



CHAPTER 1

Valuing Carbon

The only way in which the international community will limit the rise in carbon emissions is if governments, industry and individuals take into account the costs associated with the emissions for which they are responsible. A key role for Government is to put in place a framework which, by placing a value on carbon, provides a financial incentive for businesses and households to incorporate the climate change impact of their activities.

1.1 A carbon price is essential for making lower carbon emissions a business imperative. Companies that face a price for carbon will be incentivised to reduce their emissions, either through energy efficiency improvements, investing in new technology, or switching to the use of less carbon-intensive sources of energy.

1.2 Establishing a price for carbon is best done internationally because climate change is a global problem requiring collective action. Reducing carbon emissions can incur costs. These costs differ depending on country, sector and company specific factors. Acting together through international agreements provides the widest range of options for reducing carbon emissions, so that the most cost-effective can be taken up first. It also avoids potential distortions in international competitiveness.

1.3 The UK's carbon policy framework comprises a number of international and domestic policy measures. Some of these generate a value for carbon directly (such as the Climate Change Levy); others generate an effective price through a regulatory framework (such as the European Union Emissions Trading Scheme (EU ETS), the Renewables Obligation and the Energy Efficiency Commitment).

1.4 The introduction of the European Union Emissions Trading Scheme (box 1.1) in January 2005 effectively created the world's first international carbon market. The UK has played an active role in the creation and development of the EU ETS, which forms the cornerstone of our carbon policy framework.

BOX 1.1: THE EUROPEAN UNION EMISSIONS TRADING SCHEME (EU ETS)

The European Union Emissions Trading Scheme (EU ETS) represented a major step forward in EU action to reduce emissions from carbon. The EU ETS currently covers around 11,000 power stations and large businesses across Europe, responsible between them for about half of the EU's carbon emissions. Each Member State sets a target level of emissions and allocates 'allowances' to emit carbon dioxide (measured in tonnes).

BOX 1.1 continued

The overall number of allowances allocated should be set below industry's normal emissions levels; each company with a shortfall must either reduce its own carbon emissions or buy allowances from other companies. This enables companies who can easily lower their carbon emissions to make large cuts in emissions and sell their allowances to those who find it harder to do so. The benefits of creating such a market is that it allows emissions reductions to occur where it is most cost-effective.

The buying and selling of allowances between companies creates a carbon price (expressed in Euros per tonne of carbon dioxide – €/tCO₂). The trading periods for buying and selling run in set phases. Phase I of the scheme covers the period 2005 to 2007, with the second phase running from 2008 to 2012.

Any emitter that does not hold sufficient allowances to cover its emissions is liable to pay an 'excess emissions penalty' of €40 for each tonne of carbon dioxide emitted not covered by allowances under Phase I (rising to €100 in Phase II). Even having paid the financial penalty, the developer will still have to ensure they hold an amount of allowances which includes the excess emissions in the following year, thereby creating further incentives to reduce emissions rather than face the penalty.

The EU ETS does not, in itself, determine the amount of carbon emissions saved within the UK over time – this will be determined by the price of carbon (which is determined internationally) relative to the cost of lowering emissions in the UK. If investment in reducing carbon emissions in the UK remains expensive relative to the EU and beyond, the effort we require of industry in the UK will not necessarily translate into emissions reductions here. But emissions will be reduced globally through the efforts of UK organisations. This is important, given the need to reduce concentrations of greenhouse gases on a global scale, and for these reductions to take place in the most cost-effective way.

