



Energy Viewpoints

Developing Energy Markets

Issue 13 – Winter 2007/2008

Developing Energy Markets

CONTENTS

- Pages 02 – 03** **Editorial from APX – Bert den Ouden, Chief Executive Officer**
- Pages 04 – 06** **Firmer Price Expectations for Phase Two and Beyond**
In terms of reducing CO₂ emissions, Phase One of EU ETS is seen as a failure but, according to Moffatt Associates' latest quarterly survey, market participants believe a viable trading mechanism has been established, lessons have been learned and prices in Phase Two could be firmer, depending on plans for Phase Three.
- Pages 07 – 08** **What Lies Ahead for The Carbon Market?**
According to Henrik Hasselknippe and Endre Tvinnereim of Point Carbon, what the European Commission decides for Phase Three of the EU ETS (2013-2020) will have important implications for the CO₂ price in Phase Two.
- Pages 09 – 12** **Risk Of Low Carbon Price**
According to Hugo Robinson of Open Europe, linking Phase Two of ETS with Kyoto credits generated outside the EU imports a level of price uncertainty that will be detrimental to the future low carbon investment in Europe.
- Pages 13 – 15** **Will We Learn From Experience?**
Between 2008-12 the market seems to be expecting a price of carbon in the €20/€30 per tonne range. According to Dr Anthony White and Coralie Laurencin of Climate Change Capital, it could be lower but there are reasons for expecting that in Phase Three prices will be higher than Phase Two.
- Pages 16 – 22** **European Energy Market Trends Survey – Winter 2007/2008**
This regular, quarterly survey, sponsored by APX and produced in association with EFET, summarises expectations about future energy market prices based on responses from 31 senior market participants, analysts and policy influencers from 10 countries across Europe. The survey is devised and conducted by Moffatt Associates, an independent research and energy market consultancy based in London.
- Pages 23 – 24** **APX News**
- Pages 25 – 26** **APX Indices**
Power and gas indices from APX.
- Page 27** **Disclaimer**

Carbon trading gaining momentum, but still needs better consistency to maximize price stability and carbon efficiency.



Dear Reader,

The first phase of the EU Emissions Trading Scheme (ETS) has received a substantial amount of criticism, much of which is directed at the EU Commission for allowing national governments to issue too many CO₂ allowances. However neither the creators of the scheme nor the market participants had any basic emissions data at the outset and so it is perhaps not surprising that the CO₂ price collapsed when more reliable data became available in late 2006.

Trading volumes have however, expanded sharply and it would seem that lessons have been learned and stricter caps have been imposed for Phase Two, so that in principle, the EU ETS starts 2008 with the expectation that demand will exceed supply and prices will firm. This in effect is what is required if there is to be any CO₂ reductions and investment in low carbon technologies. Our latest survey of market participants reveals that the majority believe that Phase One has established a viable cap and trading system which other countries should adopt and that EU carbon prices will be firmer – in the 20/30 euros per tonne range during Phase Two.

Meanwhile, there are more general concerns that CO₂ prices could be volatile. The international negotiations on the follow-up to Kyoto on subjects such as joint implementation are yet to be conducted and information from those negotiations could have a large influence on price perceptions.

As always with markets, there are some price risks related to uncertainties surrounding both supply and demand. On the supply side a big question mark hangs over the extent to which external CO₂ (CDM) credits will ►

imported into the EU thus reducing emissions in Europe and depressing prices. The market seems to think that the weakening impact will be limited and that there will be still a shortfall in the EU, which is likely to be met by fuel switching between coal and gas.

On the demand side, the issues are more complex and relate to the unknown impact of the weather (reducing power generation), the input of renewables and improvements in energy efficiency. The Commission has set out this year some very ambitious 2020 targets for GHG, renewables and efficiency, and if the fuel mix objectives are only partially met, it will have a depressing impact on the CO₂ price. This would be in climate change policy terms, counter-productive.

In my own opinion, two things remain to be solved. First, we have to find a solution for basic industries (steel, chemicals) in order to prevent those industries from being driven out of Europe. It is debatable to implement a scheme that only leads to a global shift of those industries towards countries without CO₂ obligations as this would increase the CO₂ output.

Secondly, we need to fully include Carbon Capture and Storage as a fully recognised carbon reduction technology. The current uncertainty in that regard is hampering the development of 'clean coal' which is needed for the security of supply. For countries like the Netherlands and the UK with good coal harbours and old gas fields to store carbon, this should be a first priority.

I hope you enjoy this quarter's research, analysis and guest articles. Should you have any ideas or comments, please feel free to email apx@apxgroup.com ■

Best wishes

Bert den Ouden
CEO, APX

Firmer Price Expectations for Phase Two and Beyond

In terms of reducing CO₂ emissions, Phase One of EU ETS is seen as a failure but, according to Moffatt Associates' latest quarterly survey, market participants believe a viable trading mechanism has been established, lessons have been learned and prices in Phase Two could be firmer depending on plans for Phase Three.

Setting the scene

At the onset of Phase One, neither the EU Commission nor market participants had access to reliable emissions data. This lack of basic information and the tendency of some governments to be over-generous towards their own industries meant there was an over-supply of CO₂ allowances.

To begin with, the price of allowances in Phase One rose steadily to its peak level of about €30 per tonne in April 2006, but collapsed in May 2006 to under €10 per tonne, when more reliable data became available and on fears that some countries were likely to give their industries generous emission caps in Phase Two.

The Commission has acknowledged these failings and has been far stricter about the level of allowances granted to EU member states in the second phase. The caps have been tightened by about 7% and some countries, mainly in central and eastern Europe, are currently taking legal action against the Commission's allocation.

More significantly, the second phase of the ETS expands the scope of the scheme. All greenhouse gases, and not only CO₂, are now included, and external CDM (Clean Development Mechanism) and JI (Joint Implementation) credits can be introduced through the EU's 'Linking Directive'.

Aviation emissions are now expected to be included in the programme from 2012, a year later than had been proposed by

the Commission and European Parliament. This follows a decision by EU environment ministers at the end of last year to postpone implementation. As well as aviation, the plan is to include maritime emissions in the ETS at a later stage.

In a sign of the growing influence of the ETS, Iceland, Norway and Liechtenstein, all members of the European Economic Area but not of the EU, are expected to join the scheme in a move that the Commission says is the first international agreement of its kind. The EC will now examine the national allocation plans submitted by the three EEA members and the hope is that extending the ETS to other countries will help to strengthen the scheme.

Developments in 2007

Despite the collapse of the CO₂ price in 2006, traded volumes have continued to expand. The EU ETS has grown significantly over the course of 2007, with a traded volume of 1.6 Gt and a value of €28bn. This represents a growth on 2006 of over 50% in both volume and value terms. The volume distribution between brokers and exchanges throughout the year was stable at 70:30 in favour of brokers.

Activity within Kyoto's mechanisms – specifically the CDM – has also expanded in 2007. In total, the CDM market traded almost 1 Gt and €12bn in 2007. Growth in the secondary CER (certified emissions reductions) market has been spectacular with 77m CERs being issued in 2007. Given that CER prices are much higher ►

than in the primary market, the increased CER volume has significantly boosted the total value of the CDM market in 2007. There was also healthy growth in JI's.

Market balance in Phase Two

Phase Two requires the EU to reduce emissions by 1.5bn tonnes and it is expected that roughly 1.3bn tonnes of this will come from imported CDM credits (see above). The market expects that fuel switching inside the EU will provide the remaining reductions to meet the cap. As a result, CO₂ prices are being driven by variations in coal and gas prices, and prices for coal, gas, electricity and carbon continue to chase each other.

Despite tighter emissions caps within the EU, there is a risk that CO₂ prices in Phase Two could be lower than expected. This is because of generous CDM import allowances and the possibility that the demand for EUAs could weaken as a result of (a) weather conditions reducing power generation, (b) increase in renewable generation and/or (c) increase in energy efficiency.

In our recent survey, market participants were unanimous in their view that CO₂ prices will be firmer in Phase Two but there were mixed views on whether CDM would weaken the market (**See Table of Questions and Responses below**).

There was widespread support for the statement that CO₂ allowances should

not be allocated freely and should carry a cost or be auctioned. In addition, according to respondents, the average price deemed necessary to trigger a significant reduction in CO₂ emissions was 35 euros per tonne.

Looking beyond 2012

Attention has now turned to what will happen in the third phase of ETS post 2012. The Commission has been conducting a review of the ETS, with input from market participants and other interested parties, and on 23 January 2008 it published the results of this review as part of an energy and climate package, which contained a range of draft legislative proposals.

