



postnote

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GLOBAL CARBON TRADING

The EU has a target of reducing overall greenhouse gas emissions to at least 20% below 1990 levels by 2020. To assist in achieving this legally binding goal and delivering emissions reductions at reduced economic cost, the EU Emission Trading System started in 2005, creating mandatory carbon trading within the EU. This POSTnote looks at the EU trading system's mechanisms, comparing it with operational and proposed emissions trading systems elsewhere. Prospects of linking these to form an international system, and the alternatives, are also discussed.

Background

There are many approaches to reducing carbon dioxide (CO₂) and other greenhouse gas (GHG) emissions linked to climate change, including regulation, subsidies and standard setting. There are two main market-based options: cap-and-trade, such as the EU Emission Trading System (EU-ETS), and a carbon tax. It should be noted that the efficacy of any approach depends on the domestic context in which it is used.

Cap-and-Trade

Under cap-and-trade, a cap is set on the total amount of GHG emissions permitted. Allowances (or permits) to emit are then either allocated to, or purchased by, organisations whose emissions are limited by the cap. After a predetermined period has elapsed, these emitters are required to submit emission allowances equivalent to the amount of GHGs emitted. Emissions of non-carbon dioxide greenhouse gases are converted into an equivalent amount of carbon dioxide (CO₂e). The cost of buying an emissions allowance promotes investment in reducing emissions. Those who reduce their emissions below the amount allocated to them can sell their excess allowances to others.

The price of carbon is determined by the market, based on the relative difficulty of emissions reduction and the availability of allowances (see Box 1). In theory, those with the ability to reduce their emissions for the least cost will do so first. This process of price discovery is aided by a well-functioning financial market. Unlike a

carbon tax, cap-and-trade is not designed to produce a certain carbon price, but it does set a limit on emissions.

Carbon Tax

A carbon tax sets a price on carbon emissions, but it cannot guarantee the level of emissions reduction. As countries have existing tax regimes, a carbon tax may be more straightforward to administer within an individual country. However, it would be challenging to implement internationally. An EU-wide carbon tax was set aside due to a lack of unanimous agreement (although Sweden has had one since 1991). Instead, the EU-ETS was successfully negotiated in 2003, and began operation in 2005. It is the largest multi-country, multi-sector GHG emission trading system.¹

Box 1. Carbon Price

One of the most useful indicators generated by the EU-ETS is the market value of the emissions allocations, also known as the carbon price. The carbon price is influenced by the level of the emissions cap (high cap, low price), cost of emission abatement efforts (high abatement costs mean less abatement action, increasing demand for allowances and hence the carbon price) and economic conditions. In the absence of a transition to a low-carbon economy (POSTnote 318), growth in economic activity is likely to lead to higher emissions, and therefore a high carbon price.

EU-Emissions Trading System

The EU-ETS is a mandatory trading system covering all EU Member States, set up alongside the Kyoto Protocol. It aims to help emission reduction targets to be met efficiently, and currently covers around half of Europe's CO₂ emissions (equivalent to 42% of all Europe's GHG emissions). The sectors currently involved are large-scale electricity generation and large stationary emitters such as the iron, steel and cement industries. The EU-ETS trading units are called EU Allowances (EUAs), with one EUA equivalent to one tonne of CO₂e. Emitters are required to measure and report their emissions, and to surrender an equivalent number of allowances at the end of each trading year.

Features of the EU-ETS

The EU-ETS has an 'absolute cap' which sets a maximum level of GHG emissions allowed during a trading phase. Other important design features include:²

- **allocation** – how the emission permits are distributed, they can either be sold at a fixed price, auctioned, or given free based on historical emissions (“grandfathered”);
- **gas coverage** – the GHGs covered (see Table 1);
- **offsetting** – allowing emissions targets to be met partly through emissions ‘credits’ generated by reducing emissions in other sectors or countries (see Box 2);
- **banking** of emissions permits - allowing companies to carry over emissions allowances between years and trading phases (see Box 3).

Box 2. Offsets

Under the EU-ETS, flexible offsetting features allow emitters to comply with their emission reduction targets via credits generated from “Joint Implementation” (JI) - joint projects carried out in developed countries, and through the “Clean Development Mechanism” (CDM) - projects carried out in developing countries. If these projects lead to additional emissions reductions beyond those in a “business as usual” scenario (known as “additionality”) the investing country earns certified emission reductions credits which it can sell or use to offset its own emissions, while the host country benefits from investments in its infrastructure.