In some cases, UK efforts to reduce carbon emissions also may result from investment in one of the 'flexibility mechanisms' under the Kyoto Protocol to which the EU ETS is linked. These are the:

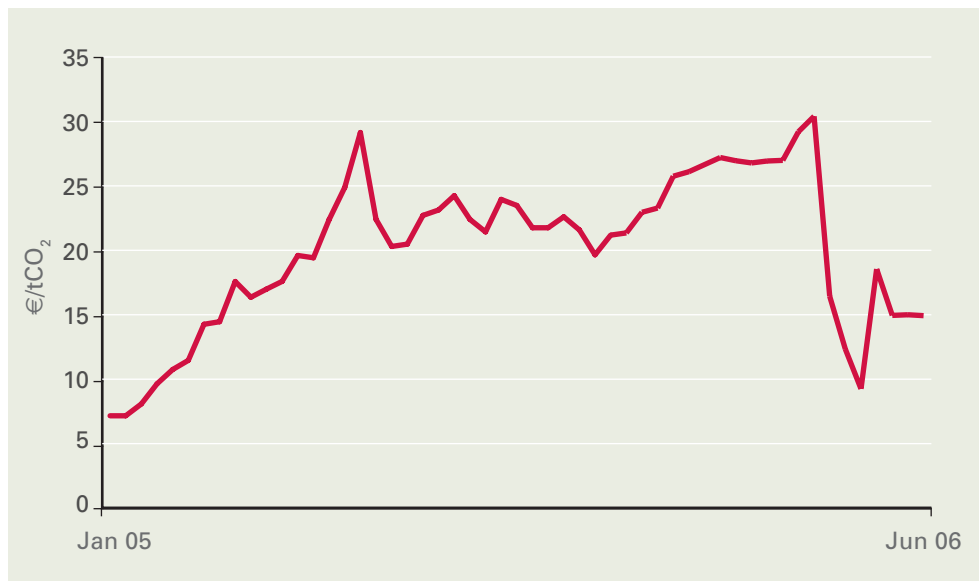
- Clean Development Mechanism (CDM) – a mechanism that allows developed nations to achieve part of their reduction obligations under the Kyoto Protocol by funding projects in developing countries that reduce emissions; and
- Joint Implementation (JI) – a programme under the Kyoto Protocol that allows industrialised countries to meet part of their required cuts in greenhouse gas emissions by paying for projects that reduce emissions in other industrialised countries).



1.5 The market for carbon under the EU ETS is still developing, but already around €7.2 billion worth of carbon trading has occurred in the first year of the EU ETS, with a growth in financial products, and a massive upsurge in investment in the Clean Development Mechanism (CDM) – from \$400 million in 2004 to \$1.9 billion in 2005.

1.6 The volatility in the carbon price since the EU ETS began (see chart 2) reflects, in part, a nascent EU ETS that is continuing to develop and evolve. But the price volatility also reflects some of the underlying aspects of the EU ETS (such as current information reporting arrangements) that need to be strengthened in order to improve its future effectiveness.

CHART 2: THE EU EMISSIONS TRADING SCHEME ALLOWANCE PRICE, JAN 05 – JUN 06



Source: DTI, 2006

1.7 There is uncertainty for investors regarding the coverage and structure of future phases under the EU ETS. A clear and stable long-term carbon policy framework is important for creating the confidence and certainty that is needed to underpin changes in industry behaviour. This is particularly important for investments in long-lived assets (such as power stations) because the profitability of such investments is affected by the carbon price years into the future, along with other factors, such as fuel prices, technology risk and regulatory/planning risks (some of which are discussed in other parts of this report). Investors have to take a view on how these factors will change over time, affecting the returns on their investment. But the carbon price is generated through a scheme which operates under parameters (for example, caps on emissions) set by governments. Uncertainty over the future shape and development of these parameters will create difficulties for investors.

1.8 A number of factors could reduce this uncertainty. For instance, the European Commission has made strong statements on its intention to ensure real scarcity of permits in the EU ETS for Phase II, stating it will use all the political and legal tools at its disposal to do so. The reconciliation results of the first year of the first phase of the Scheme will provide a more reliable base for the Commission's assessment of plans.