The measures are designed to cut CO₂ emissions by 20% by 2020 compared to 1990 levels. The commitment would rise to a 30% reduction, if other industrialised countries agree to make comparable efforts as part of a global agreement to combat climate change, post 2012. The aim is for trading sectors in Phase Three to be required to reduce emissions by 21% by 2020, compared to 2005 levels.

As had been widely expected, national governments will lose their role in setting overall caps for carbon emissions after 2012. Instead, the Commission will set one EU-wide cap on the number of emission allowances, instead of 27 national caps. This should even out the allocations and avoid the risk of

Survey Questions and Responses

	Agree	Disagree	Don't Know/ No Comment
CO ₂ prices will be firmer under Phase II than Phase I	100%	0%	0%
The price of allowances in Phase II will be too low to stimulate investment in low carbon technologies	17%	73%	10%
Offset credits (i.e. Certified Emissions Reductions from CDM projects outside the EU) will weaken the market	47%	43%	10%
CO ₂ allowances should not be allocated freely but should carry a cost or be auctioned	77%	7%	17%
Phase II of ETS will be tougher and could lead to a price of at least €40 per tonne	55%	31%	14%

those companies operating in countries with stricter governments being at a disadvantage.

In Phase Three, which will run from 2013 to 2020, emissions allowances to heavy emitting industries covered under the EU ETS will be reduced each year so that the target of a 21% reduction compared to 2005 levels can be achieved by the end of the period. That would mean 1.72bn tonnes of CO₂ equivalent emissions compared with just over 2 bn tonnes now, allowing for new entrants.

Another major change from the present arrangements is that a much larger share of allowances will be auctioned rather than being allocated free of charge. It is estimated that around 60% of the total number of allowances will be auctioned in 2013, and this proportion will increase in later years.

Other modifications include the redistribution of part of the rights to auction allowances from member states with high per capita income to those with low per capita income, largely countries in eastern Europe. The aim of this particular amendment is to enable the latter to invest in environmentally-friendly technologies.

A number of new industries, including aluminium and ammonia producers, will also be incorporated into the ETS post 2012, as well as two further gases, nitrous oxide and perfluorocarbons. In addition, member states will be allowed to exclude small installations from the scope of the system, provided there are measures to achieve an equivalent contribution to emission reductions.

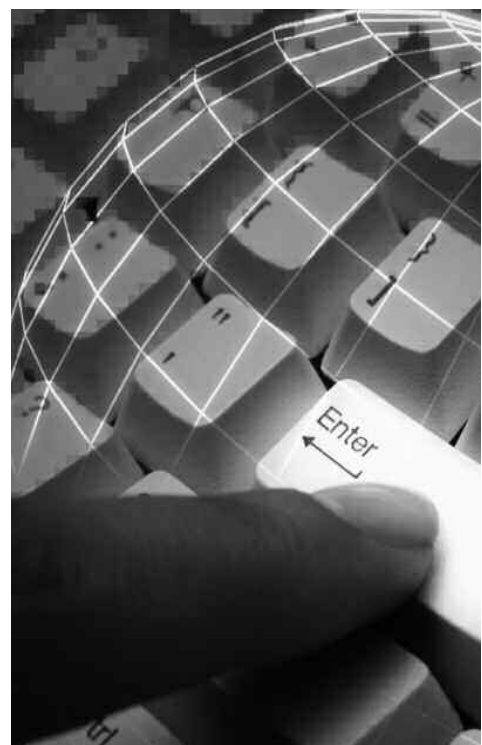
Price impact of Phase Three

The EU Commission's ambitious targets of a 20% reduction in GHG, 20% renewable energy production and 20% improvement in energy efficiency, all by 2020 will, if achieved, have a significant impact on the carbon market in Phase Three and beyond.

A key component of Phase Three is the EC proposal not to allow for any further CDM import credits for at least as long as there is no new international climate change agreement. Curtailing imports and/or allowing Phase Two credits to be carried over into Phase Three could mean more CO₂ reductions in Europe and also higher EU carbon prices.

The Commission is desperate to avoid a situation where a low CO₂ price undermines investment in low carbon technologies. The hope is that the centralisation of cap-setting, a reduction in the volume of imported credits available for compliance and the large auctioning of allocations, will set the stage for a more competitive environment, where the price of carbon will be set by the actual costs of reducing emissions through investments in the EU, rather than reliance on the CDM market for most of the abatement. ■

Moffatt Associates
February 2008



What Lies Ahead for the Carbon Market

According to Henrik Hasselknippe and Endre Tvinnereim of Point Carbon, what the European Commission decides for Phase Three of the EU ETS (2013-2020) will have important implications for the CO₂ price in Phase Two.

The carbon market in 2007

In 2007, the carbon market matured. It was also the year when climate change was placed at the top of the global political agenda. Following the Stern report, which laid the foundations of the economics of climate change in late 2006, the issue seized even more attention with the IPCC's fourth assessment report (4AR). The report stated that climate change was "unequivocal" and made it extremely difficult for anyone to remain a sceptic about global warming.

In the wider carbon market, total traded volume grew from 1.6 Gt in 2006 to 2.7 Gt in 2007 – an increase of 64 per cent. The value of the carbon traded grew even more, by 80 per cent, to €40bn (\$60bn), in the same period and the growth of the secondary CER (certified emissions reductions) market has been spectacular. Another feature of 2007, was the advent of options trading in EUAs and CERs, although volumes are still very small.

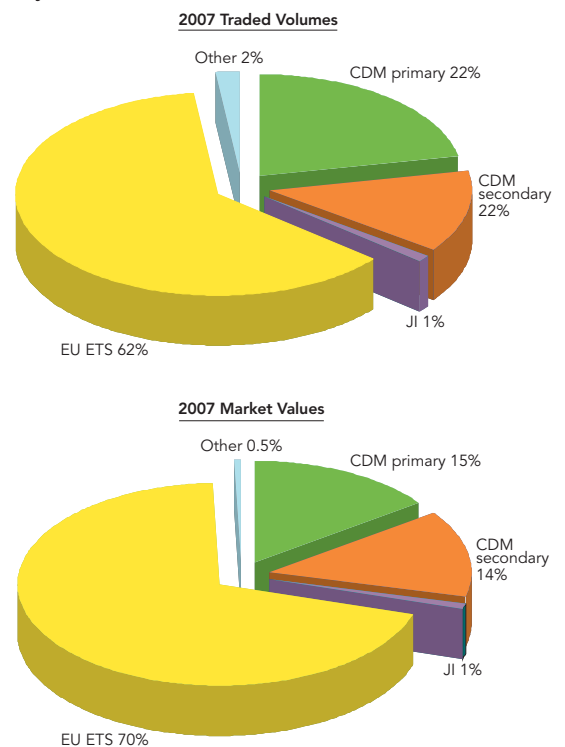
The EU ETS has grown healthily over the course of 2007, with a traded volume of 1.6 Gt and a value of €28bn. This represents a growth on 2006 of over 50% in both volume and value. The distribution between brokers and exchanges was stable at 70:30 in volume terms throughout the year.

Activity within Kyoto's mechanisms – specifically the CDM – grew rapidly in 2007. In total, the CDM market traded almost 1 Gt and €12bn in 2007. Given that CER prices are much higher than in the primary market, the increased CER

volume has significantly boosted the total value of the CDM market in 2007. There was also healthy growth in JI's.

Some of the increased activity in the CDM market is due to a tripling of issuance rates compared to 2006, with 77m CERs having been issued in 2007. Although 2007 saw a significant increase in inflow of new CDM projects, especially within renewables, there is still a squeeze in terms of expected issuance for the first two years of the Kyoto commitment period (2008-09).

Figure 1: Volumes and Values Dominated by the EU ETS



Outlook for Phase Two

The European Commission came in for considerable criticism following the collapse of carbon prices in Phase One. ►

While the overall allocation in 2005 to 2007 was primarily a result of poor historical data used as a basis for NAPs, much of the blame was directed towards the EC. During 2007, the Commission showed determination in cutting allocations and credit limits for Phase Two NAPs as well as pushing for the inclusion of aviation in the trading scheme.

It is now evident that the EU ETS has entered Phase Two with a considerable initial shortfall, and that the system will lead to actual CO₂ reductions. The overriding question is whether these reductions will take place within Europe or if the import of CDM (and JI) credits is flexible enough to ensure that all reductions will happen abroad. At the outset, looking at the rules for Phase Two, it seems that the EC had been very generous in the level of import for European installations, and that the EU ETS could, at least in theory, meet its entire demand through investing in developing countries.

On 23 January 2008, the Commission published its Climate and Energy package, consisting of a suite of policy proposals intended to meet the combined targets of 20% greenhouse gas reductions, 20% renewable energy production, and 20% improvement in energy efficiency, all by 2020. Part of this package was a proposal for a revised emissions trading scheme, to start in 2013. One central element of this review, which has taken the carbon market by some surprise, is the proposal to not allow for any further import of credits from abroad, for least as long as there is no further international agreement.

