



Making business sense
of climate change

EU ETS Phase II allocation: implications and lessons



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Preface

The European Emissions Trading Scheme (EU ETS) is the backbone of European efforts to tackle climate change, and a central instrument for countries to deliver their Kyoto emission targets. In setting a price for carbon, it has also become the focal point for industrial interest - and in some cases concern - about the impact of measures to tackle climate change.

The UK Government's Energy Review concluded that 'a carbon price is essential for making lower carbon emissions a business imperative...' and established the EU ETS as a centrepiece of UK energy and climate change policy, with 'the Government committed to there being a continuing carbon price signal which investors take into account when making decisions. The EU ETS is here to stay beyond 2012 and will remain the key mechanism for providing this signal.'

The extent to which the EU ETS can deliver on these lofty goals - and the carbon price that participating sectors will see over the next few years - hinges first and foremost upon the

allocation of emission allowances. Over the past eighteen months, governments around Europe have developed their 'National Allocation Plans' for its second phase - the Kyoto first period of 2008-12. Negotiation with their own domestic business and other constituencies defined their initial proposals; for most, attention subsequently turned to the European Commission, after its first round of decisions cut back all but the UK's allocation plan.

As the process for allocating Phase II allowances approaches completion, the Carbon Trust is publishing this report to analyse both the implications for the Phase II carbon market (and the resulting industrial abatement incentives), and also the wider lessons to be learned from the allocation process. As with our previous EU ETS report¹, it draws upon research conducted by Climate Strategies, with detailed supporting material published as academic papers.²

¹ *Allocation and competitiveness in the EU ETS: options for Phase II and beyond*, Carbon Trust, 2006. See also *The European Emissions Trading Scheme: Implications for industrial competitiveness*, Carbon Trust, 2004.

² www.climate-strategies.org; results of Phase II NAP analysis published as three papers in *Climate Policy*, Vol.6 no.4., www.climatepolicy.com

Executive summary

The EU ETS has emerged as the primary instrument for reducing CO₂ emissions across power generation and heavy industry in Europe. By setting a price on carbon, it aims to generate incentives for companies both to reduce their operational emissions and to invest in lower carbon technology. The allocation plans now agreed for Phase II (2008-12) make it likely to succeed in the first aim, but not the second. The incentives for low carbon investment could still be improved if governments auction more of the Phase II allowances, and define carefully the longer term structure of the scheme.

Phase II allocations and price impacts

During 2006, twenty-seven EU Member States proposed 'National Allocations Plans' for distributing allowances to emit CO₂ under the EU ETS during Phase II (the Kyoto first period of 2008-12). The plans proposed would have enshrined an increase in EU ETS sector emissions to 5% above verified 2005 levels. This exceeds the trend of historic emissions and, combined with inflow of emission credits from emission-reducing projects outside Europe (mainly certified emission reductions under the Kyoto Protocol's Clean Development Mechanism), would probably have led to a virtually 'dead market'.

The European Commission ruled that almost all the submitted plans violated its interpretation of the EU ETS Directive, and proposed an allocation formula that in aggregate turns the proposed 5% increase into a 5% decrease below 2005 levels. The key criteria were Kyoto constraints in most of the EU-15, and the imposition of a growth and

intensity formula based on independent sources for most of the new Member States. The total is below emission trends and all 'business as usual' forecasts, and in winning the ensuing political struggle, the Commission decisions have thus established EU ETS Phase II as a viable carbon market for 2008-12.

The forward trading carbon price for Phase II has remained steady in the range €15-20/tCO₂, but the realised price will be highly uncertain. A low gas price or high availability of international emission credits would yield a "floor" price, which might be underpinned by a Chinese tax on its CDM credit sales, currently around €8/tCO₂. Opposite conditions could generate prices over €20/tCO₂; this appears less likely, though much higher price spikes are not impossible. The option to bank allowances forward into Phase III (post 2012) will also support prices, whilst making them more dependent on the progress of international negotiations.

Implications for abatement and investment

A positive carbon price will drive some abatement, as it did during 2005-6, particularly in power generation and cement manufacturing. The incentive to abate may be weakened in countries and sectors that have allocated allowances in proportion to historic or projected emissions, if companies expect this approach to be carried forward to Phase III. Greater cutbacks combined with more 'benchmarking' particularly in the power sector in Phase II have lessened but not eliminated this risk. Nevertheless, prices below €20/tCO₂ are intrinsically insufficient to drive much investment in low carbon power sources, and may have modest impact on energy efficiency outside the energy intensive sectors.

Moreover, most allocation plans withdraw allowances from plants upon closure, and offer free allowances to new entrants. The former discourages closure of old inefficient plants and the latter partially protects new entrants from the impact of CO₂ prices. In many allocation plans, the new entrant rules give more free allowance to more carbon intensive fuels; the German plan gives even more to the most polluting (lignite power plants). This implicit subsidy creates perverse incentives to construct new, high emitting facilities that would last for decades.

In many countries the '*devil in the detail*' thus risks making Phase II of the EU ETS largely ineffective as an instrument to support low carbon investment (as opposed to operational emission savings).

Improvements and ways forward

To some degree, the various problems identified can still be fixed by (a) greater use of auctioning and (b) rapid progress to clarify a better basis for Phase III allocations.

Despite most plans cutting back allocations to power companies much more than other sectors, the power sector overall across Europe will make net profits from the EU ETS amounting to tens of billions of Euros during Phase II, through its impact on power prices. The current NAPs only

propose a trivial volume of auctioning (around 1.5%) but governments retain flexibility and can still decide to auction more. The much higher degree of auctioning proposed in the emission trading schemes being developed in the US will also increase pressures in the EU. Where the power sector is profiting, greater auctioning would not increase power prices but it could help to improve incentives for low carbon investment in three ways: by reducing some of the perverse incentives noted; through judicious use of auction revenues to support such investments; and by enabling a reserve auction price that would help to stabilise price expectations. More auctioning would also intrinsically stabilise the system.

The biggest measure that could help the EU ETS as an incentive for low carbon investment would be to pay as much attention to the details and investment incentives in Phase III, as the Commission paid to volumes in Phase II, and to clarify some basic common principles through the Review being conducted this year. Some key principles have been elaborated in our previous publication.³

The first phase of the EU ETS successfully established the EU ETS as a functioning market across all the Member States, delivered significant abatement and generated awareness of the climate change issue at the highest levels in European industry; these were hugely important achievements. The outcome of the allocation process for Phase II has largely succeeded in dealing with the fundamental problem of over-allocation that was evident in Phase I, but at the expense of allowing through detailed provisions that undermine the incentives to invest in low carbon technology. Phase III will have to tackle these challenges, if the EU ETS is to deliver successfully on both its objectives.

³ Carbon Trust, *Allocation and competitiveness in the EU ETS: options for Phase II and beyond*, 2006.

