

European Emissions Trading at the Crossroads

Developing proposals for Phase III and beyond

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List of abbreviations

BAU	Business as usual
CDM	Clean Development Mechanism
CER	Certified Emissions Reductions
CH ₄	Methane
CO ₂	Carbon dioxide
ERU	Emission Reduction Units
EU ETS	European Union Emissions Trading Scheme
ETS	Emissions Trading Scheme
F-gas	Fluorinated gases
GGAS	Greenhouse Gas Abatement Scheme
JI	Joint Initiative
LFG	Land fill gas
LULUCF	Land use, land use change and forestry
MtCO ₂ e	Million tonnes CO ₂ equivalent
NAP	National Allocation Plan
N ₂ O	Nitrous oxide
RGGI	Regional Greenhouse Gas Initiative
UNFCCC	United Nations Framework Convention on Climate Change

Executive summary

Tackling climate change is one of the highest priorities of the European Union. The centrepiece of this response has been the development of the European Emissions Trading Scheme (EU ETS). Almost half the European economy is covered by the EU ETS, which provides companies within the scheme with a cost-effective means of abating their CO₂ emissions.

The first phase of the EU ETS has been designated as a preliminary phase of trading, and is running from 2005 to 2007. The second phase, running from 2008 to 2012, coincides with the first commitment period of the Kyoto Protocol. Inevitably, there have been difficulties during the first phase, and there are still opportunities to improve the workings of the EU ETS. As a result, the European Commission is commencing a review of the EU ETS, with a view to improve the trading scheme beyond Phase II. Initial proposals are due to be published by the European Commission by 30 June 2006, with specific legislative proposals likely to follow in 2007.

Since spring 2006, the Institute for Public Policy Research (ippr) has been conducting a research project, 'Building on the European Emissions Trading Scheme'. The project considers the role that the EU ETS can play in the longer term, as part of a European and global effort to cut greenhouse gas emissions. This report is intended as a preliminary discussion paper, and aims to consider options rather than reach conclusions. It will be shared at seminars in London and Brussels in mid-2006, and a more detailed report will be published at the end of the year.

The ippr project focuses in particular on three strategic issues that will be central to the future of the EU ETS:

1) Ensuring emissions reductions are achieved

- In the preliminary phase, the EU ETS has not delivered emissions reductions, which has undermined the credibility of the scheme.
- The process of setting National Allocation Plans (NAPs) needs to be reformed so that the EU ETS can deliver emissions reductions. Currently, member states set their own NAPs through opaque, decentralised processes. NAP-setting processes could either be harmonised within a decentralised framework, or assured emissions reductions might be provided through a more centralised NAP-setting process.
- Investment certainty could be improved through alterations to the architecture of the EU ETS. For instance, it might be possible to extend the trading periods or set indicative, long-term emissions reductions targets.

2) Expanding the EU ETS

- Currently the EU ETS covers the carbon dioxide emissions of power stations and many energy-intensive industries.
- The EUETS could be expanded to include more large energy intensive emitters. However, 50 per cent of the installations currently covered by the EU ETS account for only 0.8 per cent of total emissions. There is therefore also potential to simplify the scheme to reduce the administrative burden on small emitters.
- The EU ETS could be expanded to include new sectors outside the energy-intensive and power station sector. Already the European Commission is intending to include the aviation sector. Should this occur, the possibility of including the maritime and surface transport sectors could be next on the agenda.

3) Establishing a global carbon market

- The primary purpose of trading is to reduce emissions within the European Union.
- But EU ETS operators can already buy in some emissions credits from greenhouse gas abatement initiatives in developing countries through Clean Development Mechanism (CDM) and Joint Implementation (JI) projects. The European Commission is interested in linking the EU ETS to emerging trading schemes around the world.
- These measures could lead towards the establishment of a global carbon market that could help finance sustainable, low carbon development in middle- and low-income countries and also support diplomatic efforts to extend international action on climate change.

The main thrust of the EU ETS review will be to consolidate the trading scheme as it stands. Nevertheless, where it is practically possible, the broader, strategic direction of emissions trading should also be considered. In the longer term, these will be the key issues that determine the future of emissions trading.

1. Introduction

The European Union Emissions Trading Scheme (EU ETS) is the single most important policy instrument in the EU and UK climate change programmes¹. Emissions trading is potentially the most efficient and cost-effective means of delivering emissions reductions to agreed levels. Furthermore, the scheme is wide in scope, covering around half the carbon dioxide emissions in the UK and EU that come from energy-intensive industries and power stations (but excluding emissions from international shipping and aviation).

The EU ETS also has a facility to buy in trading credits from low carbon-energy projects in developing countries. This can help to finance low carbon, sustainable development in low- and middle-income countries, while providing the EU with low-cost greenhouse gas abatement options. There may also be opportunities for the EU to play a leadership role in establishing global emissions trading by linking the scheme to other emerging national and regional emissions trading schemes.

Yet there are still fundamental weaknesses in the design of the EU ETS – and, equally, opportunities to improve its workings. Initial proposals to improve the EU ETS beyond Phase II (which runs from 2008-12) are due to be published by the European Commission by June 30 2006, with specific legislative proposals likely to follow in 2007. Article 30 of the EU ETS Directive (EU 2003) suggests the terms of reference for the review, including:

- whether transport should be included in the scheme
- the relationship between the EU ETS and international emissions trading
- further harmonisation of cap- and National Allocation Plan (NAP)-setting processes.

This preliminary discussion paper aims to initiate debate on these issues. It will be shared at seminars in London and Brussels during mid-2006. A more detailed final report, feeding into the European Commission's review, will be published at the end of the year.

The European Environment Commissioner, Stavros Dimas, has suggested that discussions on the EU ETS review could be organised into two categories (Dimas 2005). First, there are those discussions about fine-tuning the scheme, without making fundamental changes to the legal framework of the EU ETS. So far, most discussions have considered how the EU ETS could be consolidated in the short and mid term. Second, the review also provides an opportunity to take a longer-term view of the future of the trading scheme, and this paper focuses particularly on three of these longer-term issues:

Ensuring emissions reductions are achieved

- In the preliminary phase, the EU ETS has not delivered emissions reductions, which has undermined the credibility of the scheme.
- The NAP-setting process needs to be reformed so that the EU ETS can deliver emissions reductions. Currently, member states set their own National Allocation Plans through opaque, decentralised processes. NAP-setting processes could either be harmonised within a decentralised framework, or assured emissions reductions might be provided through a more centralised NAP-setting process.
- Investment certainty could be improved through alterations to the architecture of the EU ETS. For instance, it might be possible to extend the trading periods or set indicative, long-term emissions reductions targets.

Expanding the scheme

- Currently, the EU ETS covers the CO₂ emissions of energy-intensive industries and power stations. The European Union could include more industrial units and more greenhouse gases from energy-intensive industries in the EU ETS. The scheme could also be simplified in order to reduce the administrative burden on small emitters.
- In addition, the EU ETS could be expanded to include sectors outside the energy-intensive industry and power sectors. Already, the European Commission is intending to include the aviation sector. Should

1. For an explanation of how the EU ETS works, see Appendix 1, page 23

this occur, the possibility of including the maritime and surface-transport sectors could be next on the agenda.

Establishing a global carbon market

- While the primary purpose of trading is to reduce emissions within the European Union, EU ETS operators can acquire credits from Kyoto's flexible Clean Development Mechanism (CDM)/Joint Implementation (JI) projects, and the European Commission is also interested in linking the EU ETS to emerging trading schemes around the world. These measures could lead towards a global carbon market being established, which could help finance sustainable, low carbon development in middle- and low-income countries and also support diplomatic efforts to extend international emissions trading.

2. Encouraging carbon abatement efforts

It is commonly agreed that first and foremost, the EU ETS plays a vital role in the efforts of the European Union as a whole, as well as of individual member states, to reduce carbon emissions. The EU ETS Directive already notes that trading should be an integral part of meeting Kyoto targets: ‘The total quantity of allowances [...] shall be consistent with the Member State’s obligations to limit its emissions pursuant to [...] the Kyoto Protocol’ (European Union 2003: 1). These obligations are to reduce greenhouse gas emissions from 2008 to 2012 by eight per cent from 1990 levels.