1.9 However, while the market for carbon allowances is likely to become progressively tighter, certain factors (such as legislative delays) could lead to a lack of market clarity. In the absence of a clear and stable carbon policy framework, investors may consider delaying investment decisions. If investment is not timely, this could create risks of a tighter supply-demand balance in the electricity sector (and hence potential energy price volatility). The absence of such a longer-term framework may also discourage investment in low carbon technologies. This could undermine the ability to deliver significant carbon savings towards our 2050 goal.

1.10 The Government is fully committed to the EU ETS – it is the best long-term mechanism for securing least-cost emissions reductions across the EU. The EU ETS has the potential to form the basis of a long-term global carbon trading market. It will remain the central element of the UK's emissions reductions policy framework, with its continued existence beyond 2012 assured under European legislation, which includes rules for setting the level of emissions reduction required.⁶

1.11 Phase II of the EU ETS will play a critical role in helping to set the future direction of travel for the EU ETS. Government recently announced a cut in the UK's allocation of 8MtC (below business as usual levels) under Phase II, which is consistent with moving towards our long-term 60% carbon reduction goal and illustrates our strong commitment to the Scheme. But we must now work with others to ensure that, across the EU, the Scheme creates clear incentives for early investment in low carbon technologies and continues to drive reductions in carbon emissions at least cost.

1.12 The Government will continue to work with the European Commission and the other EU Member States regarding the direction, ambition and future reinforcement of the EU ETS. Strengthening and reinforcing the Scheme is necessary to provide firms with the long-term certainty they need.

1.13 The Government will also aim to secure agreement to a number of changes to the Scheme which will help to strengthen it post-2012. These include:

1.13.1 **Providing greater clarity on when and how limits (caps) on emissions will be decided in future.** Announcing our long-term intentions for the EU ETS will provide early certainty for investors in low carbon technologies and signal an EU-wide commitment to reducing carbon emissions beyond 2012. We need to signal the direction of EU emissions reductions much further into the future. And we will continue to set our caps in a manner that ensures the UK plays its part in reducing overall EU carbon emissions, consistent with our 60% carbon reduction goal by 2050.

⁶ Unless revised as a result of the review of the EU ETS Directive, future caps must be consistent with the factors outlined in Annex III of the Directive, which includes Kyoto obligations and the potential to reduce emissions.



1.13.2 Simplifying and harmonising the Scheme, particularly the way that allowances are allocated, so that there are clear and strong incentives to invest in low carbon technology, and to prevent distortions to the EU internal market. Across the EU, the methods used to allocate emissions allowances must move towards clearly rewarding clean technology while not creating incentives for industry to increase their emissions in order to gain higher allocations in the future. This will require EU action to:

- rule out updating of baselines for ‘grandfathering’ (the method used to allocate allowances based on historical emissions);
- use a more standardised allocation methodology across EU sectors through ‘benchmarking’ (the method used to allocate allowances for emissions based on average emissions by product); and
- move towards more auctioning of allowances.

1.13.3 Ensuring the market functions more efficiently. Improving the transparency of information on allocations in advance of trading periods will improve visibility on the fundamentals driving long-term EU allowance prices. Clear, easily accessible information on final allocations – as well as the basis of allocation decisions – should be made freely available to ensure confidence in the EU ETS market.

1.13.4 Considering whether more sectors – and more greenhouse gases – should be included in order to maximise opportunities for significant, cost-effective carbon savings. Such consideration should take into account, among other factors, the technical potential to reduce emissions, the costs of abatement, the regulatory burden on industry and the impact on sectors already in the Scheme.

1.13.5 Thinking globally to develop a more liquid and efficient market. The Kyoto Protocol has established the international framework for a truly global carbon market. The EU ETS is the largest of several carbon markets worldwide, and already links to Kyoto Mechanisms (JI/CDM – see box 1.1) outside the EU, incentivising significant investment in developing countries. Industries covered by the EU ETS can use credits from the JI and CDM markets to meet their obligations in the EU scheme, although the limits to their usage are set by each EU Member State. The UK is committed to working with international partners to deliver a strengthened international framework for the global carbon market through international agreement at UN level. In the interim, the focus should be on ensuring a consistent, robust approach to the use of credits across the EU in Phase II. Maintaining markets for credits from JI/CDM projects beyond 2012, as well as linking the EU ETS to other carbon markets as they are implemented, will also be crucial to encouraging market investment and confidence, and fostering the development of an efficient global carbon market up to and beyond 2012.