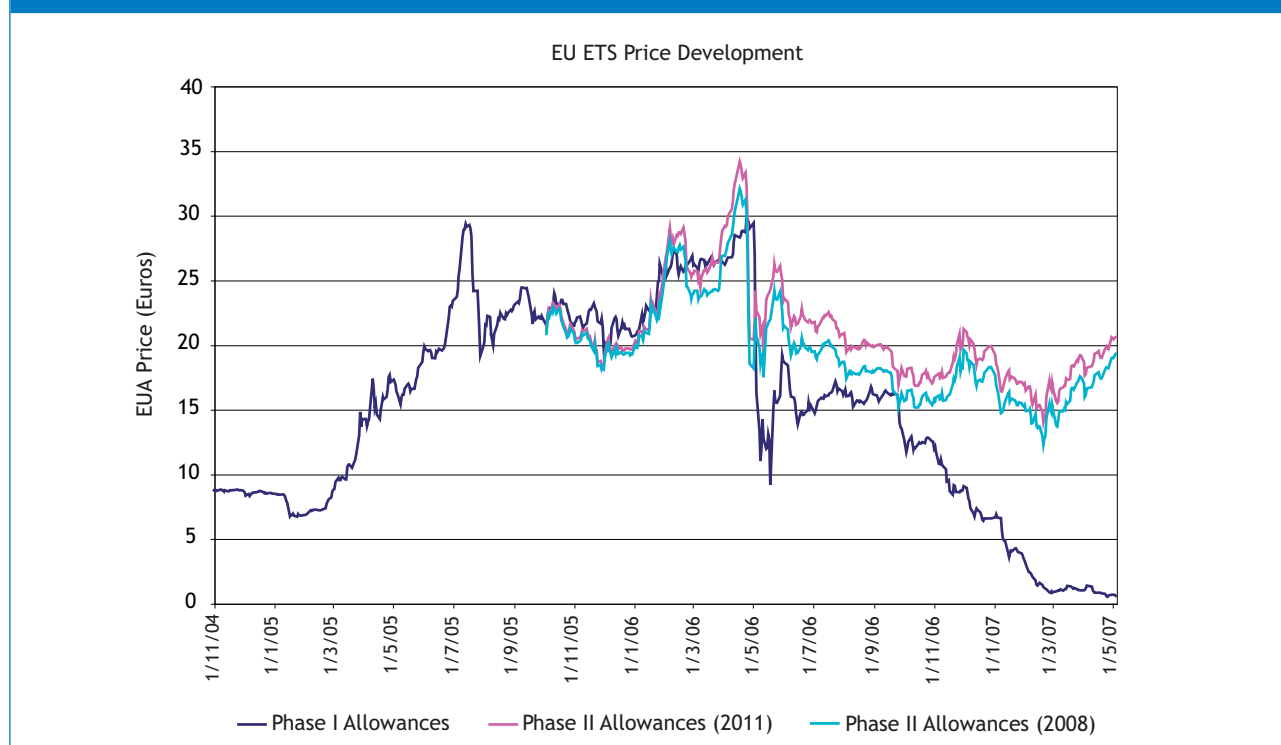
1. The bumpy ride of the EU ETS

History may judge 2006 as the defining year for the EU ETS. It started with prices for Phase I (2005-7) carbon emission allowances trading at levels higher than anyone predicted, and governments confidently issuing draft National Allocation Plans (NAPs) for how they intended to allocate allowances for Phase II, the Kyoto period of 2008-12. The year ended with Phase I prices sinking close to zero, and several countries threatening to take legal action to overturn the European Commission's rejection of almost all the submitted NAPs as inadequate. It was certainly a year of vast learning - as befits the middle of the first, learning period of a major new system.

The evolution of carbon prices for both Phase I, and Phase II forward trading, is shown in Chart 1.

Concerns from some commentators about overall shortage in Phase I proved groundless, when in May 2006 the release of data on verified emissions for 2005 showed a substantial surplus. The price halved overnight, and as the situation clarified over subsequent months, it sank further. The final tally showed that emissions in 2005 were about 100Mt (5%) below the allocated amount, and shortly after the new year Phase I allowances became essentially worthless. Preliminary data for 2006 show that emissions increased, but nothing like enough to absorb the excess supply of allowances.

Chart 1. Price of CO₂ in €/tonne



Source: EEX

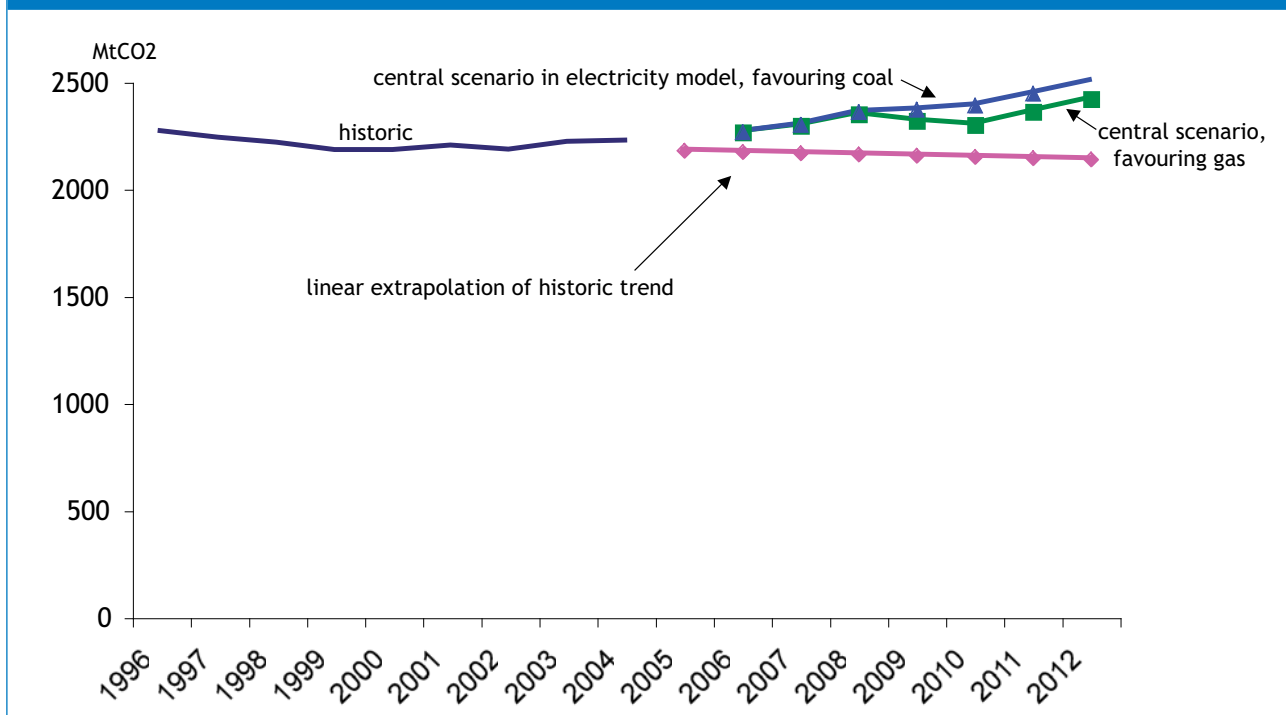
It was against this roller-coaster backdrop that countries sought to define emission allowances for Phase II, the Kyoto period of 2008-12. There was a great deal at stake. The EU ETS in Phase II was central to meeting Kyoto Protocol targets. But Phase I had shown the huge potential financial value of emission allowances - against a background of prices exceeding €20/tCO₂, it was plain that governments were allocating assets worth probably more than €200bn in total. Not surprisingly, they were subject to huge lobbying pressures.