There are also ambitions that the EU ETS will be a keystone of European emissions reductions after 2012 (Stern 2006a). This would require stringent NAP-setting processes, encouraging investment in low carbon technologies to reach the EU Environment Council’s aspirational greenhouse gas emissions targets of 15-30 per cent reductions from 1990 levels by 2020, and 60-80 per cent reductions by 2050 (Commission of the European Communities 2005).

The EU ETS is also integral to the future of international emissions trading worldwide. EU ETS trading will dominate the international investment flows under the Kyoto mechanisms (see Table 2.1). Its success, or otherwise, will influence perceptions of the efficacy of international emissions trading during the Kyoto phase, and opinions of what is possible after 2012.

Table 2.1: Financial size of the international carbon markets

Credits	2004		2005	
	MtCO ₂ e*	Million Euro	MtCO ₂ e*	Million Euro
EU ETS	17	127	362	7,218
CDM*	60	188	401	2,035
Jl*	9	27	28	96
Other	7.9	34	7.8	52
Total	94	377	799	9,401

*Notes: CDM: Clean Development Mechanism; Jl: Joint Implementation; Other: Includes credits from other trading schemes; MtCO₂e: Million Tonnes of CO₂ equivalent.

Source: Point Carbon (2006: iii)

However, the trading scheme is still a long way from meeting these ambitions. In Currently, the NAP-setting process is opaque and decentralised. Also, member states have often been cautious about setting bold, unilateral targets. Commenting on the Phase II NAP-setting process, one minister noted: ‘We can wait and see what other Member States offer. We will not in some masochistic way be trying to outdo other Member States’ (WWF 2006: 4). Thus the EU ETS has so far delivered few emissions reductions. In Phase I, 1829.5 million tonnes of emissions allowances are allocated per year, yet in the first year of trading (2005), participants only emitted 1785.3 million tonnes (European Union 2006).

The primary task of the EU ETS review is to rebalance the trading scheme in order to increase the levels of co-ordination and transparency within the decentralised scheme. However, beyond this task lies a fundamental challenge. Using the EU ETS to stimulate low carbon investment in the longer term requires stronger price signals and more market certainty. This means that the EU will have to take bold action, while addressing the cost-competitiveness concerns of EU ETS operators and making sure that the trading scheme remains in step with the post-2012 international policy architecture and with the future of international emissions trading.

The current design of the EU ETS

In the original 2000 EU Green Paper (European Union 2000), the European Commission suggested two models of emissions trading: a centralised common community scheme, and a more decentralised, harmonised, co-ordinated community scheme (which was eventually adopted) that allowed greater member state autonomy. The Green Paper noted that if a co-ordinated scheme were to ensure a level

playing field, the European Commission would need to play ‘an active role in overseeing what the Member States were doing, and in evaluating the effects on competition between comparable companies in different Member States’ (European Union 2000: 15).

However, a co-ordinated scheme has not emerged in Phase I of the EU ETS. Annex III of the EU ETS Directive allows member states to use policies and measures outside the EU ETS to meet their national emissions-reduction targets that, under current reporting regulations, cannot be easily monitored (European Union 2003). This situation is further confused because the congruence between the Kyoto Protocol and EU ETS is not clearly defined. Although the Kyoto Protocol covers six greenhouse gases, the EU ETS only covers CO₂. Furthermore, while the Kyoto Protocol covers emissions across the entire domestic economy, the EU ETS currently covers around half the EU economy.

Thus, many countries have set weak caps and NAPs, using a wide range of complex methodologies. Some, such as Italy, have set caps using bottom-up ‘business-as-usual’ (BAU) projections, which are sometimes inflated. Others, such as Germany, have set caps simply through a bargaining process between ministries and industry. Others still, such as the Netherlands, have taken the view that CO₂ abatement will be delivered by mechanisms other than the EU ETS, and targets have been correspondingly lax (Ilex Energy Consulting 2005a).

The means by which allowances are allocated also play a significant role in determining the effectiveness of the trading scheme. Most notably, this relates to updating provisions, especially the allowance allocations granted to new entrants and rules related to closure. Some of these provisions have not incentivised carbon abatement measures. For instance, in Germany new coal plants were allocated free allowances for 14 years (Ilex Energy Consulting 2005b). In addition, repeated allocations to incumbents can also lead to significant distortions, as Table 2.2 indicates.

Table 2.2: Distortions that follow from updating various allocation methodologies

Distortion	Allocation method					
	Auction	Capacity	Capacity and technology	Historic output	Historic output and technology	Historic emissions
Discourage closure of plants (type 1*)		✓	✓	✓	✓	✓
Discourage closure of inefficient plants (type 1*)			✓		✓	✓
Increase operation of inefficient plants (type 2*)				✓	✓	✓
Reduce incentives for efficiency-improving investment (type 3*)						✓

*Notes: Type 1: excess carbon-intensive capacity; Type 2: inefficient fuel choice; Type 3: less energy-efficient investment.

Source: Grubb (2006: 8)

A further issue is that the opacity of NAP-setting processes has affected the political acceptability of the EU ETS in Phase I. Member states used a multitude of methodologies to allocate their allowances between industrial sectors, and this resulted in convoluted systems. For example, allowance allocations might be decided by a one-step methodology in which allocations are divided between all installations falling within the ETS, according to a single measure. Alternatively, under a two-step methodology, a state might divide the installations into a variety of sectors, and then divide allowances unevenly between each sector. In each sector, allowances might then be allocated in proportion to a variety of measures.

Towards a co-ordinated trading scheme?

An immediate task is to move towards a co-ordinated trading scheme that incentivises carbon-abatement measures. Given that many member states inflated their BAU projections and over-allocated emissions allowances, the European Commission has to ensure that these NAPs are more realistic and transparent than they are currently.

A recent study conducted by the environmental protection agencies of five member states (Environment Agency 2006a) suggests that member states' BAU projections should contain prescribed information that allows accurate assessment of their growth rates, and that the European Commission should evaluate these calculations using a standardised assessment tool. This data could allow a realistic evaluation of the extent to which each member state was using the EU ETS to contribute towards meeting Kyoto targets. This information could also allow each sector's emission-reduction contribution to be better evaluated, providing information on whether comparable effort is being made across sectors and countries (Environment Agency 2006a, Centre for European Policy Studies 2005).

Repeated allocations to incumbents can also lead to significant distortions. In the most effective system in which the carbon price is taken fully into account, member states allocate all their emissions allowances by auctioning. However, in Phase I of the EU ETS, governments have only had discretion to auction up to five per cent of their allowances, and up to 10 per cent can be auctioned in Phase II. Only four member states (Denmark, Hungary, Ireland and Lithuania) auctioned part of their emissions allowances in Phase I, accounting for 0.2 per cent of the entire EU emissions budget (Schleich and Betz 2005).

In subsequent phases, the European Commission and member states need to increase the proportion of allowances that are auctioned. In the meantime, member states could auction the maximum possible number of allowances – perhaps using auctioning in sectors that have made windfall profits from the EU ETS, because these sectors can pass carbon costs on to customers (Ilex Energy Consulting 2005b, IPA Energy Consulting 2005).

It is likely that a proportion of allowances will continue to be allocated free of charge after Phase II. However, here too, improvements can be made. A major step forward would be for the European Commission to seek to develop common allowance allocation methods that use benchmarks based on capacity. This would be a major undertaking, requiring agreement on common measures (a difficult negotiation, since some member states will fare better than others) and extensive data processing. Nevertheless, once industry benchmarks had been agreed, it might be relatively easy to tighten them (Centre for European Policy Studies 2005).

Towards deeper emissions reductions in the EU ETS?

Beyond this task, the review faces the difficult task of considering how the EU ETS could drive deeper emissions reductions. If countries are to tackle climate change seriously, this will require tighter targets and higher carbon prices for a number of decades in the context of a post-Kyoto agreement on international emissions trading.

