demanding emission reduction targets cost-effectively.

As a first step, the auctioning of 900 million allowances was postponed ("back-loaded") from 2013-2015 until 2019-2020.

A more structural measure – a market stability reserve – was agreed in 2015. This reserve, which will start operating in January 2019, aims to neutralise the negative impacts of the existing allowance surplus and improve the system's resilience to future shocks. The 900 million back-loaded allowances will be transferred to the reserve rather than auctioned in 2019-2020.

### EU ETS revision for phase 4 (2021-2030)

The Commission's proposal of July 2015 on the revision of the EU ETS for phase 4:





- is in line with the European Council conclusions of October 2014 on the 2030 climate and energy policy framework
- aims to achieve a 43 % reduction in EU ETS emissions compared to 2005 levels

The key aspects of the proposal:

- The overall **number of allowances to decline** at an annual rate of 2.2% from 2021 onwards, compared to 1.74% currently (corresponding to important emissions reduction)
- **Better targeted and more dynamic allocation of free allowances**, including:
  - update of benchmarks to reflect the technological progress
  - more targeted carbon leakage classification
  - free allocation better aligned with production levels
- Several **support mechanisms** help the industry and the power sectors meet the innovation and investment challenges of the transition to a low-carbon economy
  - Two new funds:
    - **Innovation Fund** – extending existing support for the demonstration of innovative technologies to breakthrough innovation in industry
    - **Modernisation Fund** – facilitating investments in modernising the power sector and wider energy systems and boosting energy efficiency in 10 lower-income Member States
  - Free allowances continue to be available to modernise the power sector in these lower-income Member States

### Useful resources:

European Commission Climate Action website and social media:

-  [ec.europa.eu/clima](http://ec.europa.eu/clima)
-  [facebook.com/EUClimateAction](https://facebook.com/EUClimateAction)
-  [twitter.com/EUClimateAction](https://twitter.com/EUClimateAction)
-  [youtube.com/EUClimateAction](https://youtube.com/EUClimateAction)
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