Under the terms of the EU ETS Directive, the European Commission is empowered to reject NAPs if they do not meet certain criteria laid out in the Directive, relating to the avoidance of surplus allocations and consistency with Kyoto targets. However, the data on verified 2005

emissions were published only six weeks before the official deadline for submitting proposed Phase II NAPs to the European Commission - clearly insufficient to consider a wholesale revision of allocation approaches.

To set the Phase II allocation debates in context, Chart 2 shows the historic trend of emissions from the EU ETS sectors, together with projections. Total EU ETS sector emissions had declined slowly in the latter half of the 1990s, mostly as a result of continuing moves towards gas in power generation and industrial restructuring including the tail-end of the transition process in the new Member States of eastern Europe. The decline halted in the first half of this decade as these factors petered out, and rising gas prices pushed power generators back towards coal.

Chart 2. EU ETS sector emission trends since 1996 and 'business-as-usual' projections for 2008-12



Source: Climate Strategies / Neuhoff et al., (2006).

In the absence of any CO₂ controls, all projections suggest a slight increase in emissions, sharply at odds with the EU-15 Kyoto targets and the wider requirement to tackle climate change. The NAPs initially proposed for Phase II mostly offered modest cutbacks relative to projections of sharply rising emissions - but in aggregate, would have resulted in an increase of around 5% relative to the verified levels of 2005 after correcting for differences in coverage.

This was not only inconsistent with the EU's aggregate target, it would also have left a precariously thin margin below 'business-as-usual' emission projections. Depending upon assumed relative energy prices (gas vs coal, as illustrated) and the inflow of emission credits from abroad - as discussed in the next section - the EU ETS could have been rendered almost impotent for the whole of Phase II, requiring hardly any real abatement.

Faced with this risk, and an emerging view that most of the NAPs violated principles laid out in the Directive, on 29 November 2006 the Commission announced a momentous decision. In evaluating the first 11 allocation plans (10, after the French government withdrew its plan a few days before), it rejected all but the UK's as inadequate.

In fact the Commission went further than this. It clarified its interpretation of the Directive in terms of specific total allocations that would be deemed acceptable, linking allowed allocations to two main factors. The first was an explicit numerical formula that total allocations could not exceed 2005 levels multiplied by projected economic growth, corrected for trends in energy intensity (energy per unit of economic output). Moreover, the economic growth projections and energy intensity corrections were taken from

international (EU) sources, not those that Member States themselves presented. The second was a correction to ensure that allocations were consistent with Kyoto targets, after taking account of other aspects of Member State implementation plans including provisions for purchase of international Kyoto credits.

Under the terms of the Directive, Member States had three months to appeal against the Commission's decisions. By announcing decisions on such a big group of countries simultaneously, the Commission raised the stakes enormously. Any country that challenged its ruling - as the German Economics Minister initially threatened to do - would essentially be disputing the underlying interpretation of the Directive, which had been applied consistently across all countries; and would thereby open the floodgates for all to appeal. This would have locked up the EU ETS in legal disputes from which it would probably never have recovered - certainly not in time to be of much use to investors wanting to know the rules for Phase II.

Threats of legal challenges slowly dissipated, and as the deadline for appeals on the first round of decisions passed, the Commission turned to the other allocation plans, final decisions on most of which were announced by the time of this report going to press. In aggregate, the Commission's decisions cut total allocations in Europe by 10% as compared with the submitted and draft plans - turning a proposed aggregate *increase* of 5% from 2005 levels into confirmed allocations 5% *below* 2005 levels. The final allocations total almost exactly ten billion tonnes of CO₂ over the period - two billion tonnes annually. The next two sections discuss first, the implications for the Phase II carbon market; and then, the pattern of allocations across the different Member States.

2. Implications for the carbon market

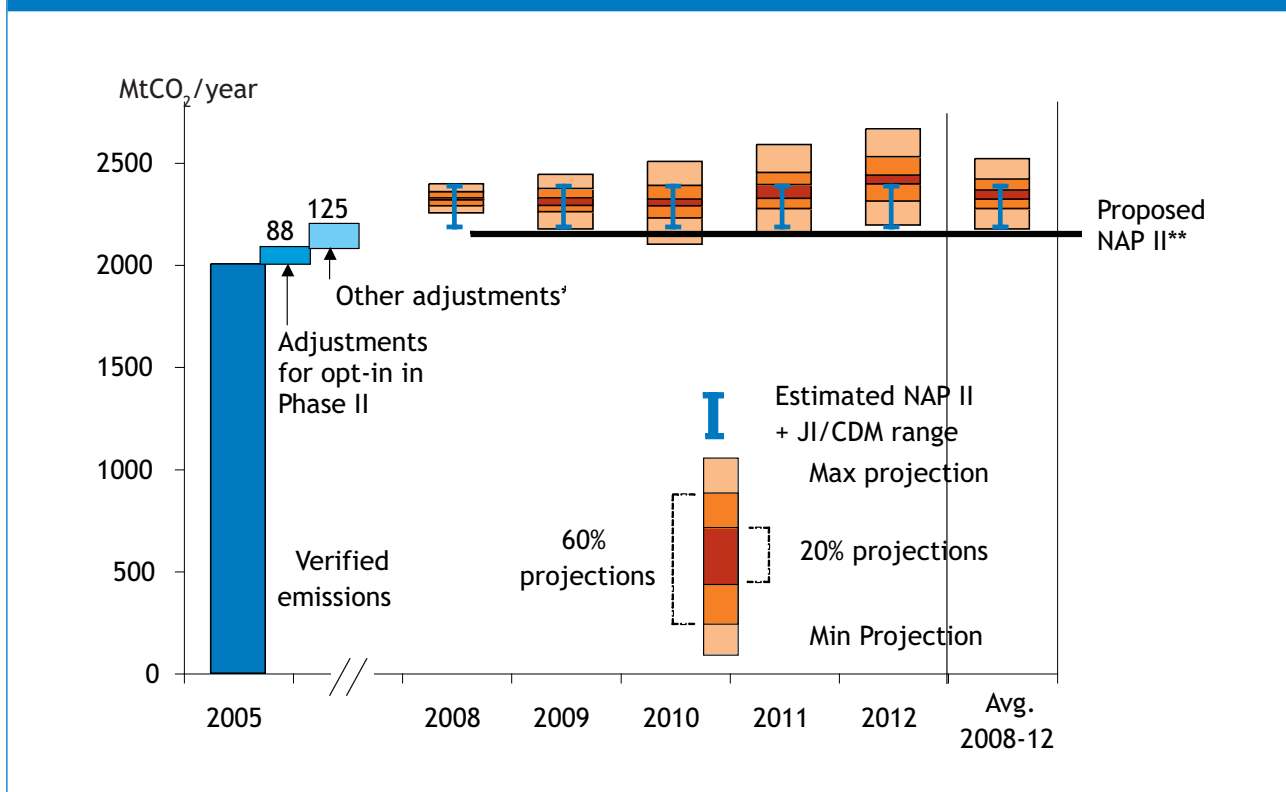
What do the final allocations imply for the EU ETS market in Europe? One surprise is that the forward trading market for Phase II allowances barely flickered as the Commission imposed its cutbacks on Phase II allocation plans, and as the Phase I market slid towards zero: the forward price for 2008-12 remained steady in the range of €15-20/tCO₂. Having seen the weakness of the submitted allocation plans and analysis from several sources making a powerful case that the allocations were far too weak, it appears that the market was already expecting the Commission to intervene forcefully, and that it did so roughly in line with market expectations.

