

# Agenda

Advancing economics in business

## European emissions trading: is it working?

**The EU Emissions Trading Scheme has established a carbon market worth around €40 billion per year, with further extensions planned. However, the most obvious carbon savings so far are happening outside the EU, and the disputes around Phase II caps look set to test the political acceptability of high carbon prices. Martin Brough, Oxera Director, explains why**

2006 is a key year for the EU Emissions Trading Scheme (EU ETS). The first audited data for actual emissions at the start of Phase I (2005–07) has been published,<sup>1</sup> the allocation plans for Phase II of the EU ETS (2008–12) are being submitted, and the Commission is beginning its review of the scheme to identify what changes may be desirable for Phase III (2013–17) and beyond. It is therefore an appropriate time to review the evidence on how the EU ETS has been working so far, and what challenges remain if it is to fulfil its function as the centrepiece of the EU's actions to tackle climate change.

### Nuts and bolts

Is the EU ETS working? One aspect of answering this question is to pose a more basic one: is the EU ETS functioning? In this respect at least the scheme may be considered a success. The Directive enabling the scheme was passed in 2003 in record time.<sup>2</sup> It established the legal framework for a cap-and-trade system, with key industrial sectors, including power generation, being subject to limits on emissions of CO<sub>2</sub>.

Forward trading started before the commencement of the physical market, albeit with limited volumes. The scheme required Member States to submit national allocation plans (NAPs) for approval by the Commission, and although official deadlines were missed, enough was done to ensure that the scheme was up and running on schedule from January 2005.

Registries of allowance holders now facilitate a spot market in the allowances, and liquidity increased consistently during 2005 and into early 2006. Power generators form the largest single group of emitters in the scheme, and they were at the heart of much of the early trading (and remain key to price formation). Banks, hedge funds and other commodities traders are also increasingly active in the market. A number of exchanges offer carbon trading, although the European Climate Exchange (ECX)<sup>3</sup> has by far the largest share of the

market. Total trades, including over-the-counter trades, have been estimated to be worth around €9 billion–€10 billion so far in 2006.<sup>4</sup>

The EU-wide nature of the scheme facilitates liquidity in the market. With over two billion tonnes of allowances per year covered by the EU ETS, and a prevailing price of around €15–€20/tonne, the underlying market is worth around €30–€40 billion per year.<sup>5</sup> This can be compared with the UK power market with around 350TWh at £50/MWh, implying an underlying market of around €25 billion per year.<sup>6</sup>

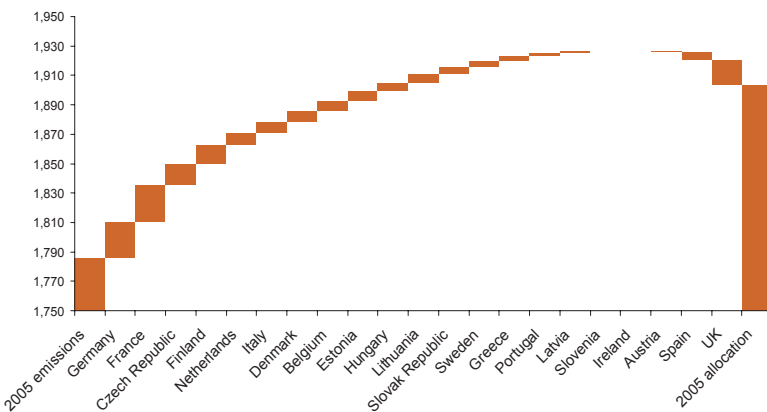
However, one of the factors holding back liquidity in the EU ETS is the large number of smaller players with allowance allocations. Although the Phase I market is perceived by many to be characterised by long allowances (ie, there is a greater allocation of allowances than industry needs in a 'business-as-usual' scenario), the surpluses are held to a large extent by small companies, which may not be set up to sell them. This may be one reason why the price for Phase I allowances has not collapsed to zero following publication of the 2005 actual emissions data (see below).<sup>7</sup>

### Information revelation

One of the key features of markets is their role in revealing information. It is certainly the case that, since the EU ETS was launched, there is far more analysis of the opportunities and costs of carbon abatement.

A much more rigorous auditing process for the emissions of the installations in the scheme has also been undertaken. The results of the first year of audited emissions (2005 calendar year emissions) were published by the European Commission in May this year (although four Member States were missing from this data, including Poland, which has a surplus of allowances relative to emissions). Figure 1 summarises the key results. The bottom line is that the audited

**Figure 1 Surplus allowances compared with actual emissions (MtCO<sub>2</sub>)**



Source: European Commission (2006), op. cit.

figures show that actual emissions were well below the level of the cap. Only Austria, Spain and the UK had a shortfall of allowances compared with actual emissions.

Figure 2 shows how the price for carbon allowances reacted to this data. Prices peaked at about €30/tonne in April 2006 but collapsed as the extent of the surplus became apparent, dipping below €15/tonne.