In principle, what the EC has now proposed for Phase Three (running from 2013 to 2020), will have direct implications for the current trading period. With no further imports than the 1400 Mt of reductions that are allowed for in Phase Two or the possibility to bank these

credits into the next phase, the EC has ensured that more emission reductions will take place within Europe. Whereas the import limit was previously 280 Mt (or 1400 Mt over 5 years), it is now about 108 Mt (same volume, but over 13 years). This reduced import ability could certainly lead to larger scale emission reductions within Europe, and also higher carbon prices.

It remains to be seen whether the current proposal will survive the gruelling co-decision procedure in Brussels. As we see it, this proposal has a high level of political support, and could be approved quicker, and with fewer changes, than many anticipate. If so, we might soon see a firmer price regime for European carbon. ■



Risk of Low Carbon Price

According to Hugo Robinson of Open Europe,¹ linking Phase Two of ETS with Kyoto credits generated outside the EU, imports a level of price uncertainty that will be detrimental to the future low carbon investment in Europe.

Setting the scene

The first phase of the EU Emissions Trading Scheme has been widely judged a failure. More permits to pollute were printed than there was pollution and when the market discovered this, prices collapsed dramatically. The EU Commission has acknowledged these failings, but now takes the line that the first phase of the ETS was always going to be a 'learning by doing' phase.

Likely market balance in Phase Two

Unfortunately, the risks of low carbon prices are still very much present in Phase Two.

On the face of it, the National Allocation Plans (NAPs) for Phase Two look to have set a cap on carbon emissions tight enough to guarantee the scarcity in permits necessary for a firm carbon price. Over the five year trading period, the total cap for the EU-25² is about 1.3bn tonnes of CO₂ below projected emissions.

However, in the second phase of the ETS member states will be able to "import" external Kyoto "credits" from developing countries in order to meet their targets. These are generated from Clean Development Mechanism (CDM) and Joint Implementation (JI) projects designed to reduce emissions. There is in theory a limit on how many of these credits can be imported – but in practice this limit has been set so high that it is virtually meaningless – in fact, the limit is almost equivalent to the expected emissions shortfall.

Therefore, the potential supply of Kyoto credits will be a decisive driver of ETS prices for Phase Two. The key question is how many will be available in the market?

After surveying carbon market participants last year, the World Bank said that between 1bn and 1.2bn tonnes worth of credits would be available between 2008 and 2012, with the effect that "installations, using credits from CDM and JI, could be in a balanced position or a marginally short one."³ In a more recent analysis, Point Carbon predicted that all of the scarcity created in Phase Two could well be covered through imported credits, with total supply reaching 1.3bn.⁴

With a current pipeline of projects likely to yield a total of around 2bn tonnes worth of credits, much will depend on the demand from other major buyers of Kyoto credits: EU governments and Japan. EU government demand will account for about 400-500Mt, whilst Japanese demand will be around 700-800Mt – although this will depend on a variety of factors, including the effectiveness of other climate change policies adopted. However, in order to meet their obligations under the Kyoto protocol, Japan, Italy and other European countries have expressed interest in importing another form of credits from Russia and former Soviet bloc countries – Assigned Amount Units (AAUs). Under Kyoto, targets to cut emissions were set relative to 1990 levels but eastern

¹ Open Europe is an independent non-party political think tank based in London.

² Since reliable emissions data for Romania and Bulgaria is not currently available, these have not been included in our estimates – whilst these countries will exercise some influence on the overall balance of the ETS, it is not likely to radically alter our assumptions.

³ World Bank, *State and trends of the carbon market 2007*.

⁴ Roine, K. "CDM/JI supply: Will there be enough?," *Carbon Market Europe*, Point Carbon (1 June 2007)

European countries, including Russia, lost large amounts of industry following the collapse of the Soviet Union, so their emissions today are much lower than in 1990. This means they have large numbers of AAUs for sale. Taking into account the dilution in EU and Japanese government demand likely to result from this supply of AAUs, it is probable that analysts are correct in predicting that the ETS shortfall will be more or less covered through imported credits.

Indeed, the supply of AAUs (which has become known, rather notoriously, as ‘Russian hot air’) could prove to be a significant, and possibly negative, factor affecting emerging global carbon markets – to which the EU ETS is linked.

A recent study by the Japanese Ministry of Economy, Trade and Industry estimated that a potential supply of 8.3bn tonnes of AAUs would lead to an oversupply and price collapse in the Kyoto carbon markets. Prof. Catrinus Jepma of Amsterdam University, whilst estimating an influx of ‘only’ 2.7bn tonnes of Assigned Amount Units (AAUs), also concluded that the Kyoto carbon markets would be “characterised by a structural

over supply of credits.” (See Figure 1 below) Such a scenario would feed through into far lower prices in the linked ETS.

Figure 1 – Kyoto Credit Supply and Demand (Jepma 2007)

Projected supply	5.75bn
CDM	2.90bn
Jl	0.15bn
AAUs (restricted sale)	2.70bn
Projected demand	3.50bn
Net surplus of credits	2.25bn

It is unlikely, however, that the former Soviet states will simply flood the market with all their excess AAUs. Moreover, many Western governments refuse to buy credits that simply mean filling the coffers of the Kremlin. In order to circumvent this issue, it is likely that many AAUs will be purchased on the condition that proceeds are earmarked for investment designed to curb emissions – through the Green Investment Scheme (GIS).

Both Russia and Ukraine are actively pursuing the GIS option, together with ‘fast-track’ Jl projects that generate credits through modest (and therefore ►



low cost) upgrades to ageing, inefficient industrial plants, with the potential to generate large volumes of cheap credits. A great deal may depend on the extent to which Russia can persuade Ukraine and other smaller 'hot air' countries to fall into line in imposing cartel-like control on carbon supply, effectively organising a 'carbon OPEC'. If the Kremlin is unable to do this, the scenario of hot air oversupply, and very low ETS causing prices, becomes more likely.

Negotiations on the post-Kyoto framework will also be pivotal. If credits from the current phase can be used beyond 2013, this will encourage a rapid expansion in projects, and the numbers of credits available for use in Phase Two of the ETS. The post-2013 framework could also determine whether countries with AAUs choose to bank these credits for sale after the current Kyoto commitment period (2008-2013).

The overarching conclusion for the supply/demand balance of the ETS in Phase Two is one of very high uncertainty, created by a range of geopolitical and economic variables. Such uncertainty, in no small measure heightened by linking the ETS with the Kyoto markets, is clearly undesirable from a market perspective. This can only act as a deterrent to the kind of long term structural investment in a low carbon economy that a serious climate change policy ought to deliver.

How will the ETS interact with the EU's other energy policies?

The EU has recently announced massive new targets for mandatory renewable energy use by 2020 – 20% of total EU energy consumption by 2020. However, since electricity constitutes only a part of overall energy use and is a cheaper sector in which to realise expansion of renewables than transport or heating, the EU target will mean around 34% of

electricity having to be generated from renewables.

Such a large level of renewable incorporation in the power generation sector could have a major impact on carbon prices. In order to meet the EU targets, it is almost certain that large amounts of subsidy will continue to be required to spur investment in this form of generation. However, since this would reduce scarcity of carbon within the sectors subject to emissions trading, the price of carbon would also fall within the ETS.

Put simply, the EU ETS and renewables targets are mutually contradictory, and risk creating a 'waterbed' effect – reducing emissions in some areas, but leading to increases in other areas. UK officials, in leaked papers, issued a stark warning to the Government: "If the EU has a 20% GHG (greenhouse gas) target for 2020, the GHG emissions savings achieved through the renewables risk making the EU ETS redundant, and prices to collapse."

The influence of massive subsidy for electricity generation will be most noticeable in Phase Three of the ETS (2013 – 2020), but will undoubtedly be a factor in the later stages of Phase Two, adding further to the uncertainty described above. ▶



Will the ETS deliver for the environment?

As stated above, it is more than likely that the shortfall of allowances in Phase Two of the ETS will be covered by imported credits.

This might be acceptable if these credits reflected real emissions cuts – unfortunately, they have already been exposed as highly flawed, and often fraudulent. Projects which trap and destroy HFC-23, a potent greenhouse gas, are the best known example of these problems, with an accounting loophole being used to generate fat profits and massive economic distortions. Up to €5bn has been wasted on projects that should have cost no more than €100m.