The steadiness of Phase II prices also reflects the impossibility, even with the aggregate NAPs settled, of knowing what the price will actually

be. This is due to several major uncertainties, on both demand and supply side of the carbon market.

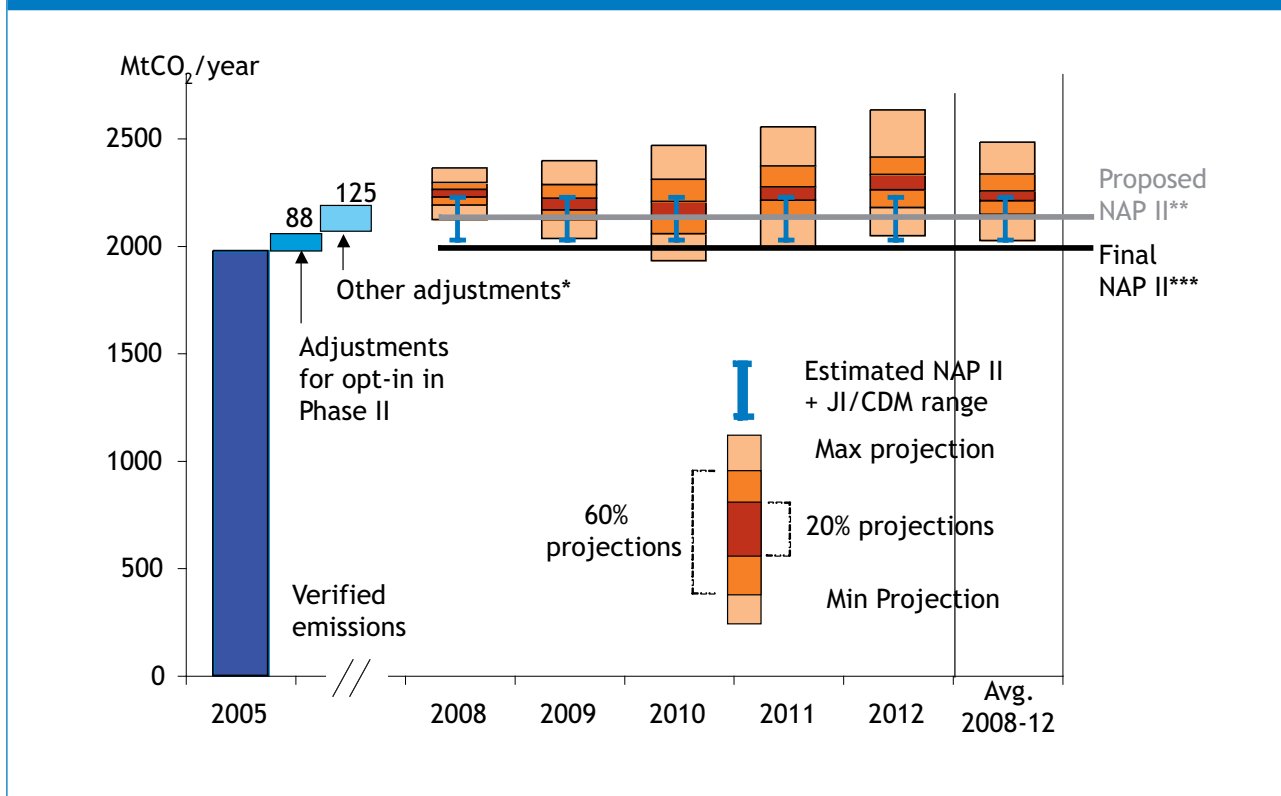
GDP growth or gas prices lower than central projections would tend to reduce emissions, and *vice versa*. Chart 3 shows how these uncertainties around fuel prices and GDP growth may affect potential demand, in terms of projected emissions (a) without any carbon price, and (b) taking account of the likely impact of a carbon price of €20/tCO₂ on power sector emissions from fuel switching (which would be the dominant, though not only, source of abatement within Europe). Weather (rainfall for dams, windiness, and temperature impacts on heating demand) is also relevant.

Chart 3a. Projected 'business-as-usual' CO₂ emissions versus EU ETS Cap (assuming zero CO₂ price)



* See original source (Neuhoff et al, 2006, *Emission projections 2008-2012 versus NAPs II*)

** Includes opt-ins and extensions

Chart 3b. Projected CO₂ emissions versus Cap for €20/tCO₂ price

* See original source (Neuhoff et al, 2006, *Emission projections 2008-2012 versus NAPs II*)

** Includes opt-ins and extensions

*** Includes opt-ins and extensions. Values are estimated for the final caps for Italy, Estonia Finland, Hungary, Portugal and Denmark, taken from <http://www.econ.cam.ac.uk/research/tsec/euets/>. Cyprus Romania and Bulgaria are excluded.

In most of the underlying scenarios, a €20/tCO₂ carbon price cuts power sector emissions by around 130Mt/yr (the exception is very high gas prices in which case €20/tCO₂ is insufficient to lead to much fuel switching). Even with generous allowance for other abatement (eg. in the energy-intensive industrial participants, and more widely through reduced electricity demand), the total abatement at €20/tCO₂ would be under 200Mt, or 10% of the total. This is comparable to the 'central' span of emission projections arising from varying just economic growth and fuel prices within reasonable bounds, even from this single set of projections - and much less than the total uncertainty in emission projections.

An additional and crucial source of uncertainty is the *supply* of additional emission credits, primarily Certified Emission Reductions (CERs) from projects in developing countries under the Clean Development Mechanism, which companies can use towards their compliance with EU ETS

commitments. The high carbon price of 2005-6 stimulated explosive growth of such projects, with almost two billion tonnes of such emission reductions (cumulative up to 2012) now submitted for registration with the relevant international authorities (the CDM Executive Board that operates under the Kyoto Protocol). With growing supply also from Joint Implementation projects in eastern Europe, the total grows monthly and is expected to top three billion of CO₂-equivalent.

By no means are all of the projects submitted likely to generate Certified Emission Reductions (CERs) at the scale and timescale projected in registration documents. In addition, others will be competing for supply. The Japanese electricity and steel sectors have already made major purchases in pursuit of their 'voluntary' commitments. Based on current domestic policies and measures, both Japan and the EU-15 face a gap between national emissions and their Kyoto targets exceeding 1 billion tonnes each over the

Kyoto period, and government purchase of CERs are expected to be a major tool of compliance. Indeed, as part of its EU ETS approval process, the Commission demanded proof of national acquisition plans sufficient to bring countries into compliance, and EU governments have already contracted several hundred million tonnes. The net availability to EU industry of fully certified emission reduction credits thus remains uncertain, though most estimates place it at several hundred million tonnes - probably in the range 100-200Mt/yr on average over the period. The T-bars on Figure 3 illustrate the impact of this additional supply.