The concept of additionality begins with considering whether a carbon offsetting project would have ‘happened anyway’ in the absence of the CDM. There is a concern that many offsetting projects to reduce greenhouse gases would have taken place anyway, either because the project already made financial sense or it was already a common industrial practice. If emissions credits were given in such cases, the trading scheme participants’ emissions would not be offset, and it would lead to a net increase in emissions and no additionality. This concept is essential to the success and integrity of any offsetting system.

The CDM Executive Board can reject or accept projects or programmes, using standardised methodologies to determine additionality and baseline emissions. It then attempts to determine the actual emissions of a project once it has been implemented, before issuing the appropriate credits.

EU-ETS Issues

Carbon Leakage

To avoid increased costs due to GHG emissions policies, industry may relocate to parts of the world without carbon reduction policies, leading to an increase in GHG emissions elsewhere. This is known as “carbon leakage”. In addition, it could potentially cause job losses in the EU. If relocated outside the EU, industrial activities may become more carbon intensive. Conversely, a new plant built outside the EU may be more efficient. The EU-ETS has attempted to deal with carbon leakage by “free allocation” of emission permits, effectively subsidising carbon costs. While too many free permits would shelter emitters from the true cost of their emissions – and potentially lead to windfall profits – too few would adversely affect competitiveness (see Box 4). Free allocations can also distort the cap-and-trade-market,

introducing inefficiencies that could increase the overall cost. Achieving the correct balance remains a challenge for Phase III of the EU-ETS (Box 3).

To avoid carbon leakage, the cost of carbon could be accounted for as goods pass through borders (into an ETS zone), known as ‘border levelling’ or border tariff agreements (BTA). This could provide an effective solution to carbon leakage in some sectors, but would be against WTO rules, difficult to negotiate, and risk damaging trade relations between countries.

Box 3. EU Emissions Trading System Phases

Phase I (2005-2007) Only CO₂ emissions were covered, with the option to voluntarily opt-in other greenhouse gases. Each Member State made free allocations to businesses through a National Allocation Plan (NAP) agreed with the European Commission, and the combined total of these allocations constituted the EU level cap. Phase I allowances could not be banked forward for use in subsequent phases.

Phase II (2008-2012) The EU was much tougher in ensuring that Member States’ NAPs delivered a tighter cap. Phase II is projected to reduce EU emissions by 6% on 2005 levels by 2012, with the auctioning of around 3% of allowances. The auctioning level in the UK is around 7%. Unlimited banking will be possible between Phases II and III. Operators can use offsets to meet their commitments, subject to maximum limits. Three non-EU countries – Norway, Iceland and Liechtenstein – also linked in.

Phase III (2013-2020) was agreed in December 2008. The cap will be more ambitious and set centrally rather than being the sum of the Member States’ NAPs. More sectors (including aviation from 2012) and more gases will be included. The cap will decline linearly, to deliver a total reduction of 21% below 2005 levels by 2020. At least 60% of allowances will be auctioned by 2020, with the remaining allocation based on benchmarks (the starting point will be the average performance of the 10% most efficient installations in a sector). If an international agreement is achieved and the EU accepts an overall reduction target greater than 20%, the cap will be tightened to deliver emissions reductions that are consistent with this target. Access to offset credits will be limited to 50% of the abatement effort.

Loose Emission Cap

A “loose” cap – one that does not exert sufficient downward pressure on emission levels, will result in low carbon prices. In Phase I of the EU-ETS, the cap set by Member States through their National Allocation Plans was greater than verified emissions, leading to the collapse of EUA carbon prices. Although caps have been significantly tightened in Phase II, the onset of recession has reduced production and emissions, lowering the carbon price.

Price Signal for Investment

Investors base their estimates of the long term carbon price on knowledge of the long term cap. As with other commodities, risks due to short term carbon price variations are managed by hedging investments. Phase I of the EU-ETS experienced large fluctuations in carbon prices due to too many free allocations. Initially there

were no verifiable emissions data, but since 2005, they have been collected systematically, resulting in more informed free allocation. Phase II has delivered more stable prices and tighter caps, although there was a drop at the start of the recession as industrial output fell. As the aim of the EU-ETS is to reduce emissions to meet a cap, the market is left to determine the price needed to meet that cap. That price then influences the emission reduction techniques or technologies that attract investment. Promotion of specific technologies – such as renewables, nuclear or carbon capture (POSTnotes 315, 317, 335) – lies outside the remit of the EU-ETS, and requires complementary government policies.