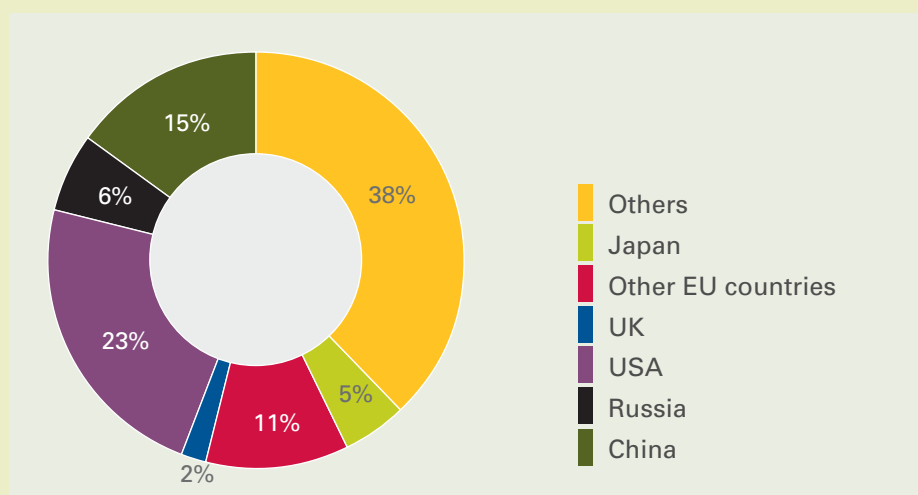
BOX 1.2: TACKLING CLIMATE CHANGE

Climate change is a global problem requiring urgent international collective effort built on a shared understanding of the scale of action needed to stabilise the climate. There must be a shared commitment to take action in response, involving national and local governments, businesses and individuals.

Climate change will only be addressed through both technological development and a robust, inclusive and binding international treaty. For that reason the Prime Minister has said that the international debate must focus on the scale of action needed, and how the international framework needs strengthening to deliver it. Without greater clarity on what we are trying to achieve in the long term, it is very unlikely that the world's short-term efforts will put us on the right path. A long-term goal would send an essential signal to the private sector and others who have a key role in delivering low carbon technologies. Uncertainty leads to delayed or short-term decision-making, and risks negative consequences for competitiveness and security of energy supply.

A clear, disciplined multilateral framework that produces the investment in research and development in science and technology is needed to create a global low carbon economy. The UK, working in partnership with other countries, can play a leading role in assembling this framework, drawing on important lessons learnt in different countries and sectors. The UK cannot act alone – with UK emissions of carbon dioxide comprising only 2% of global carbon dioxide emissions (in 2003), it is imperative that all nations play their part (see chart 3).

CHART 3: GLOBAL EMISSIONS OF CARBON DIOXIDE, 2003



Source: IEA, 2005.



In recognition of the global nature of the problem, the **United Nations Framework Convention on Climate Change (UNFCCC)** was agreed at the Earth Summit in Rio de Janeiro in 1992. To date, 189 countries have ratified it, including all major developed and developing countries. The ultimate aim of the Convention is to stabilise greenhouse gas concentrations in the atmosphere at a level that would avoid dangerous anthropogenic climate change.

The **Kyoto Protocol** (to the UNFCCC), agreed in December 1997, was designed to establish agreed, deeper cuts in emissions needed to prevent serious interference with the climate. Developed countries agreed to reduce their overall emissions of a basket of six greenhouse gases by an average of 5.2% below 1990 levels over the period 2008 – 2012, with differentiated, legally binding targets. The Protocol came into effect on 16th February 2005 and provides the first ever framework for international action with binding targets and timetables for reducing greenhouse gas emissions. With over 150 countries having ratified it, the Protocol represents a very important milestone in tackling climate change.