This range is comparable to the total internal EU ETS mitigation potential at around €20/tCO₂, and as indicated on Chart 3 (a and b), is comparable to the central range of emission projections. To try and protect the EU ETS against a risk of excessive inflow of emission credits, Member States have (as required in the Directive) proposed limits on the volume of imports that any facility can use. The Commission decisions greatly narrowed the range between different countries, with most of the big ones now limiting the use of external credits to 10-20% of an installations' total allocation. These limits seem unlikely to bind many, though they could constrain some power sector installations that might otherwise want to burn coal and import credits as their only compliance strategy. Overall however, CDM supply will be intrinsic to the balance of the market.

Against this combined background on supply and demand, the original set of allocations posed a major risk of a "dead" market, with 'business as usual' emissions below allocations plus existing committed external supplies. The crucial impact of the Commission's decisions has been to change this prospect from being very likely, with the draft NAPs, to being extremely unlikely, as the final allocations lie well below the extreme lower end of the range in Chart 3(a), leaving a clear need for some combination of abatement and credit imports.

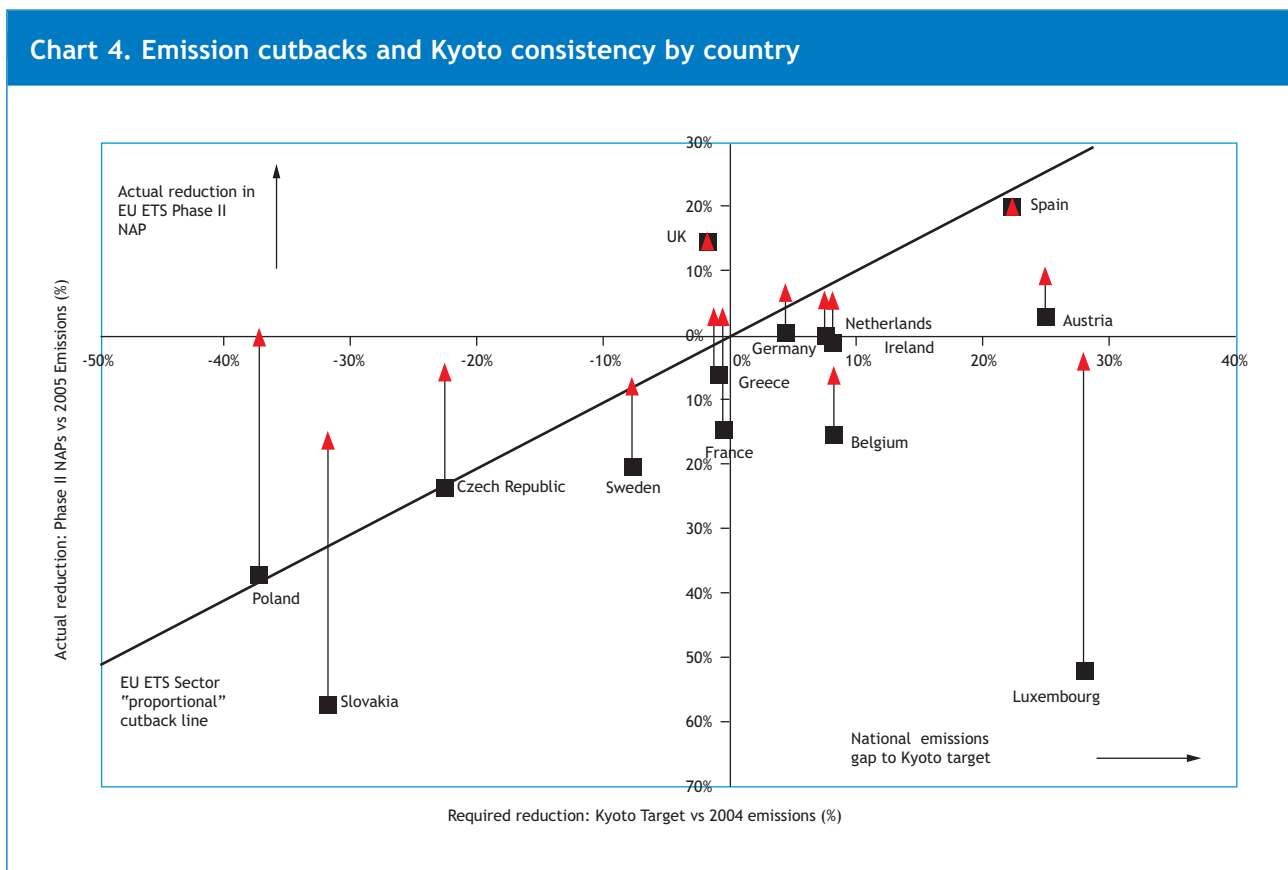
In the last couple of years, China has dominated CDM supply and introduced a tax on CDM credit sales that effectively sets a floor price currently around €8/tCO₂. This situation could well continue. With net supply at the higher end, and/or demand at the lower end, this would set a price floor on the EU ETS. The ability to 'bank' allowances from Phase II forward into Phase III could also support prices, whilst making them also dependent upon the potentially volatile progress of negotiations on post-2012 commitments. At the opposite extreme, restricted availability of external emission credits and, in particular, high gas prices could drive the price significantly above €20/tCO₂. One consultant's report⁴ offered a range of €8-26/tCO₂ for the average Phase II price - but only assigned a 50% probability of the price being in this range. The allocations may be (virtually) settled, the prospect of a completely "dead" market largely removed, and the Phase II forward price steady; but the reality remains one of huge uncertainty about the actual evolution of carbon prices out to 2012.

4 New Carbon Finance - EU ETS Deep Dive analysis, 15 Jan 2007

3. Distribution and Kyoto compliance

The other major impact of the European Commission decisions has been to greatly reduce disparities between the different National Allocation Plans, and to bring them much closer to consistency with national Kyoto targets. This is apparent from Chart 4, which shows for each country the % cutback relative to 2005 levels (vertical axis), against the % cutback in national emissions from recent levels required for a country to meet its Kyoto target domestically

(horizontal axis). The diagonal line indicates the “proportional share line”, i.e. if the emission reductions for ETS sectors were proportional to the national total cutback implied by Kyoto targets. For each country, the triangle shows the final outcome; the square indicates the proposal in November 2006, in the allocation plan submitted to the European Commission or (in some cases) published but not yet officially submitted.



Note. For each country, the vertical axis shows the % cutback in NAPs from verified 2005 emission levels in the EU ETS sectors. The horizontal axis shows the national % difference between 2004 total emissions and national Kyoto targets. Consequently, the diagonal line shows the “proportional share line” if EU ETS sectors (which typically make up 40-50% of total national emissions) are cut back in proportion to the Kyoto target. The square at the bottom of each vertical bar shows allocations proposed as of November 2006; the triangle at the top shows the final outcome. Decisions for Italy, Estonia, Finland, Hungary, Portugal, Denmark, Cyprus and the two new Accession countries (Romania and Bulgaria) were not finalised at time of going to press. Italy accounts for about 10% of EU emissions; the others collectively about 15%.

Source: The Carbon Trust

The Chart reflects two main themes in the battle over allocation plans in Europe. The first concerned allocation in the EU-15 countries, principally the western and southern European countries most of which are falling short of a path towards their Kyoto targets. The UK, the biggest exception to this pattern, had submitted a relatively ambitious allocation plan and the draft Spanish plan proposed even bigger cutbacks. The definitive battle was around Germany, by far the biggest single emitter, accounting for 24% of EU emissions in 2005 and therefore a dominant influence on the market overall.

