National Audit Office

A REVIEW BY THE
NATIONAL AUDIT OFFICE

MARCH 2009

European Union Emissions Trading Scheme

Our vision is to help the nation spend wisely.

We promote the highest standards in financial management and reporting, the proper conduct of public business and beneficial change in the provision of public services.

The National Audit Office scrutinises public spending on behalf of Parliament. The Comptroller and Auditor General, Tim Burr, is an Officer of the House of Commons. He is the head of the National Audit Office which employs some 850 staff. He and the National Audit Office are totally independent of Government. He certifies the accounts of all Government departments and a wide range of other public sector bodies; and he has statutory authority to report to Parliament on the economy, efficiency and effectiveness with which departments and other bodies have used their resources. Our work leads to savings and other efficiency gains worth many millions of pounds; at least £9 for every £1 spent running the Office.

This report has been printed on Consort 155

Design & Production by
NAO Marketing & Communications Team
DP Ref: 008910 | Printed by SLS Print


NAO
National Audit Office

National Audit Office

European Union Emissions Trading Scheme

A REVIEW BY THE NATIONAL AUDIT OFFICE

MARCH 2009

This briefing by the National Audit Office has been carried out in response to a request from the Environmental Audit Committee to provide an update on the European Union Emissions Trading Scheme covering developments since the Committee last reported on this topic in 2007

Contents

This review was conducted by Nia Davies, Eric Lewis and Nicola Thomas under the direction of Jill Goldsmith.

For further information about the National Audit Office please contact:

National Audit Office
Press Office
157-197 Buckingham Palace Road
Victoria
London
SW1W 9SP

Tel: 020 7798 7400
Email: enquiries@nao.gsi.gov.uk

Key Findings

1 The European Union Emissions Trading Scheme (EU ETS or 'the Scheme') aims to reduce emissions of greenhouse gases from industrial sources across the European Union (EU). It provides for carbon dioxide (CO_2) emissions from large scale industry to be capped, by requiring companies to submit allowances sufficient to cover their verified emissions and setting a fixed total for the number of allowances issued. Companies can buy allowances from other operators or sell surplus allowances as they require. They may also use project credits to cover their emissions – these generally represent emissions reductions achieved in developing countries, as allowed under the Kyoto Protocol. The Scheme operates in distinct compliance periods. Phase I operated from 1 January 2005 to 31 December 2007. Phase II commenced on 1 January 2008 and will end on 31 December 2012. Phase III will operate from 2013 to 2020.

2 This briefing by the National Audit Office has been carried out in response to a request from the Environmental Audit Committee ('the Committee') to provide an update on the European Union Emissions Trading Scheme covering developments since the Committee last reported on this topic in 2007, as summarised in Appendix 1. We report on the operation and performance of the EU ETS incorporating the full emissions data from Phase I. We also report the outcome of the recent negotiations on Phase III of the Scheme in order to provide the Committee with an overview of how far the Committee's concerns have been addressed.

Key Findings

On the structure and operation of the Scheme

3 Phase I was based on individual Member State caps which in total amounted to an EU-wide cap of 6,542 $MtCO_2$. Verified emissions across the three years were significantly below this (6,093 $MtCO_2$), and only four Member States exceeded their allocations: Italy, Spain, Slovenia, and the UK. The Commission reduced national allocations to tighten the Phase II cap, but the use of project credits may weaken the cap's impact. If all of the scope for using project credits were taken up by operators, Phase II would not require an absolute reduction in total EU emissions compared to Phase I; while compared to 2005 verified emissions, it would result in an increase in emissions of seven per cent. Recent changes to the EU ETS have meant that any unused portion of the limit for project credits set by individual Member States may be carried over into Phase III.

4 In the UK, most sectors were allocated allowances in line with projected growth in both Phase I and Phase II. The total UK Phase I allocation of 245 $MtCO_2$ a year amounted to an eight per cent reduction below business as usual forecasts. The total UK Phase II allocation of 246 $MtCO_2$ a year represented an absolute reduction in emissions compared to the Phase I cap, because there was an increase in the number of installations participating in the Scheme in Phase II. It also represented an 11 per cent reduction against business as usual. The government determined that the power sector should be the only sector to be allocated allowances below their business as usual forecasts, making it responsible for delivering all the 'effort' involved in reducing emissions, while other sectors received allocations in line with their business as usual projections. However, UK installations can buy allowances from participants in other EU Member States and may also utilise up to 91 $MtCO_2$ of project credits over the five year period, which represents 60 per cent of the emission reduction effort required in Phase II.

5 In Phase I, the UK government used historic emissions levels for allocating all allowances, except for those available from the New Entrant Reserve. For Phase II, the government used benchmarking to allocate allowances to the power sector, but continued to use historic emissions for all other sectors. The power sector benchmarking was based on the input fuel and load factors of installations. It resulted in coal-fired generators receiving more allowances for the same quantity of electricity produced than gas-fired generators, although allocations to high emitting generation technologies such as coal were lower than if historic emissions had been used. The alternative approach of basing benchmarks on output indicators would give fewer allowances to higher emitting generating technologies such as coal.

