



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 high-emitting industry sectors 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 more than 11,000 power stations and manufacturing plants in the 28 EU member states as well as Iceland, Liechtenstein and Norway. Aviation operators flying within and between most of these countries are also covered. In total, around 45% of total EU emissions are limited by the EU ETS.
- As the main market for credits generated by emission-saving projects around the world, the EU ETS is a major source of investment in environmentally sustainable development in developing countries. The system is the world's biggest emissions trading market, accounting for over three-quarters of international carbon trading.
- The EU ETS is inspiring the development of national or regional emissions trading systems in several parts of the world. Europe is looking to link the EU ETS with compatible schemes in other countries, and a pathway for linking with Australia's system has been agreed in principle.

Greenhouse gases emitted by human activities are warming the Earth and causing changes in the global climate with increasingly severe human, economic and environmental impacts. Scientific evidence indicates that, to prevent climate change from reaching the most dangerous proportions, the world needs to stop the growth in emissions of greenhouse gases by 2020 at the latest and then reduce them sharply - by at least half of 1990 levels by 2050, and more after that.

Emissions trading systems are among the most cost-effective tools for cutting greenhouse gas 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 (CO₂) and other greenhouse gases at least cost. In contrast to traditional 'command and control' regulation, emissions trading harnesses market forces to find the cheapest ways of reducing emissions.

The EU ETS is the world's first major carbon market and remains by far the biggest today. The first international emissions trading system to address greenhouse gas emissions from companies, the European system accounts for over three-quarters of the trading volume of the international carbon market and functions as its engine.

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. A sufficiently high carbon price also promotes investment in clean, low-carbon technologies.

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

While the regulatory framework of the EU ETS was largely unchanged for the first two trading periods of its operation, the beginning of the third trading period in 2013 brings a major reform based on common rules which will strengthen the system.

This factsheet explains the EU ETS as it stood in October 2013.

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 each year by the power plants, factories and other companies covered by the system is subject to a cap set at EU level. Within this Europe-wide cap, companies receive or buy emission allowances which they can trade if they wish.

From 2013 onwards, 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 trading 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 CO₂, the main greenhouse gas, or the equivalent amount of two more powerful greenhouse gases, nitrous oxide (N₂O) and perfluorocarbons (PFCs).

Allowances can be used only once. Companies have to surrender allowances for every tonne of CO₂ (or the equivalent amount of N₂O

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 buy additional allowances or else 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. But companies can also sell allowances and credits, for instance if they judge they have more than they are going to need.

These flexibilities in the system allow companies to choose the most cost-effective options to address their emissions. The main options can be broadly summarised as:

- Investment in more efficient technology and/or a shift to less carbon-intensive energy sources in order to reduce emissions;
- Purchase of extra allowances or credits on the market;
- A combination of the above.

EU ETS: Key facts

- Operates in the 28 EU countries plus Iceland, Liechtenstein and Norway
- Limits greenhouse gas emissions from:
 - More than 11,000 heavy energy-using installations in power generation and manufacturing industry
 - Operators of flights to and from the EU, Iceland, Liechtenstein and Norway
- Covers around 45% of the EU's greenhouse gas 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 with a high level of accuracy.

The system covers emissions of carbon dioxide (CO₂) from power plants, a wide range of energy-intensive industry sectors and commercial airlines. Nitrous oxide emissions from the production of certain acids and emissions of perfluorocarbons from aluminium production are also included (see box for full details.)

Greenhouse gases and sectors covered

Carbon dioxide (CO₂) 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 (N₂O) from production of nitric, adipic, glyoxal and glyoxalic acids

Perfluorocarbons (PFCs) from aluminium production

Participation in the EU ETS is mandatory for companies operating in these sectors, 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 to take global action to address international emissions from aviation by 2020, the European Commission has proposed limiting the scope of the EU ETS until then to the proportion of a flight's emissions that takes place within the European regional airspace. Many routes to and from developing countries with relatively low aviation emissions will be exempted.

Altogether the EU ETS covers around 45% of total greenhouse gas emissions from the 28 EU countries.

Cutting greenhouse gas emissions: EU targets* and dates

2020: -20% (or -30% if other major economies commit to undertake their fair share of a global reduction effort)

2050: -80-95%

*compared to 1990 levels



© iStockphoto

How allowances are allocated

Auctioning

Whereas the vast majority of emission allowances was previously given away for free by governments, from 2013 auctioning is the main method of allocating allowances. This means that businesses have to buy an increasing proportion of their allowances at auction. The EU legislation sets the goal of phasing out free allocation completely by 2027. Auctioning is the most transparent method of allocating allowances and puts into practice the principle that the polluter should pay.