Effectiveness of Offsetting

Offset projects are scrutinised through a monitoring, recording and verification (MRV) process to check their environmental integrity and additionality (see Box 2). Those not approved cannot be used for compliance. There are concerns that some offset projects in developing countries result in large profits for the project developers while doing little for the host country. Projects also require a minimum level of institutional capacity, so they are rarely proposed for the least developed countries where the investment environment is considered less favourable. There have also been calls for a move to a more large scale and ambitious sector-based crediting system for developing economies.

Box 4. Carbon and Competitiveness

The Carbon Trust (an independent company set up by Government in 2001 to accelerate the move to a low carbon economy) carried out an analysis on manufacturing in the UK and other EU countries. It revealed that the impact of the EU-ETS on profitability and trade has been limited to a few sectors. For most of the manufacturing industry, carbon costs will remain trivial compared with other influences on international competitiveness. This means that lack of investment in emissions abatement is determined by the carbon price, rather than by competition worries. Carbon Trust modelling suggests that by 2016, if there were only pure auctioning in Phase III of the EU-ETS (no free allocations, which will not be the case), 2% of emissions reductions from electricity, 21% from aluminium, 41% from steel, and 19% from cement ingredients would be attributable to “leakage” (delivered by shifting production outside of the EU).³ These sectors account for 34% of the emissions capped under the EU-ETS – the potential leakage would represent less than 2% of EU emissions (but as can be seen the percentage could be significant within sectors). Special measures - including a degree of free allocation - have been agreed by the EU to alleviate impacts on sectors at risk of carbon leakage.

Governance

The smooth running of the EU-ETS relies on a well functioning market system that can support carbon trading. This system consists of a market place where demand meets supply, as well as rules and regulation governing its running. Actual trading can be conducted either on an exchange (an organised trading platform) or over the counter (private trading) with the majority of the volume currently taking place on exchanges such as Bluenext and ECX (European Climate Exchange).

Linking International ETS

Apart from the EU-ETS, other systems have been proposed or set up in the USA, Canada, Japan, Australia, New Zealand, Switzerland, Mexico, Taiwan and South Korea. The only operational systems are the EU-ETS, New Zealand ETS, Swiss ETS and RGGI (a cap-and-trade initiative in the northeast and mid-Atlantic states of the U.S.).⁴ A regional system between seven U.S. western states and four Canadian provinces has also been proposed for 2012.⁵ The EU-ETS is currently the largest, but would come second to a US federal system. The EU and U.S. systems (see Box 5) are compared in Table 1.

Table 1: Comparison of Emissions Trading Schemes¹⁰

		EU-ETS	United States		
			RGGI	Waxman Markey Bill	Kerry Boxer Bill
Start Date		2005	2009	2012	2012
Market Size (Mt CO₂e)		2000	170	5500	4627
Gases	CO₂	✓	✓	✓	✓
	N₂O & PFC	✓ 2013	✓		✓
	Other Kyoto	✓			✓
	NF₃	✓			✓
Targets	Base Year	2005	2009	2005	2005
	2020	-21%	-10%	-17%	-20%
	2030	-50 to	-	-	-20%
	2050	-80%	-	-	-83%
Auctioning		-60 to 100%	~100%	~15%	TBD

Benefits of Linking

Linking carbon trading systems increases the number of participants involved, which in theory helps to level the playing field across countries, and increases both the number of carbon abatement options and the efficiency of carbon reduction. The larger the carbon market the more ‘liquid’ it should be, allowing emission permits to flow around, making it less susceptible to political bargaining, trade tariffs, market manipulation or speculations (risky purchases without fully understanding the market, leading to deviations from a commodity’s true value). It should also reduce concerns about large corporations manipulating the market. A linked market, in theory, is also less concentrated, leading to more competition, and therefore a more efficient marketplace.