Assuming that a 'Kyoto+' agreement building on the current Kyoto Protocol emerges from international negotiations, a bold approach that would lead to definite emissions reductions would be to set a top-down, EU-wide ETS cap that contributes proportionately to post-Kyoto targets. Determining the total number of allowances that fall within the EU ETS cap would require a complex calculation, made at European Union level, of how Kyoto targets, which cover six gases across all sectors of the economy, could be translated into a European-wide cap for the EU ETS. This fixed number of allowances could then be distributed among member states.

These decisions would not be easy, for the following reasons. First, it would be politically difficult to move away from the current, decentralised, process of determining the overall EU cap towards a scheme in which the total number of allowances were centrally fixed.

However, the EU did conclude a burden-sharing agreement whereby the EU's eight per cent emissions-reduction target under the Kyoto Protocol was divided up – with, for example, the UK agreeing to a 12.5 per cent greenhouse gas reduction while Spain was permitted a 15 per cent increase. This agreement was informed by a 'triptych' methodology that equitably shares emissions. The approach distinguishes between three broad emissions sectors – the power sector, energy-intensive industries and residential and transport emissions – with allowance made for the need for economic development (Sugiyama 2005). It need not be

impossible that EU ETS targets could be derived from post-Kyoto targets using similar methodologies.

Second, it will be difficult to establish a European Union scheme that raises carbon prices because, for a few specific sectors of industry, price rises will lead to corresponding competitiveness concerns. For instance, studies have indicated that if CO₂ is traded at Euro25 per tonne, this might lead to product price rises of 7.3 per cent in steel (Carbon Trust 2004). Nevertheless, there are also other sectors included in the EU ETS, such as the power sector, that are relatively unaffected by carbon costs, because they can pass these on to consumers.

For those sectors whose competitiveness is affected by price rises, the challenge is to co-ordinate collective action and share the costs of carbon abatement. Thus, higher price rises within the EU ETS are likely to be achieved within the context of a renewed global commitment to international emissions trading. In this sense, the future of the EU ETS is intimately linked to the course of negotiations on what will follow the first phase of the Kyoto Protocol.

Towards increasing investment certainty?

Without a clear sense of the future of the EU ETS in Phase III and beyond, the scheme only incentivises short-term operational adjustments, rather than acting as an investment driver.

In one sense, this issue cannot be fully resolved until the future of international emissions trading is determined. The purpose of the EU ETS is to contribute to meeting emissions reductions targets agreed under the Kyoto Protocol. Indeed, the architecture of the EU ETS is very much built around Kyoto principles – for instance, both share matching five-year trading phases, from 2008 to 2012. Thus the future direction of EU ETS is bound up in United Nations negotiations to determine what follows the first phase of trading under the Kyoto Protocol, which ends in 2012. In the interim, the EU could possibly indicate its continued commitment to the EU ETS by stating that it will take on an emissions reduction target unilaterally (Sugiyama 2005).

It has also been suggested that the European Commission might be able to undertake a number of other measures to increase market certainty. Many of these involve lengthening the period of time over which emissions allocations are guaranteed to operators, thus improving investment certainty.

In the McKinsey review of the EU ETS, 86 per cent of companies said they thought trading periods should be extended, the majority requesting that it should be lengthened to a period of more than 10 years. Likewise, a majority of companies believed that emissions allocations should be decided two, or even three, years in advance of the trading period (McKinsey and Co. 2005). A number of other mechanisms have been suggested that would improve market certainty – for instance, proposals that new installations receive emissions allocations over an extended period. Plans to set indicative long-term targets have also been mooted (Egenhofer 2006).

Balanced against the opportunities of increasing market certainty, there are risks involved in lengthening allocation periods. As levels of political ambition do not yet match the scale of the climate challenge, the EU ETS still requires a large degree of flexibility so that the carbon price is not locked into levels that are too low. Also, the EU ETS is very much built on Kyoto architecture. Both share common features (such as phase lengths), so it may be difficult to unilaterally find a way to fundamentally overhaul the architecture of the European scheme. Furthermore, if trading periods were lengthened and NAPs continued to be calculated using BAU methodologies, it could be very difficult to make accurate growth projections.

Summing up

A number of major obstacles need to be overcome before the EU ETS provides the levels of market certainty that are necessary to stimulate investments in low carbon technologies. Many of these challenges, such as raising carbon prices, can only be overcome in the context of a renewed global commitment to international emissions trading. It also seems likely that complementary schemes to promote investment in renewables, for example, will remain part of the policy landscape for some time to come.

3. Expanding the EU Emissions Trading Scheme to new sectors

Even though the EU ETS covers a substantial proportion of the economy, there are other major sectors that fall outside the scheme – notably, the commercial, household and transport sectors, which together accounted for 34 per cent of EU greenhouse gas emissions in 2003 (see figure 3.1). In some of these sectors, particularly transport, emissions are rising (see figure 3.2). Policies and measures to cut emissions in these sectors must be designed as a matter of urgency.

Figure 3.1: Share of greenhouse gas emissions by gas and sector for the EU25* in 2003