6 In Phases I and II the UK government set aside a percentage of allowances to form a New Entrant Reserve to allow free allocations to new entrants. Allowances withdrawn from sites which have closed were added into the New Entrant Reserve in Phase I and added to the sum for auctioning in Phase II. Allocating free allowances from the Reserve and taking them from closing sites removes the distortionary effect of free allocation benefiting existing installations over new entrants but does not maximise the incentives for industry to reduce their emissions. Providing free allocations for new entrants supports the expansion of industry and its emissions although using benchmarking provides some incentive to use the most efficient technology. Withdrawing future allocations from closed installations may provide an incentive to companies to keep a heavily polluting installation open for longer in order to retain the associated allowances. However, had the government allowed operators to retain allowances following an installation's closure, they would have been able to generate revenue without any economic activity.

7 Under the EU ETS Directive Member States were permitted to auction up to five per cent of their total national allocation in Phase I, increasing to ten per cent in Phase II. In common with most other Member States the UK government did not auction any allowances in Phase I. In Phase II the government has decided to auction seven per cent of the total UK cap (87 million allowances) and any surplus from the New Entrant Reserve, as long as the combined total does not exceed ten per cent of the UK Phase II cap – the maximum allowed by EU legislation. Germany is the only Member State other than the UK which is planning to auction a large quantity of allowances in Phase II.

8 Auctions in the UK will allow both 'competitive' and 'non-competitive' bidding so that they are accessible to all EU ETS participants. Competitive bidding, used in the first auction in Phase II carried out in November 2008, required companies to bid for a multiple of 1,000 allowances via an intermediary known as a Primary Participant. The auction was over four times oversubscribed with the government receiving more than 16.5 million bids, and the allowances were sold for €64.4 million (£54.4 million). The auction revenues are paid directly into the Consolidated Fund. Future auctions will also allow 'non-competitive' bidding which is expected to be suitable for smaller companies which are buying allowances for compliance purposes only. Although the first UK auction in Phase II was oversubscribed, the economic situation has changed significantly. As most companies have received allocations broadly in line with their business as usual emission projections for the period 2008-2012, any decrease in production will lead to emissions being lower than the allocations of allowances they received. In these circumstances, there may be less demand for purchasing allowances through auctions.

9 Rigorous monitoring, reporting and verification requirements are essential for sustaining confidence in the EU ETS, and robust procedures are in place. Companies responding to our October 2008 survey said they had average annual costs of monitoring and reporting of £26,000 and average annual verification costs of £9,000. They criticised the cost of the Scheme but only ten per cent of respondents wanted to change existing arrangements as this would create additional financial costs. To date there have been very few instances of UK companies failing to comply with the rules of the Scheme. In the UK in Phase I there were only four cases of companies failing to surrender sufficient allowances to account for verified emissions. Compliance risks may be greater for the future given the economic downturn affecting the UK economy.

On the impact of EU ETS to date

10 There are inherent difficulties in assessing the impact of the EU ETS. As an international trading scheme, the Scheme's effectiveness can only be properly assessed at an EU level. Assessing the impact of the Scheme by reference to the overall cap set and outturn performance is insufficient, as it fails to take account of the range of economic factors and other policy instruments which may affect companies' operational and investment decisions and resulting performance. And, if emissions are at or below the cap, this cannot necessarily be taken as an indication of the success of the scheme because allowances might have been over-allocated in the first place. Phase I and II allocations were determined by reference to business as usual emissions forecasts, and these forecasts can provide an alternative benchmark against which to judge the effectiveness of the EU ETS – though they can often prove inaccurate and misleading for various reasons. Taken together these measures give some indication of performance, and this review has also sought less quantifiable benefits the scheme may have had, in terms of raising awareness within industry of the importance of reducing carbon emissions and of carbon pricing as a means of doing so.

11 Verified EU emissions across the three years of Phase I were 6,093 $MtCO_2$, significantly below the EU-wide cap of 6,542 $MtCO_2$. Most experts consider this outcome was due to the over-allocation of allowances to ETS sectors, rather than to the impact of the scheme itself. In each of the three Phase I years, total emissions from installations operating in the UK have been higher than the national cap, and UK operators have therefore had to purchase allowances issued by other Member States to comply with the Scheme. The power sector accounts for 71 per cent of UK emissions covered by the Scheme, and the introduction of the EU ETS in 2005 may have initially encouraged it to switch back to gas to some extent. The sector contributed to rising emissions in 2006 because of the subsequent increased use of coal for generation, though emissions fell again in 2007. In total, verified Phase I emissions in the UK exceeded allocations by 13 per cent and were slightly in excess of the business as usual forecast. This suggests that Phase I may not have resulted in any reduction in emissions from UK installations participating in the EU ETS.