Developing Economies

With the prospect of developing economies joining carbon trading systems, there is also the potential for substantial reductions in compliance costs to be made by providing access to cheaper abatement options. This also results in a transfer of funds from developed to developing nations, achieved via capital flow from a higher priced carbon market to a lower priced one.⁶

Direct Linkage

A direct link would enable different trading systems to recognise each other's emission allowances. The European Commission has ambitions to create an OECD-wide market, starting with a transatlantic link by 2015, and extended to developing countries by 2020.⁷ It is important to ensure that emissions trading schemes have similar design features. Price caps, different policies on offsets, and large differences in ambition between systems are barriers to linking. The Commission and Member States are working with those developing trading schemes, to exchange experience and encourage the development of compatible systems.

Box 5: US Cap-and-Trade Legislation

The Waxman-Markey Bill⁸ on a federal emissions cap-and-trade system passed the US Congress' House of Representatives, in June 2009. Its upper chamber, the Senate, is currently scrutinising its own versions of the legislation including the Kerry-Boxer Bill⁹, and the bipartisan Cantwell-Collins and Graham-Lieberman-Kerry Bills. If the Senate passes a bill, both it and the House Bill will then have to be harmonised before going back to their respective chambers. If approved by both chambers, the joint bill will be put to the US president for acceptance or rejection. The US Environment Protection Agency (EPA) recently found that "GHG in the atmosphere threatens the public health and welfare of current and future generations", although this "endangerment finding" is being challenged in the courts and Congress. The finding potentially could allow the EPA to act to reduce GHG emissions through the existing US Clean Air Act 1990 (trading in emissions of sulphur oxides and nitrogen oxides was setup under this legislation).

Indirect Linkage

An indirect link - such as currently exists between the EU-ETS and RGGI in the USA - involves carbon trading systems accepting allowances or offsets from a third common pool. Both systems accept a small number of CDM and JI offsets from the Kyoto Protocol. Since the quantity of CDM offsets permitted under both systems is limited (8% for the UK under EU-ETS, 3.3% increasing to 10% for RGGI) this indirect link is weak, but some stakeholders would like it to grow. The future of this will depend on the extent that offset credits are accepted.

Challenges to a Global ETS

The operating features of current and future GHG cap-and trade systems are still in flux, with their designs reflecting the various countries' environmental and political ambitions, as well as their economy. Differences in the following features pose challenges to linking systems:¹⁰

- **cap types and allocations** – variations are absolute caps such as the EU-ETS, an intensity/output based relative cap such as the Japanese ETS, and the extent and timing of auctions
- **price intervention** - a minimum carbon price floor and/or ceiling, carbon credit borrowing provisions, penalties and enforcement provisions
- **offsets** – limits of use, and their quality and type
- **coverage and scope** of the system - which GHGs are covered, and which industrial sectors.

Some of the differences above need to be addressed to avoid obstacles to linking the various different schemes to form a single, global emissions trading system. The House of Commons Environmental Audit Committee acknowledged that differences between systems would have to be addressed, and perhaps some sort of carbon 'exchange rate' used to create a level playing field.¹¹ An international carbon market would provide a common price signal across international boundaries, reducing competitive distortions due to differences in carbon regulation. This would remove the need for border tariff agreements, and potentially encourage further and more efficient investment in low carbon technologies.

Overview

- The EU-ETS allows large emitters to trade emission permits with each other, generating a carbon price.
- For a large majority of manufacturing industry, carbon costs remain trivial compared with other factors affecting international competitiveness.
- A low carbon-price sends a weak signal to investors in low-carbon technologies.
- Carbon markets can be linked through the direct exchange of emissions allowances between systems, or indirectly through emissions credits generated in a third common pool.
- A linked international cap-and-trade system would provide a common carbon price signal.

Endnotes

- 1 *Carbon Markets*, 'Carbon Tax', Earthscan 2009
- 2 *Global Carbon Trading*, 'Issues in International Linking', DECC 2009
- 3 *Tackling Carbon Leakage*, Part A Section 4, Carbon Trust 2010
- 4 RGGI, <http://www.rggi.org/home> 2009
- 5 WCI, <http://www.westernclimateinitiative.org/> 2009
- 6 *Stepping up International Climate Finance*, EC Sept. 2009
- 7 *Towards...Copenhagen*, 'Int'l Carbon Market', EC January 2009
- 8 *American Clean Energy and Security Act of 2009*, H.R.2454
- 9 *Clean Energy Jobs and American Power Act*, S.1733, 2009
- 10 *Linking ETS*, 'Prospects & Issues for Business', Carbon Trust 2009
- 11 *The role of carbon markets...*, HC 290, HoC EAC 2010

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