But the Kyoto Protocol is only the first step, mapping action for the first commitment period (2008 – 2012). At the UN meeting in Montreal in December 2005, all countries agreed to begin discussions on the way forward beyond 2012. It is vital that all major countries are part of a future framework for action, including the US and major developing economies like China, India and Brazil. It was against this background that the Prime Minister put climate change on the international political agenda in 2005 by making it a priority for the UK's Presidencies of the G8 and EU.

The **G8 Gleneagles Plan of Action** aims to increase the speed with which we reduce greenhouse gas emissions. **The Gleneagles Dialogue on Climate Change, Clean Energy and Sustainable Development** aims to provide a forum for continuing discussions amongst the G8, China, India, Brazil, South Africa, Mexico, and other countries with significant energy needs. It enables participating countries to work together to speed up international progress on the shared challenges of addressing climate change, energy security and access to energy. One of the key outcomes from Gleneagles was agreement to establish the Energy Investment Framework led by the World Bank and other international finance institutions to fund investment in clean energy technologies over the next few years. This will be a powerful facility to engage with developing economies, and to incentivise their move towards low carbon technologies.

The EU has played an important leadership role in tackling climate change. The UK is keen to work with EU partners to secure agreement to further action in the EU, in particular strengthening the Emissions Trading Scheme beyond 2012 and making it the heart of a global carbon market. The UK will also work in partnership with the EU to enhance our efforts to help India, China and other developing countries grow their economies on a sustainable, low-carbon path.

BOX 1.2 continued

A sound understanding of the global economic implications of climate change is an essential foundation for an informed international debate about the future. The Stern Review on the Economics of Climate Change, which will report to the Prime Minister and Chancellor in autumn this year, will contribute to this understanding, by setting out how climate change could impact on growth and development, identifying the costs and opportunities from tackling it, and exploring elements of a robust international response.

1.14 The UK will also need to ensure that its work on international climate change is closely aligned with issues relating to security of supply and international energy security. Policy and objectives between these two areas, which together combine to pose the global energy challenge, should be very closely linked.

1.15 It is vital that we progress our priorities for strengthening the EU ETS in a timely manner given the significant investment challenge currently facing the UK electricity generation sector. It is likely that we will need new electricity generation investment equivalent to around one-third of our existing capacity, and given these assets typically have lives of some 20 – 40 years, it is essential that a clear and stable carbon policy framework is in place to incentivise timely and low carbon investment.

1.16 The Government is committed to there being a continuing carbon price signal which investors take into account when making decisions. This is particularly important given the scale of new investment required in UK electricity generation capacity. The EU ETS is here to stay beyond 2012 and will remain the key mechanism for providing this signal. The Government will continue to work with its international partners to strengthen the EU ETS to make it more effective. We will keep open the option of further measures to reinforce the operation of the EU ETS in the UK should this be necessary to provide greater certainty to investors.



Proposals on Valuing Carbon

The Government will aim to secure EU agreement to a number of changes to help strengthen the EU ETS post-2012. These include:

- Providing greater clarity on when and how caps/limits on emissions will be decided in future;
- Simplifying and harmonising the EU ETS, particularly the way that allowances are distributed, so that there are clear and strong incentives to invest in low carbon technology, and to prevent distortions to the EU internal market;
- Ensuring the market functions more efficiently;
- Considering whether more sectors – and more greenhouse gases – should be included in order to maximise opportunities for significant, cost-effective carbon savings; and
- Thinking globally to develop a more liquid and efficient market.

The Government is committed to there being a continuing carbon price signal which investors take into account when making decisions. The EU ETS will remain the key mechanism for providing this signal. The Government will continue to work with its international partners to strengthen the EU ETS to make it more effective. We will keep open the option of further measures to reinforce the operation of the EU ETS in the UK should this be necessary to provide greater certainty to investors.