Prices have since staged a modest recovery, which may be explained in part by the fact that high gas prices have continued to incentivise coal-fired generation, that some installations in surplus are not selling their excess allowances, and that some allowances can be carried over into Phase II of the scheme which starts in 2008.

In some ways the EU ETS has been a useful mechanism for quantifying the degree of political will in the EU to take tough action to curb emissions. There has been relatively little willingness so far for Member States to submit NAPs well below business-as-usual emissions, with only the UK setting stringent targets. The rules of the Directive encourage the lax approach since each Member State can make relatively little difference to the

**Figure 2 Prices for first forward year allowances, and for 2008 allowances (€/tonne)**



Source: ECX.

total allocation, while its installations benefit from a generous NAP.

In theory, the Directive addresses this issue by trying to ensure that NAPs are consistent with the Member States' agreement to curb emissions under the Kyoto protocol. Phase II is designed to match the Kyoto compliance period of 2008–12, making it easier to ensure consistency between targets. However, the 'gaps' between the scope of the two schemes partly frustrates this process, allowing Member States to argue that emission reductions will happen *outside* the EU ETS but *within* Kyoto, which includes other greenhouse gases (GHGs) and other sectors.

It is encouraging for supporters of the EU ETS that the price for the 2008 allowances is currently trading at a premium to the first forward year (2006), which may be taken as a sign of confidence that there will be some form of carbon constraint in Phase II. This view may be partly based on tough guidance set out in December 2005 from the European Commission about what would be considered compliant NAPs.<sup>8</sup> Over the next six months there will be a real test of how tough the Commission will be in rejecting non-compliant NAPs. The presence of the forward 2008 price will give all parties a signal about how their policies are being regarded by the market.

## Is the EU ETS delivering carbon savings?

Supporters of the EU ETS can point to a working system, with better auditing of emissions than ever, and a price that implies that the system is constrained to some extent. But can they point to real carbon savings being made as a result of the scheme? Perhaps the most obvious carbon abatement that is taking place is the rapid development of the international Certified Emission Reduction (CER) market, based on the flexibility mechanisms of Kyoto. The EU's Linking Directive allows Member States, and installations (if enabled by each Member of State), to meet part of their obligation through purchasing CERs.<sup>9</sup> Anywhere between 500m and 1 billion tonnes of these offsetting credits are expected to be used to mitigate the need for EU action to meet Kyoto targets over the 2008–12 period. Schemes have to demonstrate additionality (ie, that carbon reductions would not have happened otherwise) to qualify for offset credits under the UN framework. Large amounts of money are already being poured into carbon mitigation schemes around the world, with many of these being funded as a result of the EU ETS. There

is little doubt that the clearest market signal being given by the EU ETS to date is that it is cheaper to undertake abatement outside the EU than in it.

If fostering a global market for carbon abatement is a desirable aim, the EU also wants to show that genuine action can be achieved at home. In this respect it is harder to point to material results from the EU ETS at this stage. The most obvious way of reducing CO<sub>2</sub> emissions within the scheme given the existing capital stock is to increase the utilisation of low-carbon gas-fired power stations, and to reduce the utilisation of coal capacity. Every 1MWh of generation that is switched from coal to gas saves over 0.5tCO<sub>2</sub>.

Is behavioural change being engendered by the EU ETS? One encouraging sign is that, in many industries, including key generation markets such as the UK and Germany, the marginal cost of carbon is being priced into marginal generation costs, and therefore being taken into account in output decisions. The problem is that gas prices are so high that a carbon price of €15–€30/tonne has not in general been sufficient to make the fuel switch worthwhile. A difference in fuel costs for generation of as much as €25/MWh would imply that a carbon price of around €50/tonne would be required to encourage a gas-fired station to turn on before a coal station.<sup>10</sup> Given the seasonal nature of gas prices (particularly in the UK), the relative costs become more favourable to gas in the summer than the winter, and it seems possible that at least modest summer switching has been encouraged in the UK generation market by the EU ETS.

Providing a similar carbon-abatement contribution to the international offsetting credits would require around 200TWh pa of coal to gas switching in the generation sector during 2008–12.<sup>11</sup> This in turn would require a significant switch in capacity, with retired coal stations replaced by new combined-cycle gas turbines. What evidence is there that the EU ETS is encouraging a shift towards lower carbon capacity? The two most obvious effects to date have suggested perverse incentives.

- In the UK, a large amount of ageing coal capacity has opted to fit-flue gas desulphurisation (FGD) equipment over the next few years to increase allowable running hours over the period to 2015. This capacity has been rewarded with higher EU ETS allowances than non-FGD capacity, helping to pay for this investment.
- In Germany, RWE is proceeding with the construction of a new 2.2GW lignite power station, and will be awarded allowances under the EU ETS due to the allocation methodology that Germany has adopted.