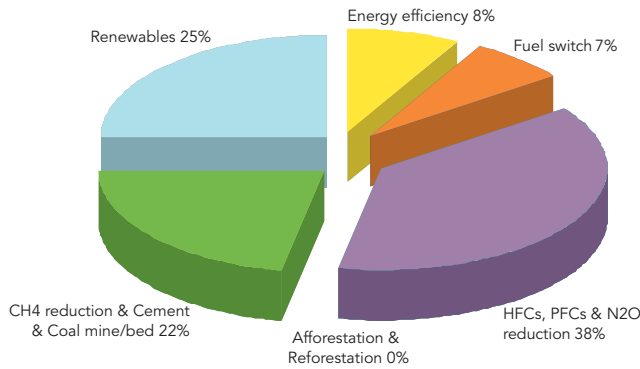
Kyoto projects do not always reflect absolute reductions in emissions, whilst many of these credits are generated

from projects in developing countries that would have happened anyway. **(See Figure 2 below)** Issuance of such credits equates to a subsidy for increased pollution.

Furthermore, the promised development gains of the Kyoto mechanisms remain dubious. As **Figure 3 below** shows, most investment in these projects will be directed to China and India. Most of this will be absorbed for by large, highly capitalized firms (often those involved in HFC destruction). Sub-Saharan Africa will see a negligible share of investment.

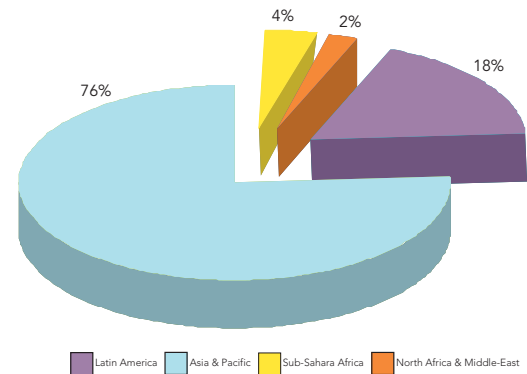
In conclusion, linking the ETS with the Kyoto markets seriously undermines the environmental integrity of the EU ETS, whilst importing a level of price uncertainty that will be detrimental to future low-carbon investment in Europe. ■

Figure 2 – Estimates 2012 Certified Emission Reductions (CERs)



Source: UNEP Risoe Centre (<http://cd4cdm.org/>)

Figure 3 – Distribution of CERs in the Pipeline



Source: UNEP Risoe Centre (<http://cd4cdm.org/>)

Will We Learn From Experience?

Between 2008-12 the market seems to be expecting a price of carbon in the €20/€30 per tonne range. According to Dr Anthony White and Coralie Laurencin of Climate Change Capital, it could be lower but there are reasons for expecting that in Phase Three prices will be higher than Phase Two.

Setting the scene

The ETS is the EU's main instrument for reducing emissions in the EU by 20% in 2020. Phase One of trading was unsuccessful, because neither its creators, nor its participants, had access to accurate emissions data at the outset. As a consequence, the market did not fully understand the supply and demand fundamentals and the price of CO₂ crashed half-way through the period, when reliable data became available.

Phase Two of trading is able to build on the data from Phase One, so the market expects a credible price will emerge and lead to actual emissions reductions in the EU. For some time now, the market has been confident that it understands the price drivers for 2008-2012 and the price is widely expected to be in the €20 to €30/t range.

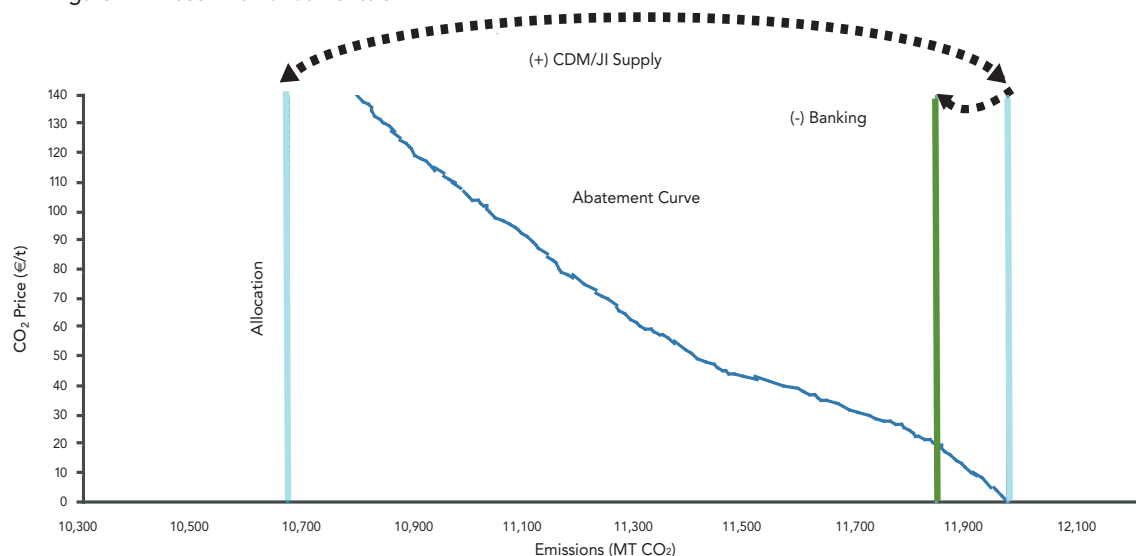
Traders expect fuel switching between gas and coal at power stations to deliver the marginal abatement opportunities.

Therefore, CO₂ price forecasts are being driven by expectations of coal and gas prices. But with the experience of Phase One there remain, however, numerous uncertainties surrounding the supply and demand fundamentals and this could lead to significant price volatility.

Focus on fuel switching

Phase Two requires the EU to reduce emissions by 1.5bn tonnes and it is expected that roughly 1.3bn tonnes of this will come from imported credits; i.e. CDM projects delivering emission reductions outside the EU that can be used to comply with emissions targets in the EU. This is shown in **Figure 1 below**. The market expects that fuel switching inside the EU will provide the remaining reductions to meet the cap. As a result, CO₂ prices are being driven by variations in coal and gas prices. The market seems content with this equation and the prices of coal, gas, electricity and carbon continue to chase each other. ▶

Figure 1 – Phase Two Fundamentals



Source: Climate Change Capital

Could the price be lower than expected?

One of the risks in Phase Two price is that, again, the supply and demand fundamentals could be misunderstood or evolve in such a way that the market will be forced to reassess its assumptions leading to price volatility. Because data on the level of demand is only published once a year, any deviation from the expected emissions could lead to a brutal adjustment, as was the case in April and May 2006. Both supply and demand factors could impact on the level of demand in the ETS market:

- ◆ The level of demand depends on the climatic conditions which drive electricity demand. A series of warm winters and cool summers and/or higher than average hydro availability would reduce emissions from electricity production and in turn reduce the need for abatement in the electricity sector. We anticipate that extreme weather conditions can increase or reduce emissions by up to 100 million tons per year causing the price of carbon in Phase Two to increase or drop by approximately €10/t.

- ◆ Another risk to the CO₂ price could come from changes in the electricity supply mix. An increase of capacity of renewables or a cancellation of decisions taken to phase-out nuclear will reduce the emissions coming from the electricity

sector. In particular, on January 23rd the EU Commission published a draft Directive to develop renewables capacity so that 20% of all energy needs can be met by renewables in 2020. This effectively requires renewable sources to provide around 35% of power in the EU, which, if achieved, would significantly reduce emissions at the end of Phase Three.

- ◆ In addition, in March 2007, the Council of Ministers agreed to take steps to improve Europe's energy efficiency by 20% by 2020. Member States are already developing policies to implement these targets and this could lead to emissions reductions in the electricity and heating sectors, both of which are covered by the ETS and could impact on emissions before 2012.