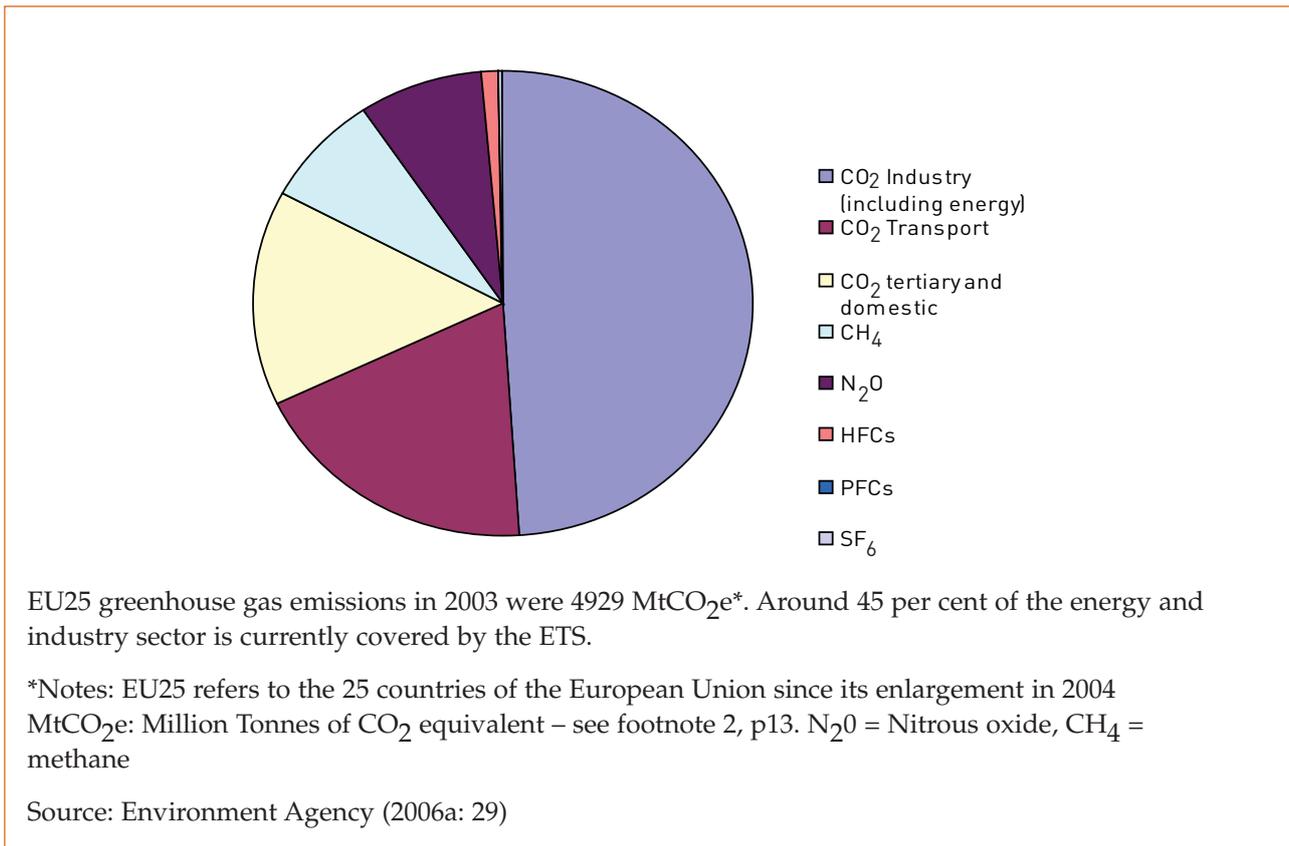
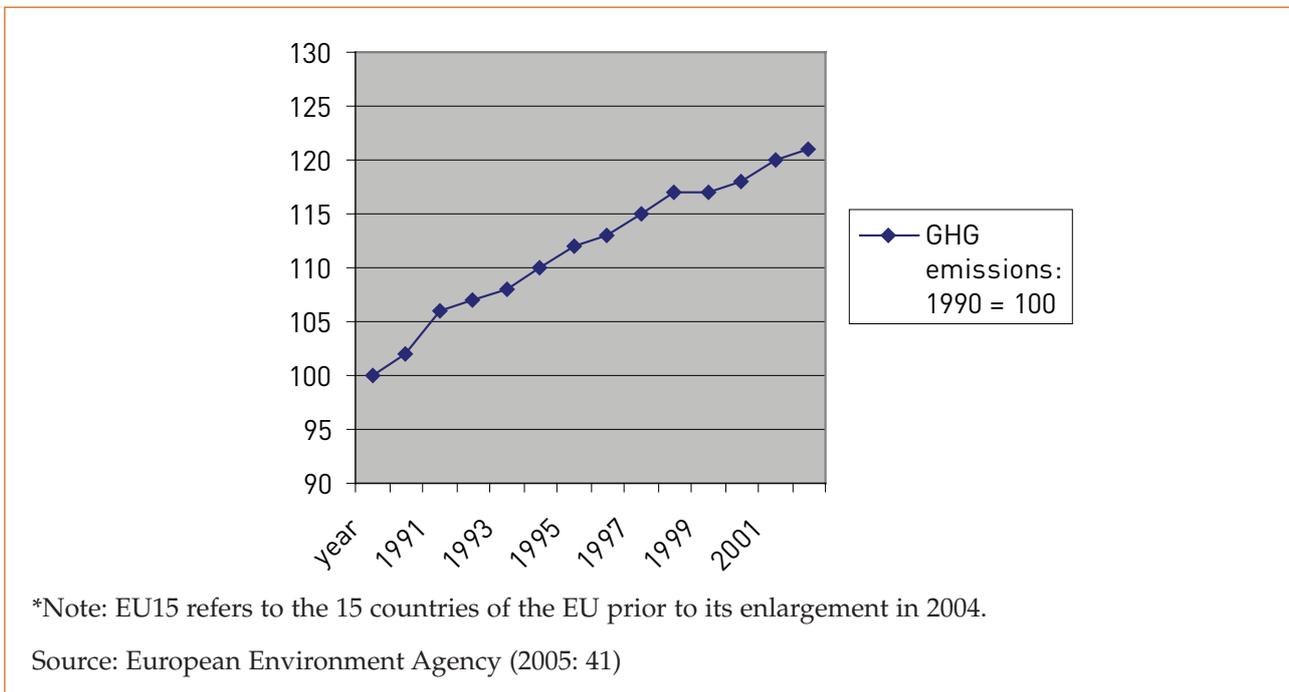


Figure 3.2: EU15* surface transport emission trends



An EU ETS only for energy intensive industries and the power sector?

As it currently stands, the EU ETS has been designed to facilitate efficient carbon abatement by energy-intensive industries and power stations. Trading is undertaken 'downstream' by individual factories and power stations. There are strong arguments in favour of consolidating this arrangement: the EU ETS would continue as a downstream system that allows efficient emissions trading for large point sources of greenhouse gases; also, the sectors included in the trading scheme should be able to abate greenhouse gas emissions relatively cost-effectively.

If the design of the EU ETS remains fundamentally unchanged, then greenhouse gas abatement in sectors outside the trading scheme would be addressed through individual sectoral policies and measures. Indeed, it might be possible to link some of these individual sector schemes to the EU ETS.

Including more energy-intensive industries

In 2003, the energy-intensive industries and power stations sectors included in the EU ETS accounted for around 46 per cent of total CO₂ emissions, both in the UK and in the EU. This included sectors involved in:

- energy activities, such as combustion installations and mineral oil refineries
- the production and processing of ferrous metals
- the mineral industry, including glass and ceramic manufacture
- other activities, such as the production of wood pulp.

Already, Phase II will see some consolidation of the EU ETS. In Phase I, the section of the EU ETS Directive that stated the industries that should participate in trading has been interpreted in a variety of different ways. For instance, the UK took a 'medium' approach to its definition of the combustion installations that were to be included in the trading scheme, allowing some combustion installations to remain outside the scheme. Furthermore, some industries were included in the trading scheme when industries that produced very similar products were not. Following further guidance from the European Commission, many of these anomalies will be addressed in Phase II with, for instance, the UK including additional glass, mineral wool, gypsum, flaring from offshore oil and gas production, petrochemical crackers, integrated steelworks, and carbon black installations (Defra 2006b, European Union 2005).

In addition, a number of studies have envisaged that the EU ETS should be further consolidated beyond 2012, including more gases and activities of the energy-intensive industry sector. These studies suggest that the EU ETS should continue as a downstream system that facilitates efficient trading for large point sources of greenhouse gases, and that new sectors should be able to abate carbon relatively cost-effectively. They also consider whether a sector proposed for inclusion is already subject to additional measures that effectively abate carbon (Environment Agency 2006c).

The process of consolidation could also simplify the scheme and reduce bureaucratic costs, particularly for smaller operators. For instance, 50 per cent of installations currently included in the EU ETS account for only 0.8 per cent of the emissions. There are thus strong arguments in favour of addressing these installations' emissions through a policy mechanism other than the EU ETS (Environment Agency 2006c).

This approach of consolidating the EU ETS has the potential to include some significant new sectors and gases in Phase III. For instance, a cross-Europe project on the future of the EU ETS (Environment Agency 2006b) recommended that additional industrial activities might be included in the trading scheme, including the production of chemicals, aluminium or non-metallic minerals, coal mining, natural gas leaks, refrigeration and air conditioning, semi-conductor manufacture, food and drink, and oil and gas flaring. In 2003, these sectors accounted for 205 million tonnes of carbon dioxide equivalent (MtCO₂e)² – around nine per cent of total EU25 greenhouse gas emissions (see Table 3.1 and 3.2 for details).

2. Note: Carbon dioxide accounts for the majority of greenhouse gases by volume, but is less potent than other greenhouse gases in terms of contribution towards climate change. The relative contributions of greenhouse gases are calculated using the Global Warming Potential index and expressed as carbon dioxide equivalents (CO₂e).

Sectors recommended for inclusion	EU25 current emissions 2003 (MtCO₂e)
Aluminium (Perfluorocarbons – PFCs)	4
Aluminium (CO ₂)	8
Chemicals (N ₂ O)	54
Chemicals (CO ₂)	111
Coal mine methane	29
Total of sectors recommended for inclusion	205

Source: Environment Agency (2006b)

Total of sectors recommended for inclusion	205 MtCO ₂ e
EU25 CO ₂ e allowances – average over three years	2,191 MtCO ₂ e
Percentage increase in coverage of EU ETS as a percentage of current coverage	9%

Source: Environment Agency (2006b)

Policies and measures for sectors outside the traded sector

If the EU ETS continues to be a trading scheme for energy-intensive industry, then carbon savings in the household, commercial and transport sectors will have to be made through additional policies and measures. Some of these policy measures could, potentially, link to the EU ETS.