From 2013 **power generators** must buy all their allowances: experience shows that they have been able to pass on the notional cost of allowances to customers even when they received them for free. 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.

Given the significant weight of power generation in the EU ETS, and even with partial free allocation in the eight member states, more than 40% of allowances in the system will be auctioned in 2013 and this share will rise progressively in the following years.

Eighty-eight per cent of the allowances to be auctioned are allocated to states on the basis of their share of verified emissions from EU ETS installations in 2005. Ten per cent are allocated to the least wealthy EU member states as an additional source of revenue to help them invest in reducing the carbon intensity of their economies and adapting to climate change. The remaining 2% is given as a 'Kyoto bonus' to nine EU member states which by 2005 had reduced their greenhouse gas emissions by at least 20% of levels in their Kyoto Protocol base year or period. These are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia.

Auctions are held by companies 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.

Under the relevant 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 other countries. Member states are obliged to inform the Commission of how they use the revenues. Germany, for instance, is spending a large part of its auctioning revenues on climate change projects in developing countries and emerging economies.

Free allocation

In sectors other than power generation, the transition to auctioning is taking place progressively. **Manufacturing industry** will receive 80% of its allowances free of charge in 2013 but this will decrease annually to 30% in 2020. Allowances not allocated for free will be auctioned. In the **aviation sector**, however, only 15% of allowances will be auctioned over the whole 2013-2020 period.



The allowances given to manufacturing industry for free are distributed to companies on the basis of harmonised rules. This ensures that installations of a given type are treated equally across the EU. Underpinning these rules are ambitious benchmarks of emissions performance which have been 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 which are deemed to be exposed to a significant risk of 'carbon leakage' (see box) receive special treatment to support their competitiveness. Those reaching the benchmark level in principle receive for free all of the allowances they need, based on their historic emissions, for the whole 2013-2020 period. Installations falling short of the benchmark receive a proportionately lower allocation of free allowances compared to their emissions, and therefore need to reduce their emissions and/or buy more allowances.

In sectors not deemed to be at significant risk of carbon leakage, installations which attain the benchmark performance level in principle receive 80% of the allowances they need for free in 2013. This percentage is reduced annually to 30% in 2020. Again, installations falling short of the performance benchmark receive a proportionately lower allocation of allowances than those which reach it.

Preventing 'carbon leakage'

'Carbon leakage' is the term used to describe the situation that may occur if, for reasons of costs related to climate policies, businesses transferred 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 which are deemed to be exposed to a significant risk of carbon leakage are those that figure in an official list. This is established for five years, on the basis of clearly defined criteria and after extensive consultation with stakeholders. The first carbon leakage list applies to the free allocation of allowances in 2013 and 2014. The list is based on agreed criteria and contains 170 sectors and subsectors, covering a very high share of industrial emissions.

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 to cover its emissions. It has to buy allowances to make up the shortfall, is "named and shamed" by having its name published, and must pay a dissuasive fine for each excess tonne of greenhouse gas emitted. The fine in 2013 is €100 per tonne of CO₂ (or the equivalent amount of N₂O or PFCs). The penalty rises annually in line with the annual rate of inflation in the Eurozone (the group of EU countries using the euro as their currency).

EU ETS: Development in phases

2005-2007: 1st trading period used for 'learning by doing.' EU ETS successfully established as the world's biggest carbon market. However, the number of allowances, based on estimated needs, turns out to be excessive; consequently the price of first-period allowances falls to zero in 2007.

2008-2012: 2nd trading period. Iceland, Norway and Liechtenstein join (1.1.2008). The number of allowances is reduced by 6.5% for the period, but the economic downturn cuts emissions, and thus demand, by even more. This leads to a surplus of unused allowances and credits which weighs on carbon price. Aviation brought into the system (1.1.2012).

2013-2020: 3rd trading period. Major reform takes effect (1.1.2013). Biggest changes are 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 joins the ETS (1.1.2013).

2021-2028: 4th trading period.

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

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 - the 'carbon price' - creates a greater incentive the higher it is.

In addition, revenues from the sale of 300 million allowances - 5% of the total number allowances available in the 2013-2020 period - are being used to co-finance the construction and operation of 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.

How the EU ETS is established

Directive on emissions trading adopted by the European Parliament and Council (comprising member countries) in 2003; substantially revised in 2009 to strengthen the EU ETS from 2013.

The legislation needed to implement specific aspects of the directive (eg 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.

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 a proportion of their emissions. These projects must be recognised under the Kyoto Protocol's 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 and clean technologies to promote low-carbon development in developing countries and economies in transition.