Germany was one of few countries to submit its allocation plan on time. Shielded by the fact that Germany was not far from its Kyoto target, the total allocation proposed was virtually identical to its 2005 emissions. Many other Member States adopted allocation plans that echoed the 'light touch' of the German proposal, in many cases proposing significant increases.

It was widely assumed that the European Commission would not dare to challenge Europe's biggest power, but with many others implicitly hiding behind the weakness of the German plan - and with the UK immediately countering with a far stronger UK allocation proposal - the Commission reached its decision to adopt a formula approach that inevitably would involve rejecting the German plan. The German government reacted strongly, but the Commission had judged not only that it had little choice, but also that during a year of holding both the G8 and EU Presidencies, Germany would not want to be locked in a legal dispute over its unwillingness to offer real cutbacks in the EU ETS. As the deadline for challenges passed, Germany withdrew its threat of legal action and, without that cover, so did other Member States.

The net effect of the Commission winning this political struggle - apart from saving the EU ETS as a credible market - was to align most of the core group of EU-15 countries close to the 'proportional share' cutback. For a key group - Germany, France, Greece, Netherlands, and Ireland - this moved them to significant cutbacks relative to 2005. Sweden, Belgium and Luxembourg were also moved to within a few

percent of 2005 levels, in place of generous growth allocations.

The effort to strengthen NAPs faced a different kind of issue in the new Member States, the ten countries of eastern Europe that had joined the EU in 2004. These countries were all (except Slovenia) easily on track to comply with their Kyoto obligations, thanks to the decline in emissions far below 1990 levels in the aftermath of economic transition. Here, the other element of the Commission's formula - the cap relative to verified 2005 emissions adjusted for economic growth and energy intensity changes - came to the fore. In some cases, notably for Poland, Slovakia and the Czech Republic, this imposed dramatic cutbacks on their plans. To some degree, this turned out to be a struggle over the meaning of Accession to the EU itself. Some from the new Member States implied that they should be treated more leniently, with generous allocations (in the absence of Kyoto constraints) perhaps as compensation for their lower GDP and rapid growth. The Commission insisted that all EU Members had to abide by common rules and expectations. Again, the Commission won, resulting in modest increases allowed roughly in line with expected economic growth after adjusting for continuing trend improvements in these countries energy efficiency.

The result all round is to set national aggregate allocations on a much more 'level playing field' across Europe than in Phase I.

4. The devil in the details

In terms of both aggregate impact, and distribution, the Phase II EU ETS is thus much improved, but the devil remains in the details. In particular, some of the problems risk substantially undermining the EU ETS as a way of providing clear and consistent incentives for business to make lower carbon investments. The main areas of difficulty are: the difference between allocations to the power sector and other sectors; discrepancies and mixed incentives in rules for distributing allowances to existing installations; closure rules, and the potential perverse incentives arising from special rules for closure and new entrants.

In most countries, the allocation cutbacks are imposed almost exclusively on the power sector. With modest cutbacks overall, the logic for this is compelling: it attempts to mitigate the fact that in countries with competitive electricity markets, power companies pass on the “opportunity” cost of carbon and thereby generate large net profits at the expense of their customers - including other sectors in the EU ETS. Unfortunately the tendency to give energy intensive sectors almost everything they project they need, in an attempt to compensate for this, weakens the incentive effect. In economic theory, the companies will still have an incentive to abate so as to sell allowances. The Phase I experience suggests that the extent to which they do so in practice is very varied. If they get all the allowances they need, they may just continue with ‘business as usual’ behaviour, rather than trying to optimise - particularly if they believe that investments in lower-emitting technologies may just result in them receiving fewer allowances in subsequent phases. This is the “early action/updating”

problem which could thereby become a more general disincentive, particularly for investment decisions that might only be fully realised towards 2012.

This points to the second area of difficulty, namely the “distortions” that can arise from repeated rounds of free allocations. Our previous research identified a “pyramid of distortions” depending upon how allowances are allocated. At the bottom, distortions are greatest if companies expect to receive allowances in proportion to recent historical emissions. Allocating allowances in proportion to emission projections or historical output is only a little better. Various “benchmarking” approaches can reduce the distortions, but to an extent that depends on the details of how they are defined. The purest approach (apart from auctioning) is “benchmarking” based purely on installed capacity, not differentiated according to the plant type or its projected output.

Chart 5 summarises the approach taken in the different NAPs. For incumbent installations, the great majority use one of the two most potentially distorting approaches - allocating in proportion to historic or projected emissions for both power (P) and other (O) sectors. However, there are just enough countries experimenting with other approaches (eg. Austria, Belgium, Spain, Hungary and the UK) that Phase II will at least create sufficient experience to facilitate wider adoption of more efficient approaches in future phases. In addition, given the greater cutbacks in the power sector and the greater experimentation with benchmarking, this is a lesser problem where it matters the most, ie. power generation.

Chart 5a. 'Pyramid of distortions' arising from form of free allocation to existing installations, for power (P) and others (O)

| Benchmarking | Auction | | EU Member States | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------------------------------|----------|------------------|------|------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| | Uniform | Tech sp. | AT | BE-W | BE-F | BE-B | CY | CZ | DE | DK | EE | ES | FI | FR | GR | HU | IE | IT | LT | LU | LV | MT | NL | PL | PT | SE | SI | SK | UK | |
| Based on | Installed capacity Projections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Installed capacity Projections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Installed capacity Projections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Historic emissions | Projections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Historic emissions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Chart 5b. 'Pyramid of distortions' arising from form of free allocation to new entrants, for power (P) and others (O)

| Benchmarking | Auction | | EU Member States | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---------------------------|------------------|------------------|------|------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| | Uniform | Tech/ Fuel spec. | AT | BE-W | BE-F | BE-B | CY | CZ | DE | DK | EE | ES | FI | FR | GR | HU | IE | IT | LT | LU | LV | MT | NL | PL | PT | SE | SI | SK | UK | |
| Based only on | Installed Capacity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Projection for Production | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Installed Capacity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Production projections | Projection for Production | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Production projections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