One measure that has been suggested is to introduce ‘domestic offset projects’, through which projects that reduced emissions in sectors outside the EU ETS would earn credits that could be used to meet EU ETS targets. The allocation of credits would be determined by the emissions reductions that are achieved against a business-as-usual (BAU) baseline. To avoid windfall profits and problems of double counting, double crediting and double regulation, credits would not be given for emissions reductions that were already required or incentivised under EU or national legislation.

There are already a number of voluntary domestic offset schemes, such as Atmosfair in Germany and Climate Care in the UK. The French government has also contracted a study to consider establishing a domestic offset scheme (Environment Agency 2006d). Indeed, the use of domestic offsets had been mooted during the drafting of the Linking Directive. And Article 30 of the EU ETS Directive, concerning the review of the trading scheme, speaks broadly of considering ‘the use of credits from project mechanisms’ (European Union 2003: 30).

However, even though domestic offsets stimulate a low-cost additional emissions abatement effort in non-traded sectors, they do not contribute to additional overall emissions reductions. Indeed, if domestic offsets were incorporated into the EU ETS, it might become more difficult to assess the trading scheme’s contribution towards the EU’s Kyoto targets. In this sense, domestic offsets are similar to the Clean Development Mechanism (CDM) in that both achieve relative emissions reductions against a BAU baseline. Yet CDM projects have a wider political role in stimulating low carbon investment in developing countries, and in encouraging their engagement in international emissions trading. Instead, many emissions trading schemes that use domestic offset mechanisms see its broad purpose as being to cap carbon prices – for example, as in the Regional Greenhouse Gas Initiative (RGGI) in the north-east United States. Here, if the emissions allowance price exceeds particular price levels, the rules for accepting domestic offset project credits is relaxed correspondingly (RGGI 2005).

Another option would be to implement innovative emissions trading schemes in individual sectors. For instance, in the UK, the Carbon Trust has proposed a domestic consumption-based emissions trading

scheme. This organisational-level scheme would include some 5,000 commercial companies and public-sector organisations, covering direct and electricity-related emissions on 50,000 sites. It might cover 15 MtC per year, and by 2020 could save 1.3 MtC every year (Nera and Enviro 2006, Carbon Trust 2005). There are also proposals to develop market-based mechanisms to facilitate trading of greenhouse gas reductions from agriculture and other land-management sectors (Defra 2006a).

Nor should existing policies and measures that can significantly reduce greenhouse gas emissions be forgotten. For example, the UK government used fuel taxation to increase transport prices to above 23 per cent above inflation between January 1998 and July 2000. This is estimated to have helped halt the rise in traffic emissions growth, leading to savings of 1-2.5 MtC per year against BAU projections. It would also be possible for EU-wide measures to improve the fuel economy of vehicles and produce deep CO₂ reductions against BAU projections (Foley and Fergusson 2003). Furthermore, following the 2003 EU Biofuels Directive, individual member states have introduced measures to promote biofuels, which might offer significant carbon reductions of up to 80 per cent (International Energy Agency 2004).

An EU ETS for sectors outside energy-intensive industry and the power sector?

There are strong alternative arguments in support of going beyond consolidating the EU ETS and including new sectors in the EU ETS. While it may be politically very difficult to achieve the deep economy-wide emissions cuts through a fragmented set of individual sectoral policies and measures, taking the decision to include more sectors in the EU ETS may offer definite emissions cuts. If the EU ETS has a tight overall cap and an equitable means of allocating emissions allowances (which may not immediately be possible), then sectors within the EU ETS would achieve net emissions cuts. There is also a rationale for placing a sector such as transport, in which it is costly to cut emissions, in a trading scheme with other sectors with lower marginal abatement costs.

If more sectors are to be included in the EU ETS, then the architecture of the scheme will have to be fundamentally re-orientated. Indeed, there are already proposals to include new sectors in the EU ETS that would radically change the nature of emissions trading. First, the European Commission has proposed to include aviation. This breaks new ground, as aircraft operators (of which there are about 774) would be included in the scheme. Thus installations would be no longer defined as 'stationary units', although the EU ETS would still function as a downstream trading scheme for the end-users of fuels. Also, the aviation industry is unlikely to significantly abate its own carbon emissions because this would be very costly. Instead, in the near term, it would be a net buyer of EU ETS allowances (CE Delft 2005).

Second, the UK Government has written to the European Commission asking that the inclusion of the surface transport sector be considered as part of the review of the EU ETS (Darling *et al* 2006). The inclusion of surface transport would make the EU ETS a very different scheme. Transport could not be immediately included downstream because there are 200 million cars in the EU25 (European Union 2004b). The political barriers to and the administrative costs and complexity of including individual car owners in the ETS would be great.

In the short term, it would be more feasible to include transport 'upstream', by including road transport fuel suppliers in the EU ETS. In the UK, only 20 companies supply over 99 per cent of all road fuel, and for the purpose of fuel duty each litre is already accounted for by HM Revenue and Customs (Department for Transport 2005). Extrapolating to the European level, there are currently about 102 oil refineries in the 25 EU countries, plus two in Norway and two in Switzerland. These are owned by a total of 31 companies, of which 23 are members of the European petroleum industry association EUROPIA.

Towards an upstream approach to emissions trading?

In the longer term, it might be possible to include other sectors in the EU ETS, such as the household sector, through an upstream, fuels-based, carbon cap. Similarly, it might be possible to include shipping through a downstream cap focusing on operators (as per the proposal to include international aviation) or an upstream cap on fuel suppliers.

A number of issues are key to evaluating the efficacy of this approach. It is clear that an upstream approach caps a wide section of the economy. The obligation would fall on fuel suppliers, such as petroleum refineries, oil importers, natural gas pipelines, natural gas processing plants, coal mines, and preparation plants. Furthermore, studies suggest that it is possible to include both upstream and downstream sectors in a single trading scheme, so long as emissions are not double counted. So an upstream approach can be built

relatively readily onto the current downstream design of the EU ETS (Center for Clean Air Policy 1998).

Yet, the extent to which an upstream scheme can influence emissions abatement decisions is a little less certain. For some fuels for which abatement costs are low, there would be an incentive to switch to green fuels. In other cases, this might not be a sufficient incentive, and the sector would be likely to buy in allowances rather than abating carbon, resulting in a slight rise in fuel prices. This too might incentivise behaviour change. For instance, studies have suggested that if aviation were included in the EU ETS, this would lead to air ticket price rises of up to Euro9, which would slightly slow the growth of air travel (CE Delft 2005).

Nevertheless, if including a sector upstream is essentially felt as a consumer price rise, it would be necessary to unpick whether trading were preferable to taxing. Free allowance allocations would also be undesirable if an upstream sector were able to pass through EU ETS costs to consumers. Nor is it immediately certain that an upstream scheme would directly influence the behaviour of midstream and downstream actors (which would include drivers and manufacturers, if road transport were included in the EU ETS), who can also make a range of carbon-saving decisions. Even if fuel prices did rise, these price signals may not be effective, as there will be imperfections in the market (Center for Clean Air Policy 1998).

Nevertheless, concerns that an upstream trading scheme would be ineffective can be overplayed. The current EU ETS is already buttressed by a range of other carbon-abatement policies and measures, because the efficacy of the trading scheme alone is insufficient. For instance, the EU ETS includes power stations at a downstream level, but in the UK, renewable power production is given an additional incentive, through the Renewables Obligation. If surface transport were included, then additional measures – such as tax incentives, and policies to promote green fuels or smarter travel choices – would still be needed to promote low carbon vehicles, fuels and journeys.

A third consideration is that the inclusion of a new sector could alter the EU ETS market. Initially, the inclusion of a large, new sector in the EU ETS might destabilise permit prices as the market makes adjustments. Also, if the included sector had a stringent cap and cheap emissions credits (for example from the CDM) were not available, then prices might rise within the EU ETS, leading to corresponding competitiveness concerns.

Summing up

It seems possible that the European Commission may move away from using the EU ETS solely to facilitate emissions trading for power stations and energy-intensive industries, by including aviation in the scheme. In this case, the possibility of including additional sectors such as shipping and road transport in the EU ETS could come on to the agenda. It seems likely that decisions about each sector would have to be made on a case-by-case basis, bearing in mind the issues discussed above.