The possibility of a lower internal abatement requirement places the market at risk of a price drop from current level above €20/t to levels below €15/t. This, perversely, would be counter-productive because the confidence in the market would be affected and investors would be making investment decisions based on a lower carbon price. In this case, the ETS, which is designed first and foremost to provide the incentives to allow industry and energy companies to invest in lower carbon intensive capacity, would not deliver its objective. ►



Learning by doing

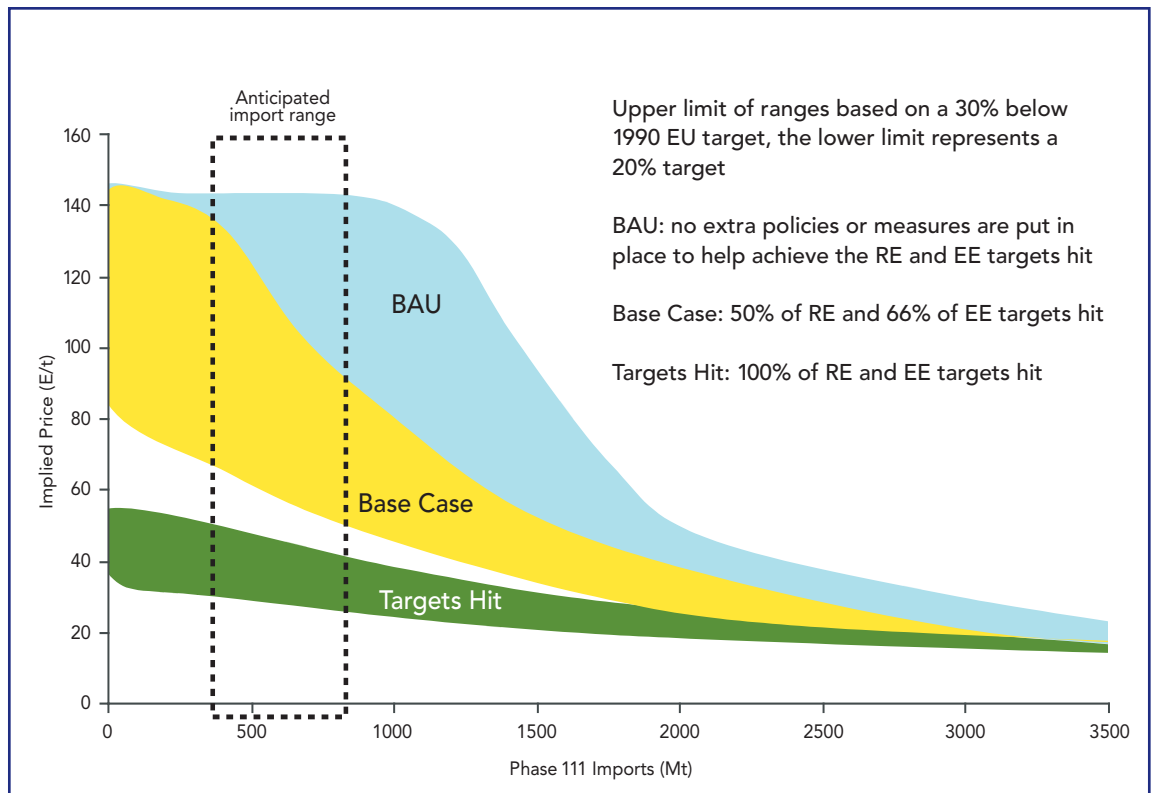
The architecture of Phase Three is designed to mitigate these risks and to lead to effective investments in low-carbon technologies across Europe. The centralisation of cap-setting, the reduction of the volume of imported credits available for compliance and the large auctioning of allocations, will set the stage for a more competitive environment, where the price of carbon will be set by the actual costs of reducing emissions through investments in the EU, rather than reliance on the CDM market for the bulk of the abatement.

Figure 2 below shows our expectation of possible price ranges depending whether, or not, the EU is successful in meeting the combined targets of a 20%

reduction in overall emissions, 20% contribution from renewables and a 20% improvement in energy efficiency. It shows that we expect that the carbon price in Phase Three will be higher than the price in Phase Two.

Owing to the possibility of using Phase Two allowances to meet obligations in Phase Three, we expect that, at some time during Phase Two, prices for allowances will move in line with Phase Three prices, discounted by the time value of money. Investors will be hoping that, as the EU discusses the third phase of trading during 2008, policy makers will have learned their lesson and the ensuing price of CO₂ will indeed provide a clear signal for investment in low-carbon technologies. ■

Figure 2 – Phase Three Supplimentarity and Policy Scenarios



Source: Climate Change Capital

European Energy Market Trends Survey – Winter 2007/08

This edition of **Energy Viewpoints** includes the results of our latest quarterly survey which monitors trends in the European energy markets.

This survey is run in association with **EFET** (the European Federation of Energy Traders) and is conducted by **Moffatt Associates**, an independent market research and business strategy consultancy based in London.

The objectives of this research programme are to canvas views on trends in market prices and energy market developments and to monitor changes in market perceptions over time.

Results are based on the views of a representative panel of leading market participants and policy influencers. The survey itself takes the form of a detailed telephone questionnaire and is conducted on a strictly confidential and non-attributable basis. Respondents were interviewed in January 2008.

This quarter we received contributions from 31 senior market participants from

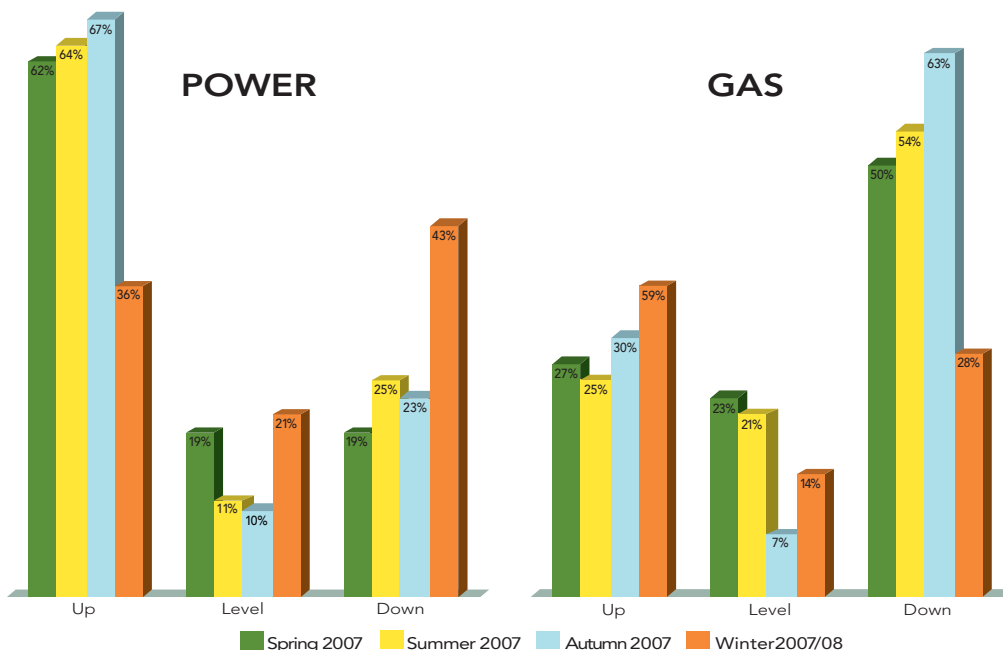
10 European countries (Austria, Belgium, Germany, the Netherlands, Norway, Poland, Spain, Sweden, Switzerland and the UK).

The key findings are as follows:

Market Trends

- Both for **power prices** and **gas prices**, the prevailing view is that prices will experience a downward trend over the next twelve months. This was especially true for gas, where twice as many respondents (48% compared to 24%) expected lower prices than higher prices. For power, 43% predicted that forward power prices would be lower in a year's time, with 36% saying they would be higher.
- In a significant shift away from the last three surveys, now just 36% of respondents believe that European **spot power prices** will increase over the next twelve months – down from ▶

What will be the underlying trend for spot energy prices across Europe in the coming 12 months?



67% last quarter. The most popular view is that prices will fall this year, held by 43% of Panel members, with the remaining 21% expecting stable prices.

- In a parallel shift in the gas market, there has been a sharp rise in the number of respondents expecting European **spot gas prices** to fall over the next twelve months – 59% said this would be the case, compared to just 30% last quarter. Now, just 28% expect prices to rise and 14% say they will remain level.
- Future **power prices** in our four featured markets generated mixed responses, with no overall sentiment prevailing. Whilst the most popular view regarding **Scandinavian** power prices over the next 12 months was that they would remain broadly unchanged (so said 30% of respondents), future power prices in **Germany** may be expected to increase by less than 3% (so said 26%). In **the UK**, prices may increase by more than 3% (so said 30%) and in **the Netherlands** they may decrease by more than 3% (so said 35% of respondents). Each of the four regions saw a considerable variety of opinion.
- Future **gas prices** also generated a wide range of opinion. The most widely supported view, however, was that these would fall over the next 12 months. For **Germany**, the most

popular view was that prices would fall by more than 3% (so said 35% of respondents) and a similar opinion was held for prices in **the UK** (32% of respondents). This view was also true for **the Netherlands**, for which 46% expect sharp price falls. The only exception was **Scandinavia**, where future gas prices are expected to remain unchanged (so said 33%).

Key Factors Influencing Energy Prices

For the following five issues our Panel of experts was asked whether there would be an upward, downward or stable impact on energy prices in the next 12 months. Panel members were also asked to rate, on a scale of 1-5, how **significant issues** would be in **determining energy prices** over the next five years. In a notable development, the most significant factor is now seen to be environmental pressures, although there has been relatively little change in factors' significance over the last year. This quarter, our Panel was divided on whether movements in fossil fuel prices are having an upwards or downwards effect on energy prices.