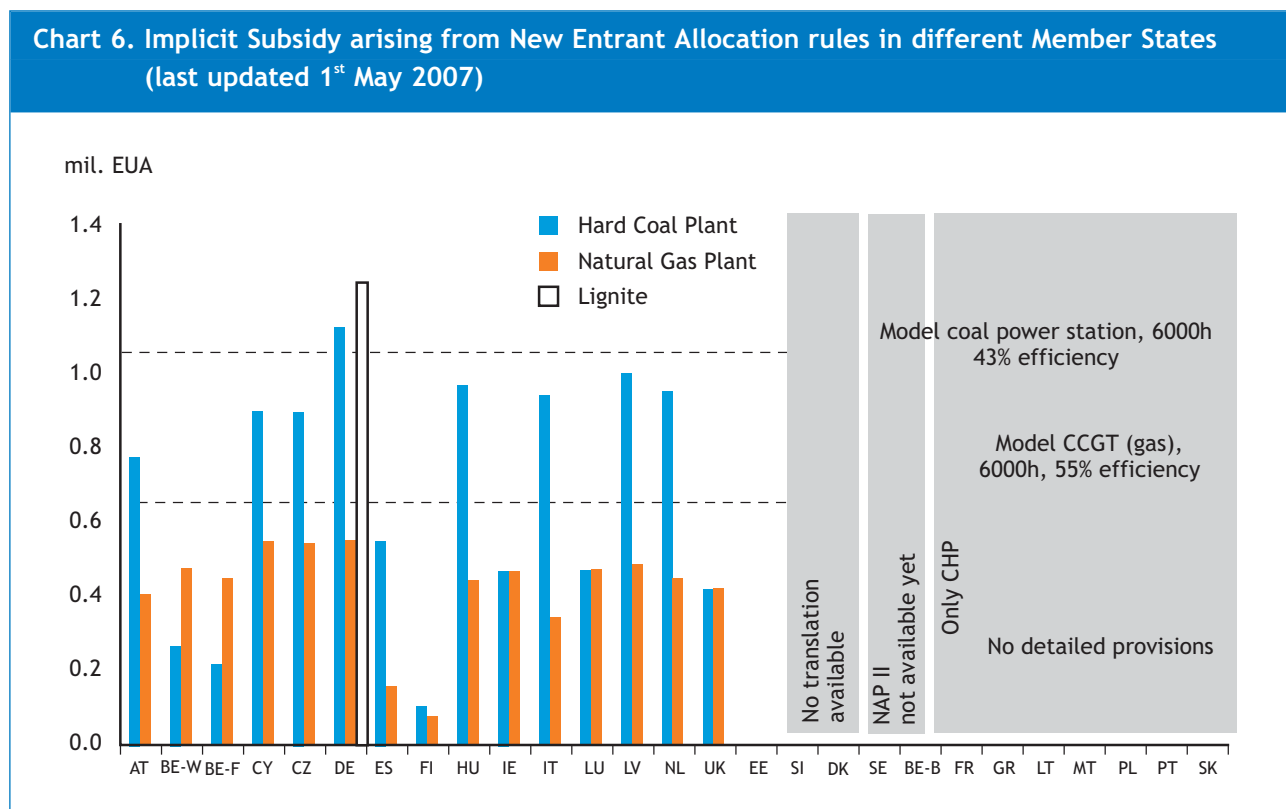
Note: AT Austria, BE-W Walloon, BE-F Flemish, BE-B Brussels, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, ES Spain, FI Finland, FR France, GR Greece, HU Hungary, IE Ireland, IT Italy, LT Lithuania, LU Luxembourg, LV Latvia, MT Malta, NL Netherlands, PL Poland, PT Portugal, SE Sweden, SI Slovenia, SK Slovakia, UK United Kingdom.

Source: Neuhoff et al. (2006).

By far the biggest potential for the EU ETS to generate perverse incentives is in the allocations to new entrants, through the “New Entrant Reserves”. The fact that new emitting sources get free allowances but zero-carbon power sources do not obviously weakens incentives to invest in the later. This problem is exacerbated by specific details in many of the plans. Most notably, the German NAP offers unlimited “technology

carbon investment, economically this amounts to a subsidy that increases for more polluting plant. Chart 6 shows that many countries offer such fuel-specific subsidies for new entrants, but Germany is unique in the scale of subsidy offered to the most polluting ones.

Essentially, what is happening here is that whilst the EU ETS was *designed* with the intent to



Note: The Chart shows the implicit subsidy of free allocations that would accrue to new coal and gas power stations of 200MW operating at the efficiencies indicate and that are assumed to run for 6000h. For country codes, see note to Chart 5.

Source: Climate Strategies / Neuhoff et al. (2006).

specific” free allowances to new power stations, so that coal power stations get about twice as many as gas, and adds a “load factor” correction, in which the most polluting plants (lignite) are granted an *additional* 10% more allowances, officially on the grounds that they are expected to operate more.

The intent of such provisions is to try and protect new investments from the price of carbon. But since the aim of the EU ETS is to reflect the social cost of carbon emissions and to incentivise low

reduce CO₂ emissions, in many Member States the details of implementation have been negotiated between industries and Ministries that had other objectives, and whose main priority was to minimise any resulting pressure on their industries to change: they appear to have regarded their job as protecting “business as usual” from the effects of a carbon price in Europe. In some countries, particularly concerning new investments, they succeeded to a remarkable degree.

5. Profits and the use of auctioning

The experience in 2005-6 confirmed predictions that the power sector in particular, where there are competitive power markets, passes through the opportunity costs of carbon emissions into electricity prices. This generates net profits; the continued high degree of free allocation in Phase II will generate power sector profits of several tens of billions of Euros across much of Europe.⁵

The extent to which other sectors can or will pass through opportunity costs and potentially profit in similar ways is more constrained, by international competition and by the fact that they face increased electricity prices without corresponding free allowances. With the continued high level of free allocation in Phase II, the net effect could be increased profits during Phase II for many sectors, but with potential to lose market share over time; this trade-off is being examined more fully in a separate study by *Climate Strategies*.

In addition to its distributive effects, as indicated the very high level of free allocation creates various incentive problems. Greater use of auctioning could alleviate several of these problems, and help to establish more cost-reflective prices than was evident in Phase I, which could also improve price stability.

Auctioning is a way of introducing allowances into the market. In general there is no such thing as auctioning 'to a sector', since who buys from auctions depends upon where governments choose to cut back free allocations in the first place. In practice, most of the cutbacks in Phase II allocation plans have been placed on the power sector. Given its profits from the system, this can

be seen as a way of distributing more fairly the economic 'rents' that are inherent in capping emissions. About 10 Member States currently plan to use some auctioning (compared to four in Phase I), though several of these only to cover administrative costs. Auctioning can also be seen as fundamentally implementing the polluter pays principle, and it raises revenue for governments which could be recycled creatively for example to ease the distributional inequalities or to publicly fund low-carbon investments.

The Directive limits auctioning in Phase II of the EU ETS to a maximum of 10% of issued allowances. In its high degree of free allocation, the EU ETS contrasts sharply with the emerging Regional Greenhouse Gas Initiative for the north-east US power sector. The RGGI scheme, which is due to start operating in 2009, requires a minimum 25% auctioning and several participating states are now planning to auction all their allowances (100%). However, none of the EU ETS allocation plans yet uses in full even the option to auction up to 10% of issued allowances.

Politically, in the aftermath of the Commission decisions it was not easy for Member States to introduce significant auctioning whilst also cutting back on their initially proposed total volumes. However the Commission's decisions on NAPs explicitly left the degree of auctioning, within the 10% limit, up to Member States; it does not require further approval. Therefore, under EU law Member States are free to increase the use of auctioning from presently proposed levels, and at the time of writing this remains a topic of intense debate in some countries.

⁵ For example, at a price of €15/tCO₂ and average emissions of 800g CO₂/kWh, power companies in Germany collectively would need to spend about €1bn/yr on allowance purchases (less if they can substantially cut back emissions), but would receive more than €5bn/yr from the electricity prices that result from the power market reflecting CO₂ opportunity costs. For an explanation see the Annex to our previous report (note 1). Such profit-making occurs in competitive markets, in which prices tend to reflect 'marginal costs' including the opportunity cost of carbon. In these cases auctioning makes no difference to the impact of the EU ETS on power prices. In EU countries that do not have competitive generation markets, regulators generally do not allow pass-through of opportunity costs. In these countries, more auctioning would impact on power prices, and would tend to level the playing field in this respect between the different regulatory structures.