If the supply-side response to the EU ETS has been limited thus far, has the scheme had a significant effect

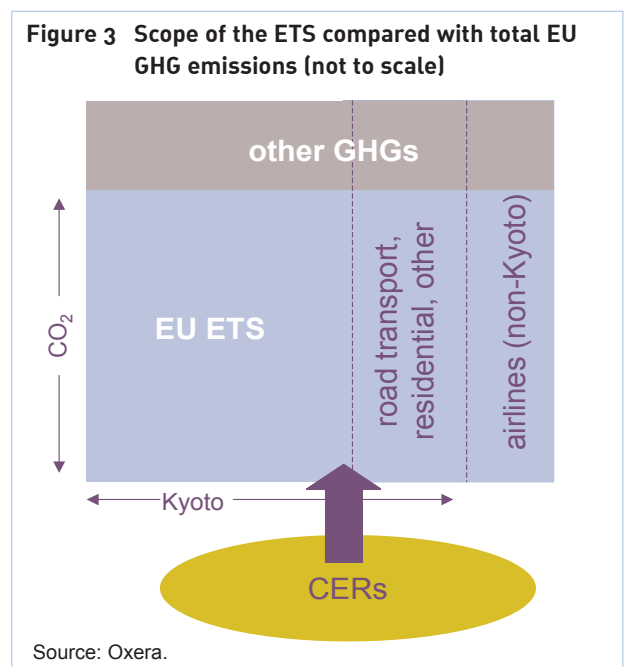
on the demand side? The demand-side response has been limited in part by measures that prevent the full marginal cost of carbon being passed through to end-users. In France, Spain and Italy, wholesale and retail power price regulation has prevented full pass-through of marginal carbon costs through price caps.

In the UK and Germany, the wholesale price appears to largely reflect the costs of carbon. A carbon price of €15/tonne raises the UK power price by around £3.50/MWh (since gas is largely at the margin) and, in Germany, by closer to €13/MWh (where coal is at the margin).<sup>12</sup> The impact on domestic bills has been an increase of perhaps 3–5%, although the effect on industrial electricity prices has been greater. In the short term, this could reduce demand by around 1%, but the effect is likely to grow over time. While this may lead to real carbon abatement, it is also a painful way of cutting emissions since customers may need to face very high bills to engender changes in behaviour.

### Future issues

What lies ahead for the EU ETS? Two likely developments are extensions to the scheme and greater harmonisation of cap-setting and allocation rules between Member States.

Figure 3 illustrates the current scope of the EU ETS relative to total EU GHG emissions. At present, the scheme only covers CO<sub>2</sub>, and it excludes sectors such as road transport, some industrial sectors (such as chemicals), and domestic emissions, which are included in the scope of the Kyoto Protocol. The EU ETS also excludes airlines, which are outside the scope of Kyoto.



The European Commission is currently working on including airlines in the EU ETS, and eventually extending the scheme to cover additional GHGs. While this may reduce the problem of carbon-abatement measures being lost in the 'gap' between the EU ETS and Kyoto, it may also test the political acceptability of the scheme if extensions contribute more to demand for abatement than they increase the supply.

## Conclusions

Considerable progress has been made in the past three years in establishing a market for carbon abatement in the EU. Three measures can be taken to help ensure the continued credibility for the scheme.

- First, the European Commission needs to be seen to act against Member States whose NAPs are not compliant with the Directive; otherwise the Phase II price may collapse in a similar way to that of Phase I.

- Second, progress needs to be made on harmonising rules for allocations for Phase III.
- Third, the scheme looks set to be widened to take in other sectors and other gases, narrowing the gaps between overall GHG-reduction targets and the scope of the EU ETS.

Even if these three actions are taken, there may well be a limit on the EU ETS price which Member States find politically acceptable. The German power market seems to be the focus of a key political sensitivity since it is driven by carbon-intensive coal. If other countries such as the UK want to push for further GHG reductions, they may have to continue to explore additional policy mechanisms to work alongside the ETS.

**Martin Brough**

<sup>1</sup> European Commission (2006), 'EU Emissions Trading Scheme Delivers First Verified Emissions Data for Installations', press release IP/06/612, May 15th.

<sup>2</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

<sup>3</sup> See [http://www.europeanclimateexchange.com/index\\_flash.php](http://www.europeanclimateexchange.com/index_flash.php).

<sup>4</sup> Figures based on ECX (2006), 'How to Trade ECX Products on ICE Futures', August.

<sup>5</sup> Figures based on European Commission, ECX and Oxera calculations.

<sup>6</sup> Oxera calculations.

<sup>7</sup> European Commission (2006), op. cit.

<sup>8</sup> European Commission (2005), 'Further Guidance on Allocation Plans for the 2008 to 2012 Trading Period of the EU Emission Trading Scheme', Communication from the Commission, December 22nd.

<sup>9</sup> Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms. See also European Commission (2004), 'Climate Change: EP Vote Paves the Way for Global Fight Against Climate Change', press release IP/04/505, April 20th.

<sup>10</sup> Oxera calculations.

<sup>11</sup> Oxera calculations.

<sup>12</sup> Oxera calculations.

If you have any questions regarding the issues raised in this article, please contact the editor, Derek Holt: tel +44 (0) 1865 253 000 or email [d\\_holt@oxera.com](mailto:d_holt@oxera.com)

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