- Panel members were asked to identify the most significant **issues** facing energy markets in the next 6-12 months. The most frequent responses were the Third Package of measures on energy market liberalisation, and reaction to the EU's documents on the

	Winter 2007/2008		Winter 2006/2007	
	Direction	Significance	Direction	Significance
Environmental pressures	Upwards	4.1	Upwards	3.8
Movements in fossil fuel prices	Upwards /Downwards	3.8	Stable	4.0
Infrastructure developments	Downwards	2.4	Downwards	2.4
Market liberalisation	Downwards	2.0	Stable	2.4
Industry consolidation	Upwards	2.0	Stable	2.0

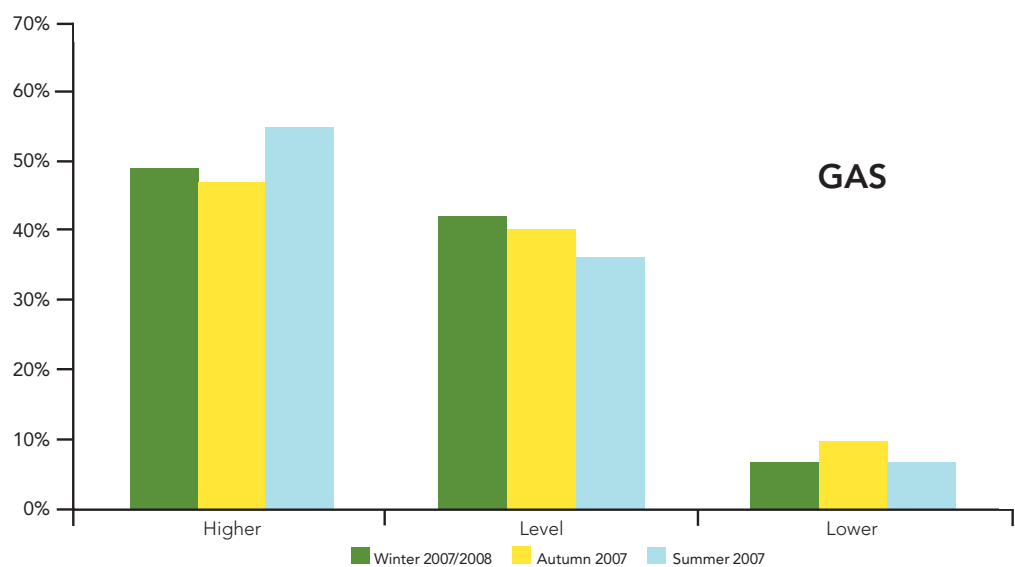
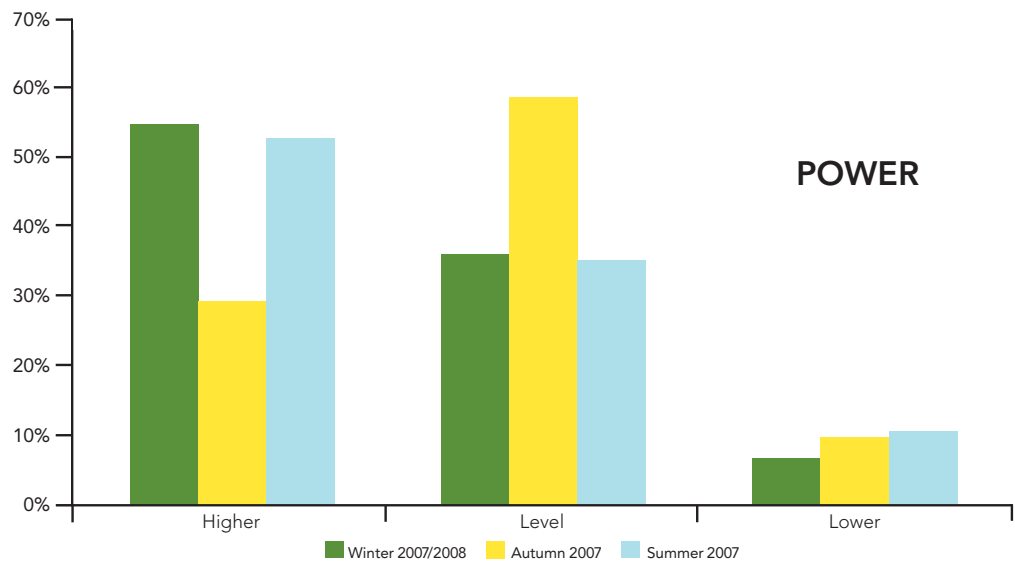
future of the ETS. Mention was also made of ownership unbundling, the finalisation of NAPs, regional integration and increased use of nuclear plant.

- Respondents whose companies have some cleared traded volumes said that, on average, 34% of their trading was **cleared** (down significantly from 47% in the previous quarter).
- EU energy market trading activity (defined as volumes traded – exchanges

and OTC) will increase over the coming 6 months, according to a majority of respondents. For power, 59% said activity would increase; for gas, the figure was 68%.

- Regarding the proportion of market activity going through exchanges during the next 6 months, 56% of respondents expect this to increase for power (up from 30%). For gas, the figure is 50% (up from 48%).

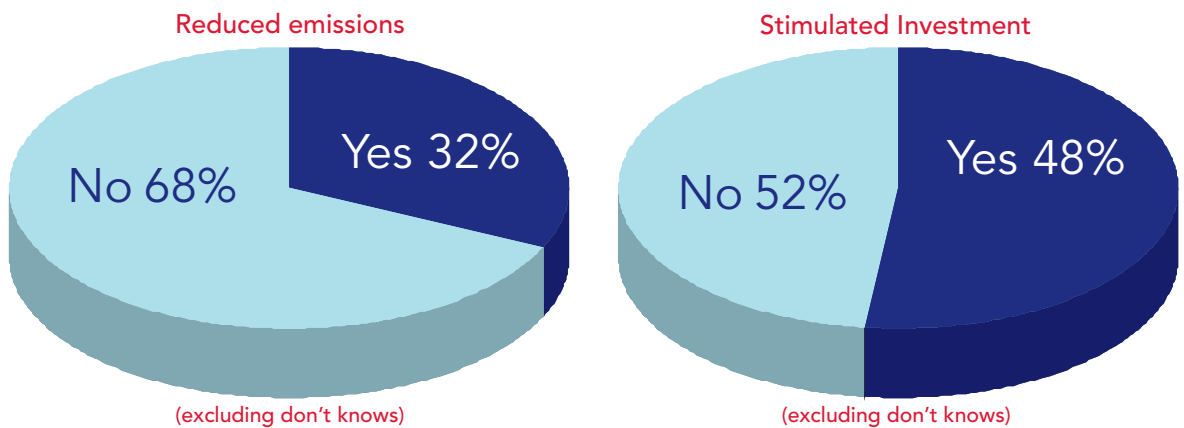
What will be the underlying trend for spot energy prices across Europe in the coming 12 months?



Special Topic: Carbon Emissions Trading

On 1 January 2008, Phase Two of the EU Emissions Trading Scheme (ETS) commenced, covering the period 2008-2012. For this quarter's special topic, participants were invited to evaluate Phase One and consider the implications of the second phase.

Has Phase One of ETS been a success in terms of (a) reducing CO₂ emissions, and (b) stimulating new investment in low carbon technologies? If Yes, why? If Not, why not?



Selected comments

"(a) No, and (b) No. Just look at the market price evolution during Phase I. But it did create awareness that something needs to be done about CO₂ emissions and green energy investments."

"Only partly, but it has trailed Phase II and Phase III which will have an impact."

"(a) No, and (b) yes, but still limited. This is because it is still of a subsidy nature and

has not moved to a real enduring market."

"(a) Yes, although the ETS itself was over-allocated, the introduction of a price on carbon has led to considerable investments in CDM and JI projects, clearly reducing CO₂ emissions, (b) Yes, despite over-allocation in Phase I, the expectation of increased constraints in the future has resulted in companies taking the price of carbon into account in their investment decisions." ▶



Did Phase One establish a viable market mechanism for operating a cap and trade system?

Yes	No	Don't Know
71%	16%	13%

Selected comments

"Yes, as it showed that such a mechanism can work across countries and market participants."

"Yes, Phase One should be seen as a learning period, using the experience to properly design the ETS to come."

"No, because of length in the market."