In our previous work, we noted that setting a minimum reserve price to auctions in Europe could help to reduce price uncertainty and volatility, by providing a “base price” that could underpin low carbon investments. At present, the proposed volume of auctions in Europe is too small for this to be a significant influence. A move in Germany, with almost 25% of EU allowances, towards much greater use of auctioning could make this an operational possibility.

Most of EU industry has strongly opposed auctioning, though in some countries this position is softening as attention turns also to questions of how auction revenues might be used. The dilemma is that industry also wants long-term stability in the system. A structure in which one main sector extracts almost all the economic ‘rents’, at the expense of its consumers is inherently not politically stable. The better distribution of these rents between different stakeholders that is afforded by auctioning is probably key to longer term stability.

Beyond Phase II, the Directive places no constraints on the degree of auctioning. Exactly what happens is likely to hinge critically on the experience of Phase II. Given the inevitability of large profits for the power sector, and the extent of perverse incentives associated with free allocation as identified in the previous section, a much higher degree of auctioning seems not only desirable, but inevitable.

6. Lessons and a view to the future

The combination of learning from Phase I and the Phase II allocation process yields important lessons.

Allocations for Phase I - and the earlier stages of Phase II allocations - were made without a solid basis of good data for the covered facilities. Reliable, verified and comparable data are an essential input to robust allocation decisions.

Yet this does not explain the clear excesses in proposed allocation plans. A second lesson is the need for an independent authority (for the EU ETS, the Commission), that can act as a “policeman” to ensure that allocations accord with agreed criteria. Indeed the events of 2006 lead much further than this. The Commission’s political victory in the allocation struggle, introducing a formulaic approach to establishing acceptable volumes, represents a huge *de facto* step towards harmonising the allocation process in Europe, at least at the level of aggregate caps. The Member States have only themselves to blame for this: left to their own devices they proved collectively unable to offer allocations that would have delivered a meaningful carbon market, leaving no choice other than to centralise the cap-setting process.

However the Commission would have been powerless without the broad criteria agreed in the Directive, the basis upon which it made its interpretive decisions. In particular, the Kyoto targets were the essential tool that was wielded to ensure meaningful cutbacks. Not only was the Kyoto Protocol’s existence essential impetus to creating the EU ETS, but its specific targets proved to be the decisive tool in the battle to establish meaningful, if still modest, allocation cutbacks for European industry.

Some specific improvements are notable between Phase I and Phase II in the National Allocation Plans. Phase II Naps are generally more transparent, and in several cases simplified.

There is more use of both benchmarking and auctioning in Phase II - though in both respects, the improvements are modest. Indeed a general observation is the considerable inertia in the Member States, with the structure of many Phase II plans strongly reflecting their antecedents.

Nevertheless, combined with a general increase in market liquidity and the range of market services, these changes will make it easier for most companies to work with the EU ETS in Phase II, and make its operational efficiency considerably better. Indeed market surveys already report increasing levels of abatement as well as trading activities. The introduction of aviation into the scheme is another important development, with internal flights due to be incorporated in 2011 and international flights from 2012.

Thus the scope of the EU ETS is expanding and a credible carbon price will change operational decisions so as to reduce emissions. The striking limitation of the EU ETS as currently implemented concerns not this, but the weakness of incentives for lower carbon investments. That incentive is already limited by the relatively short term nature of current commitments and the corresponding lack of post 2012 certainty; but the problem is far bigger than this. The New Entrant Reserves intrinsically weaken the decarbonisation incentive by subsidising carbon intensive investments; and some plans, as noted, in practice promote the most polluting.

There is a general political lesson here. The major focus of debate has been upon *volumes and prices*, not the actual details that define individual *investment incentives*. The politics of implementation inevitably involve a risk of what social scientists call “regulatory capture”, in which industries effectively control their regulators; by establishing a close relationship particularly with industry ministries, they seek to adjust rules of implementation so that they can

carry on with ‘business as usual’, or better. That in essence is the story of Phase II implementation details in much of Europe. Increasing the role of auctioning could help, but if the EU ETS is to provide meaningful incentives for low carbon investment, these underlying issues will have to be tackled forcefully in Phase III.

During 2007, the European Commission is undertaking a comprehensive review of the EU ETS. Building upon this, during 2008 legislative proposals will be developed for its design after 2012. This process offers a crucial opportunity to fix the current weaknesses of the EU ETS in relation to low carbon investment incentives. A clear and prompt resolution of these issues will have immediate benefits, by demonstrably shifting the longer term balance of risks and rewards decisively in favour of lower carbon investments now.

A final issue arises from the distinction between the treatment of the power sector, which bears almost all the cutbacks, and others. This is for good reasons, but it hides a deeper issue. The dominant philosophy in the non-power sectors (as was the case for all sectors in many Phase I NAPs) is of “allocation for need” - the view that companies should get almost as many allowances as they project to be needed. This is a fundamentally different mindset from regarding the primary purpose of the EU ETS as being to set a price on emissions, and free allocations as being simply a temporary derogation to give time for industry to adjust to that reality, and perhaps to help address specific competitiveness threats.

The real risk of ‘allocating for projected need’ is that it explicitly shields companies from the reality of needing to adjust to a carbon-constrained world. In most cases it reflects a fundamental confusion between “ends” (to tackle climate change) and “means” (the EU ETS as a way of achieving that). European industry needs to move towards a low carbon economy. One way or another, facing up to a carbon price will be an essential part of that process.

Further information

The analysis in this report is based principally upon publicly-available research carried out by *Climate Strategies*, a European network organisation which convenes academic research on key issues in international climate policy. The Carbon Trust is a lead funder of *Climate Strategies* and their analysis of Phase II allocation plans is published in three main papers collected as part of a Special Issue of the journal *Climate Policy*, Vol.6 no.4:

- Karsten Neuhoff, Federico Ferrario, Michael Grubb, Etienne Gabel, Kim Keats, 'Emission projections 2008-2012 versus national allocation plans II'
- Regina Betz, Karoline Rogge, Joachim Schleich, 'EU emissions trading: an early analysis of national allocation plans for 2008-2012'
- Karsten Neuhoff et al., 'Implications of announced phase II national allocation plans for the EU ETS'

These papers contain details of all the numerical analysis summarised in this report. An Editorial overviews the findings in relation to the likely efficiency, distribution and environmental effectiveness of Phase II. Additional papers in this Special Issue cover related topics including the efficiency gains from trading in EU ETS Phase I, variations in Phase I new entrants, the economics of auctioning in the US RGGI scheme, and a review of energy forecasting errors and uncertainties. Individual papers are available from www.climatepolicy.com.

In addition, two main studies have now been published of lessons from the 2005 verification data. These include analysis of the extent to which the observed surplus (summarised in our previous report) was due to overallocation compared to abatement, and conclude it was some of each. These and many other research papers on the EU ETS are downloadable from the website www.climate-strategies.org/EUETS.

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