4. Linking the EU ETS to other such schemes

Linking the EU ETS to other emissions trading schemes offers the opportunity to seek cost-effective emissions abatement opportunities, and support low carbon sustainable development efforts worldwide.

With these goals in mind, the EU ETS Linking Directive establishes that it will be possible for emissions credits to be acquired through Kyoto's Clean Development Mechanism (CDM) and Joint Implementation (JI). Under these mechanisms, investors in emissions-saving projects abroad can earn Emission Reduction Units (ERU) and Certified Emissions Reductions (CER). These are equivalent to the European Union allowances used in the EU ETS, each worth 1 tonne of carbon dioxide equivalent (CO₂e).

Both the EU ETS Directive and the Linking Directive provide opportunities to link the EU ETS to other emerging national and regional emissions reporting and trading schemes. These include:

- Norwegian and Swiss national emissions trading schemes (both designed very similarly to the EU ETS)
- the Canadian emissions trading scheme
- the Japanese Emissions Trading System (JETS)
- the Regional Greenhouse Gas Initiative (RGGI), involving North East and Mid-Atlantic States of the US
- the Greenhouse Gas Abatement Scheme (GGAS) of New South Wales, Australia
- the California Climate Action Registry. (European Union 2004a)

The strategic goals of linking trading schemes

A number of attractive strategic possibilities can follow from linking together separate trading schemes:

- **Supporting international emissions trading:** Linking trading schemes can support and embed a multilateral approach to dealing with climate change. CDM and JI investments could encourage developing countries to accept emissions caps. Linking with sub-national trading schemes, such as the RGGI scheme in the United States and GGAS scheme in Australia, whose national governments did not ratify the Kyoto Protocol, may build political support for international emissions trading. These sub-national trading schemes also cover large economies – for instance, only eight nations have economies larger than that of California.
- **Increasing economic efficiency:** Successful linking can lead to greater economic efficiency, increasing the availability of cost-effective emissions abatement options. The EU has played a lead role in developing emissions trading, so it would be well positioned as the financial centre of an international market.
- **Increasing investment in low-and middle-income countries:** Linking the EU ETS to Kyoto's flexible mechanisms is seen as a means of mobilising capital to invest in low carbon development in low and middle income countries, whose rapid economic growth is exponentially increasing global greenhouse gas emissions (see Table 4.1).

Challenges in linking to Kyoto's flexible mechanisms

Linking the EU ETS to other trading schemes brings to the fore fundamental questions concerning the *raison d'être* of emissions trading. Some non-governmental organisations argue that because cheap allowances will be available from CDM or JI projects, the objective of achieving emissions reductions within the European Union will be undermined (Climate Action Network Europe 2004, Greenpeace 2003).

The only guidelines that apply to all member states are derived from the Marrakech Accords, which suggest that a maximum of 50 per cent of emissions reductions can be achieved through flexible mechanisms (Langrock and Sterk 2004)³. Early drafts of the EU ETS Directive would have capped the total

3. The formulation proposed by the EU during negotiations stated that each party should acquire and surrender no more emission certificates than the equivalent of 50 per cent of the difference between five times the emissions in one of the years between 1994-2002. The final Marrakech Accords note: 'Use of mechanisms shall be supplemental to domestic action and that domestic action shall thus constitute a significant effort made by each Party [and by implication, each individual EU Member State]... to meet its quantified emission limitation.'

Table 4.1: World carbon dioxide emissions, by region, 1990-2025

Region	Carbon dioxide emissions (million metric tons), by year			
	1990	2001	2010	2025
Industrialised nations	10,462	11,634	12,938	15,643
Eastern Europe/ Former Soviet Union	4,902	3,148	3,397	4,313
Developing regions				
Asia	3,994	6,012	7,647	11,801
Middle East	846	1,299	1,566	2,110
Africa	656	843	971	1,413
Central and South America	703	964	1,194	1,845
Total developing	6,200	9,118	11,379	17,168
Total world	21,563	23,899	27,715	37,124

Source: Energy Information Administration (2006: Chapter 7, Figure 12)

numbers of CERs/ERUs bought into the EU ETS, but the final directive simply stated that ‘each Member State shall publish in its NAP its intended use of ERUs and CERs and the percentage of the allocation to each installation up to which operators are allowed to use ERUs and CERs’ (European Union 2004a, cited in Sterk *et al* 2005: 8). It will be difficult for individual member states to insist on stringent ERU and CER limits if others have bought in cheap credits.

In spite of such concerns, it remains important that CDM projects are opened and extended, in order to finance low carbon sustainable investment in countries such as China and India, whose greenhouse gas emissions are projected to rapidly increase within the coming decades. A recent UK government review has suggested that if 15 per cent of the approximately US\$2 trillion per annum total investment in developing countries was strongly carbon relevant and the extra cost of a major reduction or elimination of carbon in these sectors were 15 per cent of investment, then the extra cost of low carbon would be in the order of US\$45 billion a year. Such sums are far too large to come from developing countries’ own budgets or international aid funds (Stern 2006b).

Thus CDM needs to be developed so that it is able to operate on a far larger scale, and supports sustainable development. To some extent, this may be beginning to occur. In recent years, the volume of CDM credits has grown exponentially, with a significant proportion from renewable energy generation (see Figure 4.1). This is likely to stimulate further private investment, for instance, with World Bank figures suggesting that carbon finance leverages between 1:6 to 1:8 of total project costs (Ellis and Winkler 2004).

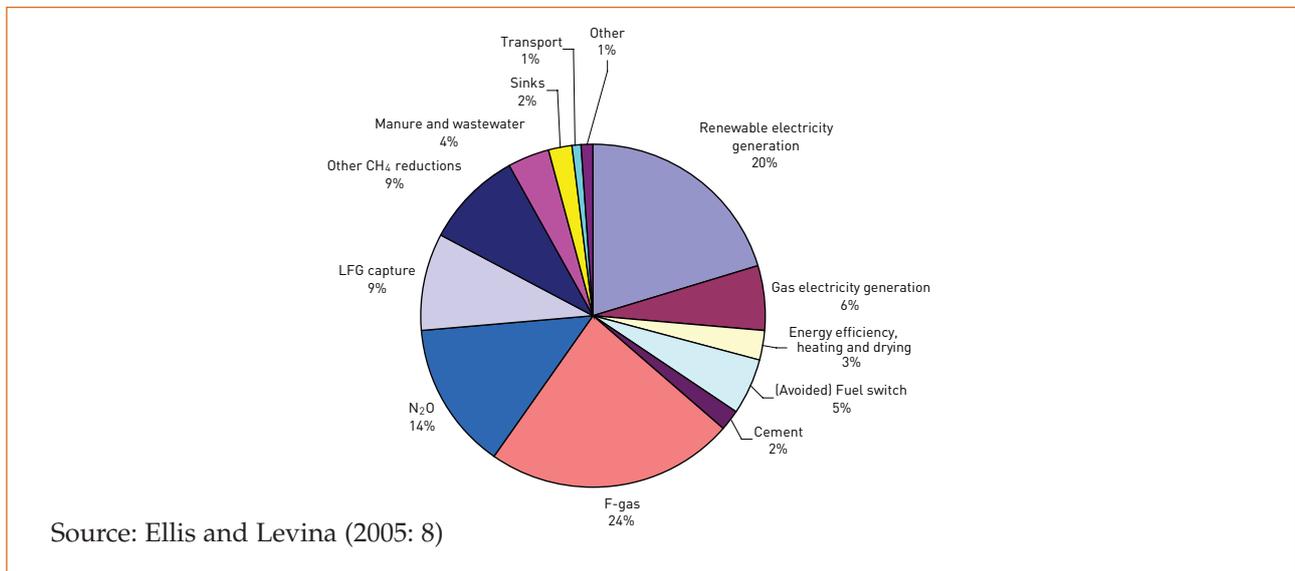
Nevertheless, CDM and JI markets need to be developed further. First, the hold-up in the development of the market by cumbersome bureaucratic processes needs to be addressed. Second, investors in CDM and JI projects also need confidence that the market will continue beyond 2012 so that investments being made now will generate returns beyond the next six years (Hamilton and Kenber 2006).