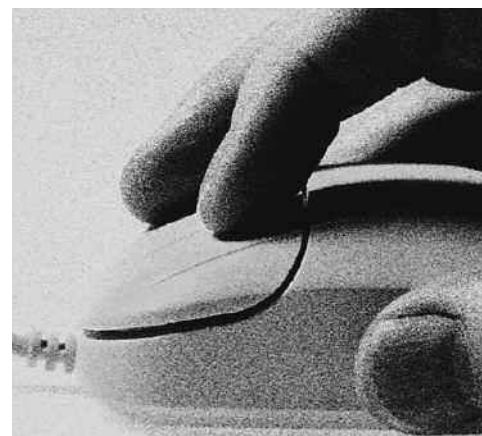
"More or less, yes. However, some very important problems remain, namely the interference of politicians, trying to claw back windfall profits."

"Yes, the mechanism itself was working, but the allocation of EUAs was not properly done."

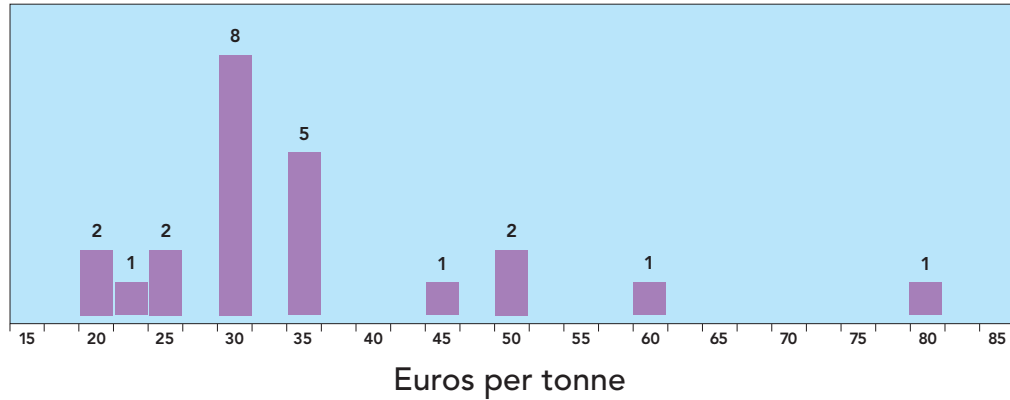
"Yes, the market is operational, exchanges, brokers and contract structures are in place, there is a price on carbon." ▶

Survey participants were invited to agree or disagree with the following statements:

	Agree	Disagree	Don't Know/ No Comment
CO ₂ prices will be firmer under Phase II than Phase I	100%	0%	0%
Governments will be under pressure to over-supply the market with CO ₂ allowances	33%	53%	13%
The price of allowances in Phase II will be too low to stimulate investment in low carbon technologies	17%	73%	10%
Offset credits (i.e. Certified Emissions Reductions from CDM projects outside the EU) will weaken the market	47%	43%	10%
CO ₂ allowances should not be allocated freely but should carry a cost or be auctioned	77%	7%	17%
Phase II of ETS will be tougher and could lead to a price of at least €40 per tonne	55%	31%	14%
Phase II will not work because long-term planning is essential and nobody knows what's going to happen after 2012	23%	63%	13%



What CO₂ price is necessary to trigger a significant reduction in CO₂ emissions?



Note: where respondents gave a price range, the midpoint was used.

- The average price deemed necessary to trigger a significant reduction in CO₂ emissions was 35 euros per tonne. Because this figure was distorted by two high responses, the more relevant figure is the median response of 30 euros. Only 4 respondents thought the price would need to be as high as 50 euros.

In addition to the ETS, do we also need direct measures such as renewable subsidies and carbon taxes to reduce CO₂ emissions?

Yes	No	Don't Know
48%	42%	10%

Selected comments

"Yes to subsidies to stimulate domestic growth in the 'right' technologies but no to CO₂ taxes."

"No – absolutely not! Renewable subsidies are ideologically driven market distortions that render the price of energy, and of carbon emission reductions, needlessly expensive."

"Yes, for the time being the EU ETS will not be able to deliver the ambitious reduction targets on its own. Even within the power generation sector, the ETS will have to be accompanied by other incentive schemes for years to come."

"No, I don't think they are needed if the mechanism works and the allocation is properly arranged."

"The current mess of subsidies should be simplified and should evolve into a cap and trade mechanism for CO₂ emissions and a market-based, guarantee of origin scheme for renewables."

"Yes, because I think the ETS alone is not long-term enough to get investment." ►



How should climate change be managed after the Kyoto Agreement expires in 2012?

Respondents were keen to stress the importance of a truly global agreement, incorporating the USA, China and India. This new agreement could be an extension of Kyoto, the unification of the EU ETS and other regional arrangements, or a new initiative led by the UN. The cap and trade system remains generally popular.

Selected comments

“Cap and Trade should continue, combined with taxation and efficiency measures.”

“Ideally it would have to sign up everyone rather than a limited number of countries. Everyone needs to be signed up for the scheme to be a success.”

“Have a similar system with auctioning of quotas and allocate cash to stimulate renewables.”

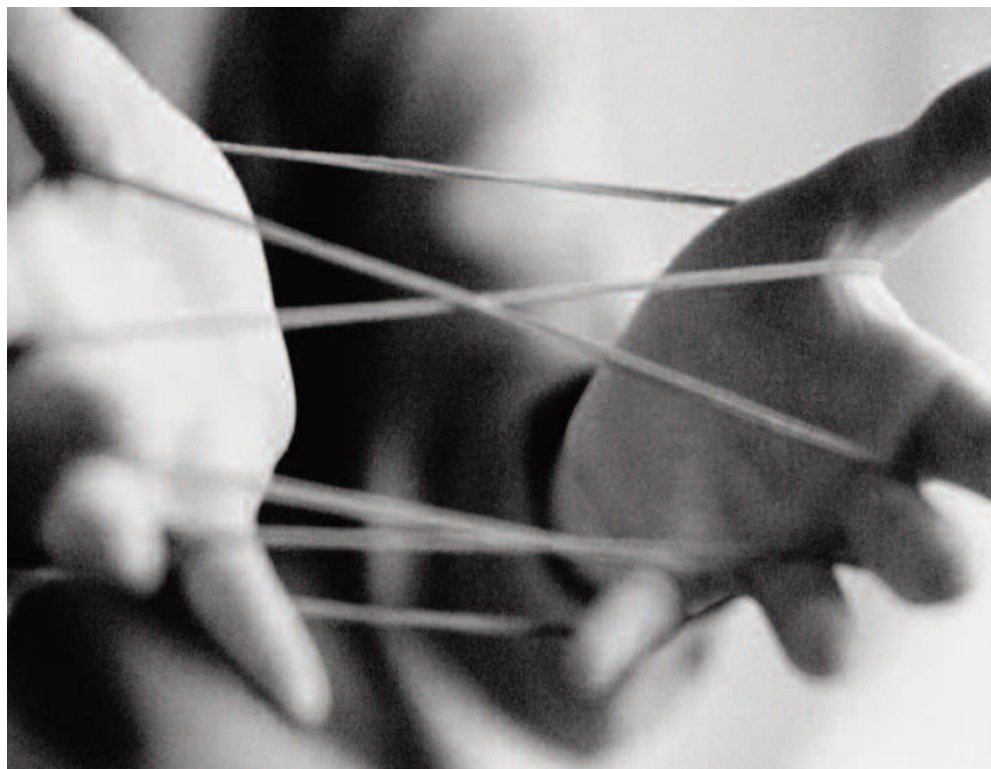
“Some sort of international (UN) global scheme would be ideal or, failing that, at EU-wide level, but there is no point in the EU reducing carbon if the Chinese open a new power plant every two weeks. It must be global and must be signed by the Americans, the Chinese and the Indians.”

“Through a new agreement building on Kyoto, with emissions trading at its heart, with deeper targets for industrialised countries, and new commitments for developing countries.”

“With a further phase (of Kyoto) and increased regional agreements.” ■

Moffatt Associates

February 2008



APX Group News

Annual Results Summary

The APX Group saw a marked improvement during 2007 in the electricity and gas markets in the Netherlands, Belgium and United Kingdom.

On the Dutch electricity spot market, volumes increased by 8% to above 20.9 TWh in 2007 compared to 19.3 TWh in 2006. The average daily day-ahead volume in 2007 was 56,677 MWh (Megawatt-hours), which is approximately 19% of the average Dutch energy consumption. This growth was concentrated in the second half of the year, when daily record volumes broke through the 85,000 MWh barrier, representing approximately 28% of the average Dutch energy consumption. Due to growing volumes during 2007 and an anticipated continued growth in 2008, APX Power NL has lowered its regular fees for the Dutch electricity spot market by 25%.

APX UK Power volumes grew by 6% to above 10.55 TWh in 2007 compared to 9.95 TWh in 2006. The average daily volume in 2007 was 28,901 MWh. Similar to the Dutch market; growth was also concentrated in the second half of the year.