Overall, international credits can be used to cover emissions of some 1.6 billion tonnes of CO₂ (or the equivalent amount of N₂O or PFCs) between 2008 and 2020. This represents half the reduction in emissions that will be made under the EU ETS in that period. Over 1 billion credits had already been used by the end of 2012. Credits are accepted from all types of projects except nuclear energy projects, afforestation or reforestation activities and projects involving the destruction of industrial gases.

Building an international carbon market

The European Commission sees the EU ETS as an important building block for developing an international network of emission trading systems. The international carbon market is expected to develop through the bottom-up linking of compatible domestic cap-and-trade systems. National or sub-national systems are already operating in Australia, Japan, New Zealand, Switzerland and the United States, and are planned in Canada, China and South Korea.

Linking the EU ETS with other robust emissions trading systems provides several potential benefits including reducing the cost of cutting emissions, increasing market liquidity, stabilising the carbon price, leveling the international playing field and supporting global cooperation on climate change.

In a major step towards the first full inter-continental linking of emission trading systems, the European Commission and Australia have agreed that the EU ETS and the Australian emissions trading scheme should be fully linked by mid-2018, with an interim link from 1 July 2015. This means that Australian businesses will be able to use EU allowances to help cover their emissions under the Australian scheme. Negotiations are also under way with Switzerland on linking the EU ETS with the Swiss ETS.



Structural reform

However, the ETS also faces a challenge in the form of a growing surplus of allowances, largely because of a greater than anticipated reduction in emissions since 2008 due to the economic crisis. In the short term this surplus risks undermining the orderly functioning of the carbon market; in the longer term it could affect the ability of the EU ETS to meet more demanding emission reduction targets cost-effectively.

The Commission has therefore taken the initiative to postpone the auctioning of some allowances as an immediate measure, while also launching a debate on structural reform measures which could provide a sustainable solution to the surplus in the longer term.

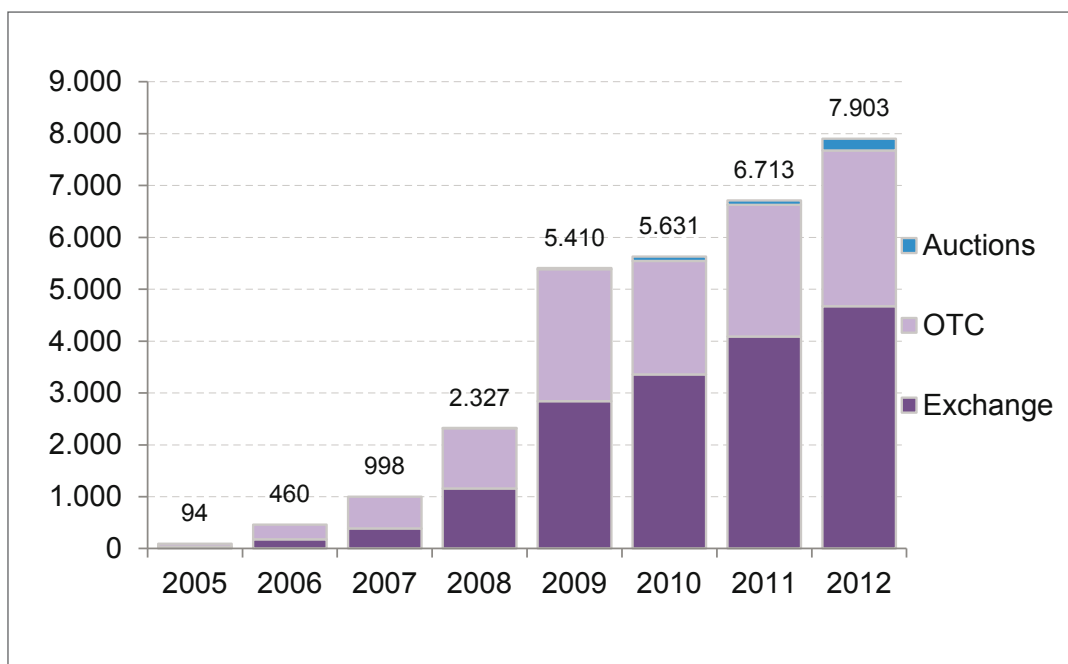
How and where trading is done

Anyone with an account in the EU 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 the many intermediaries active in the carbon market.

The price of allowances is determined by supply and demand. As many as 40 million allowances have been traded per day. In 2012, 7.9 billion allowances were traded with a total value of €56 billion. (See graph.)



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



Source: Bloomberg New Energy Finance. Figures taken from Bloomberg, ICE, Bluenext, EEX, GreenX, Climex, CCX, Greenmarket, Nordpool. Other sources include UNFCCC and Bloomberg New Energy Finance estimations.

October 2013



© European Union, 2013
 Reproduction is authorised provided
 the source is acknowledged.