The third point is that CDM and JI might not yet best support sustainable development in low- and middle-income countries. They are currently set up to reward isolated, individual projects that do not always have a transformational effect and produce limited numbers of credits. Furthermore, the majority of CDM projects abate non-CO₂ greenhouse gases, such projects are often less expensive. There is equal environmental value in abating any greenhouse gas; however, the goal of low carbon, sustainable development requires the transformation of fossil fuel, CO₂ emitting industries and power producers. It is somewhat incongruous that the EU ETS has been designed for installations that emit CO₂, yet it is possible for operators to meet EU ETS targets in part by buying in project credits that cover non-CO₂ emissions.

Kyoto mechanisms have only just been set up and it is too soon to advocate that they are fundamentally overhauled. Also, it is possible that CDM and JI will develop more low carbon power projects in future years as the market matures. Even so, the function and purpose of the Kyoto mechanisms should be

reviewed in detail. If they do not deliver on sustainable development goals, then the mechanisms could be adjusted in the future. One approach would be to develop ‘sectoral-CDM projects’. These would award credits for emissions reductions made across a sector at a regional or national level – for example, electricity generation or transport (Figueres 2006, Heller and Shukla 2003).⁴ The European Commission and/or individual member states could also consider ‘qualitative limits’ on project credits, stipulating that only CO₂ credits could be bought by EU ETS operators. Indeed, the UK government considered this issue during consultations on the Linking Directive in 2005 (Defra 2005: 18).

Figure 4.1: Percentage of annual credits, by project type, November 2005



The European Union has a significant interest in the development of CDM and JI, even if these mechanisms are administered through United Nations Framework Convention on Climate Change (UNFCCC) institutions. First, the EU ETS trades large volumes of Emissions Reduction Units (ERUs) and Certified Emissions Reductions (CERs), and operators have an interest in developing large-scale sustainable development projects that could become a large source of low cost emissions credits.

The EU has stated its interest in advancing low carbon sustainable development. The Linking Directive states that the purpose of CDM/JI is to ‘invest in the development and transfer of advanced environmentally sound technologies and know how [...] in a manner that supports sustainable development strategies’ (European Union 2004a, paragraphs 3 and 13). Thus, there have already been European Union-level decisions to promote high quality CDM projects: nuclear projects are forbidden, as are ‘land use, land use change and forestry’ (LULUCF) projects.

Furthermore, the large scale development of CDM projects might also encourage developing countries to accept emissions caps in future rounds of UNFCCC negotiations. Yet, even if the use of Kyoto emissions credits is expanded, CDM investments alone may not be able to fund low carbon sustainable growth in all developing countries. CDM projects have an uneven geographic distribution (see Figures 4.2 and 4.3). In addition, from 1980 to 2002, the total flow of aid was less than foreign direct investment, but it still remained an important source of investment in the poorest countries. It is also significant to note that during that period, 20 per cent of aid went to transport and energy infrastructure (Ellis and Winkler 2004).

In view of the above points, CDM investment flows will fit into a broader global energy investment framework that includes public and private finance mechanisms alike (Brown 2006). As the debate moves forward, this is an issue that could be reviewed by the European Commission.

4. For a slightly more cautious view of making adjustments to CDM mechanisms see Hamilton and Kenber (2006)

Figure 4.2: Geographic split of expected annual CDM credits (in total CDM portfolio), November 2005

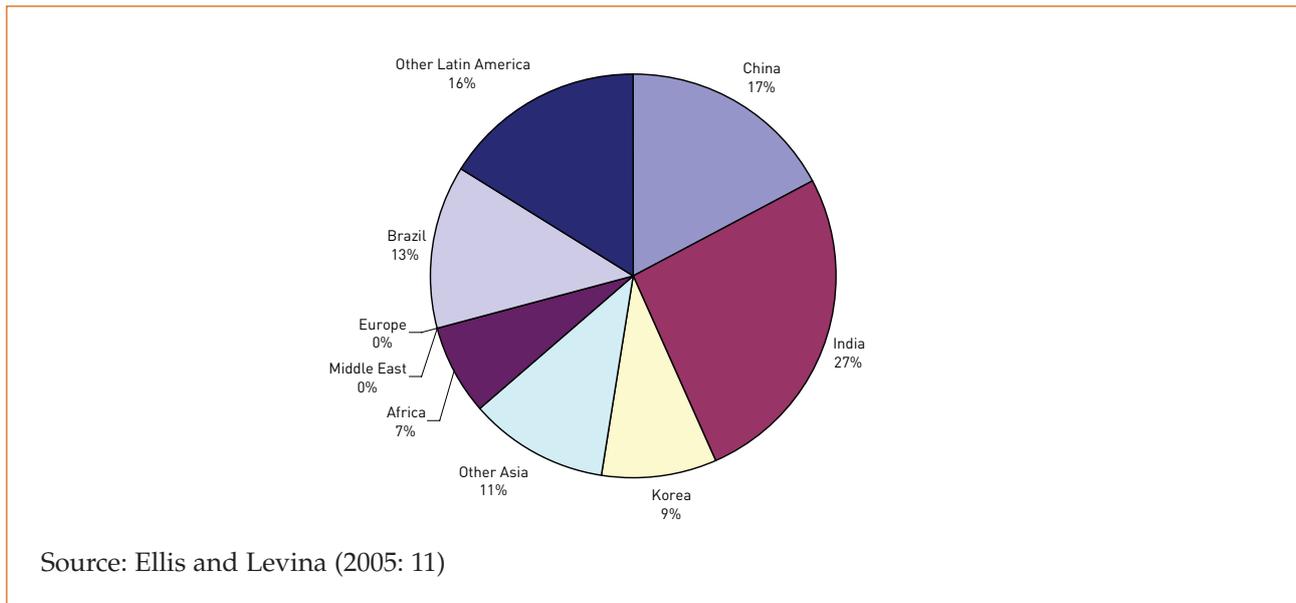
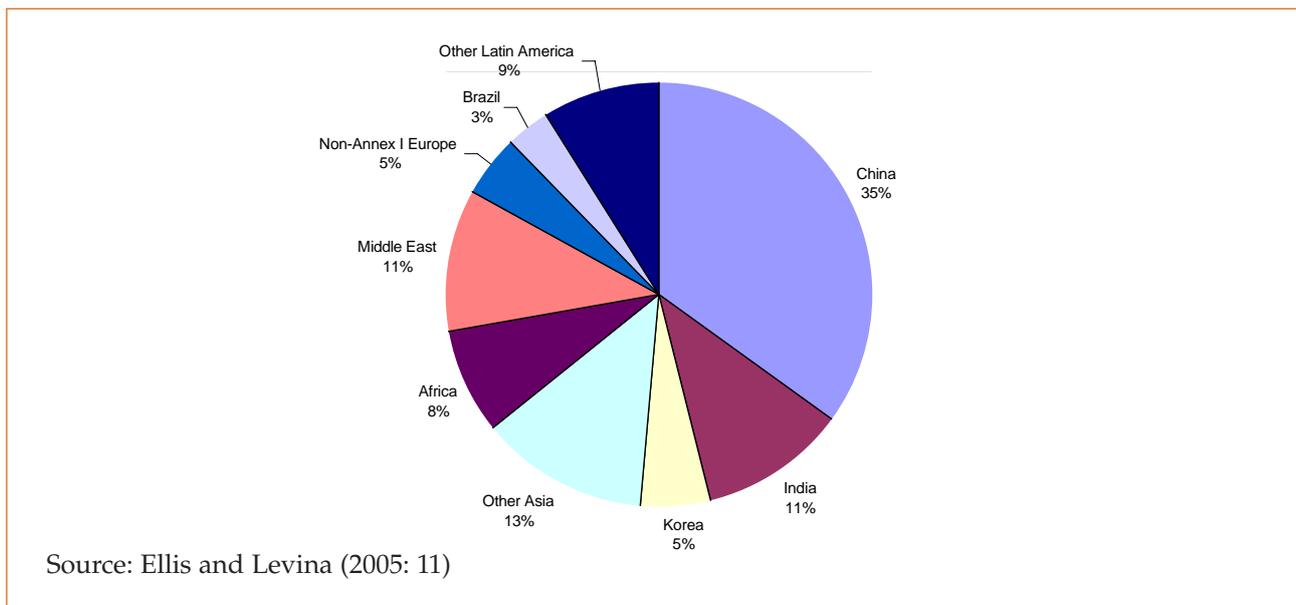


Figure 4.3: Non-Annex I CO₂ emissions, 2005



Challenges in linking to other national and sub-national trading schemes

The prospect of linking to other national and sub-national trading schemes has been a long-held ambition of EU ETS policymakers. Article 25 of the original directive states: ‘Agreements should be concluded with third countries listed in Annex B [...] to provide for the mutual recognition of allowances between the Community scheme and other greenhouse gas emissions trading systems’ (European Union 2003: 25).