APX Gas UK had a stable number of trades, lower volumes (12%) but had an increase in members as well as several improvements regarding the trading systems.

On the TTF, the Dutch virtual trading point, the yearly volume more than doubled to 596 GWh (2006: 218 GWh).

On the Belgian Zeebrugge hub, the increase was even stronger, with the 2007 volume rising to 341 GWh (2006: 20.6 GWh). This was due to several measures by the exchange, such as the reduction of exchange fees, and increased activity from major participants on the gas market. Despite these positive developments the continental gas markets are still a long

way from maturity, and more measures are needed in order to approach the same situation as experienced in the electricity markets.

Market Coupling

In November 2007, the first annual results for Trilateral Market Coupling (TLC) of the French, Belgian, and Dutch day-ahead electricity markets were revealed.

The results showed that the electricity prices on the Powernext, Belpex and Dutch APX day-ahead markets were identical in over 60% of the time. Belpex and APX prices were identical in 73% of the time while Powernext and Belpex prices were identical in 85% of the time.

Trilateral Market Coupling contributed to the development of the now liquid Belgian spot electricity market and consequently made possible the establishment of Belgium's power exchange, Belpex.

The use of interconnection capacity has since increased significantly as in November 2007, the utilised daily allocated cross border capacity on the Dutch-Belgian interconnection increased from 347 MW to 544 MWh. The Belgian-French interconnection saw similar trends with increasing utilisation of cross border capacity. Dutch imports and export flows both increased since the introduction of Trilateral Market Coupling. ▶



New Services

In February 2008 APX announced the launch of an OTC Broker Give-up Service for APX Power UK. This allows a leading energy broker, Tullett-Prebon, to enter members' orders into the EuroLight™ trading platform for clearing and notification by APX. This gives the UK Power market greater flexibility for Prompt Power clearing arrangements. The service is only available to full APX Power UK members and has been active since 25th February 2008. The new service will be introduced for APX Gas UK members later in the year.

In February 2008 APX also introduced Trayport trading arrangements into the Market Rules for the APX UK Gas & Power markets. This allows members to access the APX markets through the Trayport GlobalVision interface, without the need to sign up to any additional legal agreements.

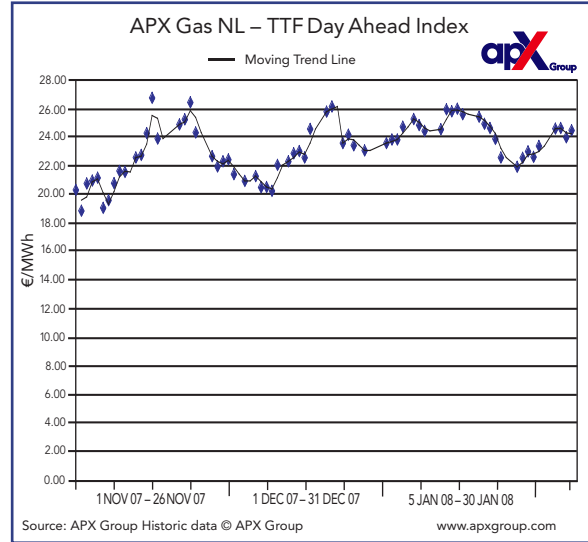
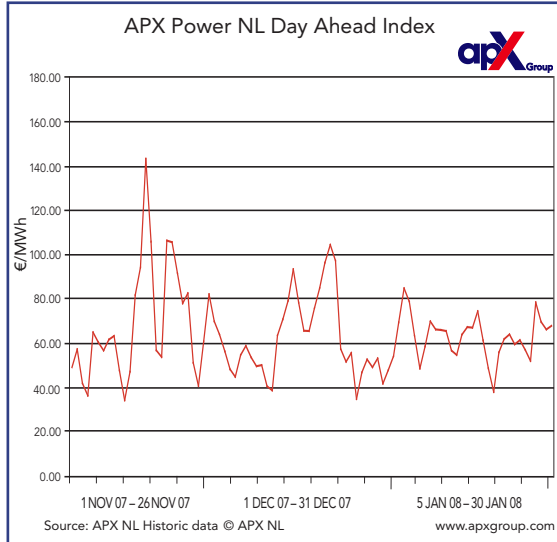
Memberships

Memberships on the APX exchanges has increased with the addition of Citi (Citigroup Global Markets Ltd), a leading global financial services company, which joined APX Power NL as trading Member. Citi was already a Member of APX Gas UK.

Additionally Gazprom (Gazprom Marketing & Trading Ltd), the UK based subsidiary of OAO Gazprom, joined APX Power NL as trading Member. Gazprom is already a Member of APX Gas UK, APX Gas NL and APX Gas ZEE. ■



APX Indices



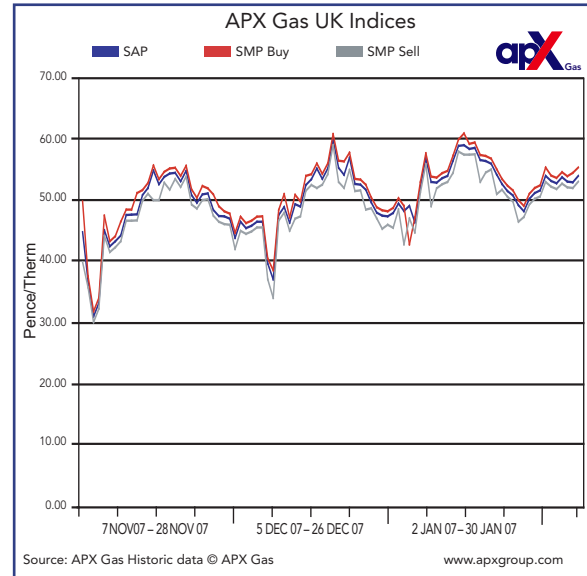
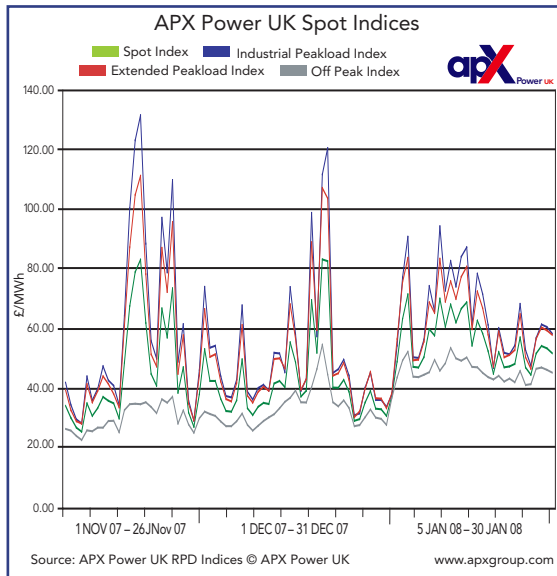
APX Power NL Day Ahead Average Prices

The APX published average prices are comprised of base load, off peak and peak load (07.00 - 23.00) prices based on the average price (in Euro/MWh) of Dutch power traded every day on APX for delivery the next day. Weekend prices are only comprised of base load prices and volumes.

APX Gas NL TTF Day Ahead Index

The Index is a volume weighted average price (VWAP) of all day-ahead trades executed and matched on APX at the TTF gas hub between 06.00 and 18.00 CET (05.00 and 17.00 UK time) for delivery the next day. ▶

APX Indices



APX Power UK Spot Indices

The APX Power UK Spot Indices are based on the APX Power UK Reference Price Data (RPD) which is a half hourly price derived from the volume weighted average price of all Half Hour, Two Hour and Four Hour Block contracts traded within seven calendar days of market closure on APX Power UK.

Spot Price Index (base load) –

The average of the RPD prices for all 48 half hour settlement periods.

Peak Load Index – The average of the RPD prices for half hour settlement periods between 07.00 - 19.00.

Extended Peak Load Index –

The average of the RPD prices for half hour settlement periods between 07.00 - 23.00.

Off Peak Index – The average of the RPD prices for the Off Peak half hour settlement periods, between 23.00 - 07.00 and 19.00 - 23.00 in the same EFA day.

APX Gas UK Indices

SMPbuy is the highest price that gas was traded (buy or sell) by Transco in its Network Code balancing role for delivery that gas day. In the event of no Transco action, the SMPbuy is calculated by a default setting of 0.0287p/kWh (0.8411p/therm) from the prevailing SAP.

SAP is the volume weighted average price of all trades on the OCM platform.

SMPsell is the lowest price that gas was traded (buy or sell) by Transco in its Network Code balancing role for delivery that gas day. In the event of no Transco action, the SMPsell is calculated by a default setting of -0.0324p/kWh (-0.9496p/therm) from the prevailing SAP. ■

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