The Regional Greenhouse Gas Initiative (RGGI) and Greenhouse Gas Abatement Scheme (GGAS) trading schemes have also expressed an interest in linking to the EU ETS, noting: ‘While mandatory schemes in the US and Australia would not be able to sell allowances into the EU Scheme, until those countries ratify [the Kyoto Protocol], the [EU ETS] Linking Directive introduces the potential one-way flow of allowances from the EU ETS to US and Australian systems’ (Greenhouse Gas Coalition 2004: 1).

The key issue – as with debates around CDM and JI trading – is how linking relates to the strategic purposes of the EU ETS. The Kyoto Protocol and Marrakech Accords can provide some common foundations that would allow the linking of trading schemes, notably:

- mutually agreed national targets and timeframes

-
- international units of exchange
 - common requirements for eligibility, a compliance framework and common 'monitoring, recording verification' (MRV) standards. (Meadows 2004)

But the Kyoto Protocol and Marrakech Accords focus on the emissions trading undertaken by national parties – they are silent on domestic trading and on how trading regimes manage the transactions of individual operators. As a result, further agreements are needed (Macpherson 2004).

Most believe these further agreements will be bilateral treaties made between individual trading systems. They argue that bilateral linking agreements between trading schemes will not be mutually exclusive. For example, if system A is linked to system B, system B should also be able to trade with system C, even if A does not have a linking agreement with C. The process of linking is likely to lead towards a single price of carbon across all linked schemes.

However, there are a number of hurdles to overcome to ensure that a 'bottom-up' approach to linking together trading schemes is able to achieve EU ETS strategic goals:

- The environmental integrity of the EU ETS would be watered down if, for example, the EU ETS was linked to trading scheme B, and B accepted LULUCF and/or nuclear credits, then these would leak into the EU ETS.
- Economic modelling suggests that linking the EU ETS to another trading scheme that had relative targets would lead to more emissions being emitted. Thus, it might be problematic to link the EU ETS, for instance, to the Canadian emissions trading scheme, which has energy intensity targets.
- It would be politically difficult to link trading schemes that have different carbon prices, even if both schemes have absolute emissions caps. A simple example of the political difficulties that might arise could see trading scheme A, with a higher carbon price, becoming a net buyer of lower price permits from scheme B. Thus A would subsidise B's carbon abatement efforts (Blyth and Bosi 2004, Pershing 2004).

Summing up

Linking the EU ETS to other emissions trading schemes and developing a single global carbon market could finance low carbon development in the middle-income countries where greenhouse gas emissions are rapidly growing, and also support the cause of international emissions trading. Yet the imperative of achieving emissions reductions within the European Union must be balanced against this opportunity. Furthermore, the task of knitting together different domestic trading schemes to create a global carbon market will be a complex task.

5. Conclusions

This discussion paper sets out some of the key issues that will be faced if the European Commission's review of the EU ETS takes a long, strategic view of European emissions trading. These issues will be discussed in greater depth in a final report, likely to be published towards the end of 2006.

Ensuring emissions reductions

By far the most pressing issue that the European Commission faces is reforming the way in which National Allocation Plans are set. Currently, emissions allowances are allocated by a process that is tangled, opaque and decentralised, and member states are reluctant to reduce emissions beyond the targets of their neighbours. Certainly in the immediate term, reform efforts are likely to be directed towards moving towards a NAP-setting process that is simpler, more transparent, co-ordinated and decentralised, in which the European Commission sets a level playing field for member states.

Ultimately, it might be possible to move towards a centralised, EU-wide process of allocation that would drive down greenhouse gas emissions. However, although such a scheme would be most economically efficient, it would require the European Commission to take power away from member states – a difficult process. Furthermore, if emissions reductions within the EU ETS are to be achieved, carbon prices will have to be raised – a development that may only be possible if there were a renewed global commitment towards international emissions trading.

Expanding the EU Emissions Trading Scheme

The European Union faces the choice of deciding how many sectors to include within the EU ETS. Currently, the directive facilitates efficient downstream trading for power stations and energy-intensive industries. However, there are also proposals to include aviation in the EU ETS, and the review is also likely to consider including surface transport. This would fundamentally change the nature of emissions trading, and would require the European Commission to further consider the economic and environmental implications of including new sectors, which are likely to be net buyers of trading permits.

Establishing a global carbon market

Linking the EU ETS to other trading schemes would offer a number of strategic prizes. These include:

- financing the sustainable development of low- and mid-income countries – particularly those whose rapid growth could drastically worsen the climate balance
- encouraging large economic regions and states from among the countries that refused to ratify the Kyoto Protocol to develop trading schemes
- developing a global emissions market that allows efficient carbon abatement, with the EU ETS as the financial hub.

Nevertheless, there are significant challenges. The imperative of achieving emissions reductions within the European Union needs to be balanced against the opportunity to link the EU ETS to other trading schemes. Furthermore, creating a global carbon market out of a variety of domestic trading schemes is a complex task.

Quite rightly, a significant focus of the EU ETS review will be to consolidate the trading scheme as it stands. Where it is practically possible, the broader, strategic purposes of emissions trading should also be considered. In the longer term, these will be the key issues that determine the future of emissions trading.

Appendix 1: How does the EU ETS work?

The EU ETS currently covers carbon dioxide (CO₂) emissions from power stations and energy-intensive industries, such as steel, cement, paper and oil refining, throughout the EU. The first phase of the scheme ('Phase I') runs from 2005 to 2007 and the second from 2008 to 2012 ('Phase II').

Phase II of the EU ETS coincides with the first commitment period of the Kyoto Protocol, the international emissions reduction and trading treaty negotiated under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC). Indeed, the purpose of the EU ETS is to contribute towards meeting the emissions reductions targets agreed under the Kyoto Protocol.

Each member state in the EU ETS devises a National Allocation Plan (NAP) for each phase. Each state's NAP specifies the total emissions that are permitted for each phase, and sets out how allowances are to be allocated to the installations (such as power stations and factories) that are included in the scheme. In Phase I, governments have the discretion to 'auction' up to five per cent of their allowances. Meanwhile, the other 95 per cent must be allocated free of charge. In Phase II, they can auction up to 10 per cent.

Each installation is allocated a quota of allowances, each of which permits the installation to emit 1 tonne of carbon dioxide (tCO₂). Allowances can be 'traded' between installations (and intermediaries) across the EU. This means that if an installation produces more emissions than its quota, it must buy additional allowances from installations emitting less than their quota. The penalty for producing more emissions than allowances is Euro40 per allowance in the first phase, and Euro100 per allowance in the second phase. The excess emissions must also be covered by allowances surrendered by the installation in the following year, so that the environmental integrity of the scheme is not compromised.

Installations are also allowed to buy emissions credits through Kyoto's Clean Development Mechanism (CDM) and Joint Implementation (JI), in which investments in emissions-saving projects abroad, in developing countries and industrialised countries respectively, earn 'emissions reduction units' (ERUs) or 'certified emissions reductions' (CERs), which are equivalent to allowances.

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