12 Although total verified emissions from all non-power sectors were nearly 15 per cent below allocations, and every sector was equal to or below its allocation, our analysis of site-level data showed that up to 40 per cent of UK sites in non-power sectors had emissions that were higher than their allocation. This may show that even though as a whole there were sufficient allowances, at the installation level the EU ETS cap may have had some effect on company behaviour. Respondents to our October 2008 industry survey, however, indicated that falling output was the most common cause of emissions being lower than their allocations.

13 Phase II of the EU ETS may also not result in significant emission reductions. UK figures for verified emissions in 2008 will not become available until spring 2009. Forty per cent of companies responding to our October 2008 industry survey believed their emissions would be higher than their allocation. This was an increase on the 34 per cent of companies who reported higher emissions than their Phase I allocation, and provided some limited evidence that companies viewed Phase II as more challenging. However, the survey was carried out in October 2008 before the full extent of the economic downturn had been appreciated, and the impact of the recession may dwarf any reductions which the EU ETS would otherwise have achieved. The decision to allow Phase II allowances and project credits to be carried forward to Phase III may help to prevent a repetition of the collapse in the market for allowances like that experienced in Phase I. But if a substantial number of allowances are carried forward, it may have a significant impact on the environmental effectiveness of the Phase III cap.

14 Our October 2008 industry survey confirmed that the Scheme had achieved a functioning carbon market and may have influenced behaviour: 82 per cent of respondents had traded carbon allowances and overall 40 per cent considered the Scheme had had some or significant impact. While 34 per cent of respondents believed the EU ETS had not had any impact on their company's emissions, 64 per cent considered it had had some impact – including nine per cent who considered the impact significant. Companies also reported that trading has had some impact on board-level consideration of carbon abatement. Around 32 per cent of companies responded that the one of the key benefits of the EU ETS was that it had increased the importance of CO_2 emissions and energy efficiency at the board-level. This was particularly the case in the power sector; whereas in other sectors the EU ETS was seen as less important and there were other factors that had a greater impact on a company's emissions and energy consumption, such as fuel price. Respondents to our survey within all six sectors identified technological investments that were partly incentivised by the EU ETS, though these tended to be least-cost abatement options which were relatively easy to implement. However, the large rise in energy prices from 2004 to 2008 has had a major impact on the economy, and in that context it is difficult to assess to what extent the EU ETS has influenced such investments.

15 The establishment of predictable carbon prices is fundamental to the effective operation of the EU ETS. The Phase I allowance price developed robustly in the first 16 months of the EU ETS to a peak of €29.75 in April 2006. However it then crashed, and following a partial recovery fell to nearly zero. Phase II allowances constitute a distinct market, and future trading in them began in mid-2005. For some time, Phase II allowances traded at a price of €25-28 per tonne CO_2. But from a high in July 2008 the price has fallen to around €11 per tonne CO_2 in March 2009, reflecting the current economic downturn, concerns about the weakness of the cap, and the ready availability of allowances. It is unclear what further impact the current economic downturn will have on EU ETS allowance prices. Allowing Phase II allowances to be carried forward to Phase III may prevent further falls, and there are some grounds for thinking that carbon prices are now being underpinned by a Chinese tax on project credits, but there is a continuing failure to develop medium and longer term secondary markets in allowances. The current allowance price is considerably below the levels anticipated for Phase II, and significantly lower than that required to incentivise major investments in low carbon technologies.

16 Our October 2008 industry survey generated mixed responses on the impact of the Scheme on international competitiveness. Most of the sectors suggested that the Scheme had had little impact. By contrast to concerns about competitiveness, there have also been suggestions that the allocation of free allowances has resulted in increased prices and windfall profits within some sectors. In 2007 the Committee identified the potential for power generators to make windfall profits as a result of the EU ETS. It is difficult to obtain robust evidence on the extent to which costs have actually been passed through because much of the data is commercially sensitive.

17 The EU ETS is the government's main policy instrument for reducing emissions in the industrial sector. Our October 2008 industry survey and interviews highlighted some complex interactions between the EU ETS and the range of other environmental policies in place, such as the Large Combustion Plant Directive and the Integrated Pollution Prevention and Control Directive. For example, companies had to deal with the complexity of different monitoring arrangements for the different Directives. Also, the use of innovative materials to reduce the weight of vehicles and improve their emissions can itself result in an increase in emissions during the manufacturing process. But our survey also confirmed a widespread recognition in industry that there were synergies between the Scheme and other policy instruments affecting them.

On the development of Phase III

18 The development of proposals for Phase III began in November 2006, and after extensive discussion and consultation the revised ETS Directive was ratified by the European Parliament on 17 December 2008. The European Union sought early agreement on Phase III to support its negotiating position leading up to the meeting of the Conference of the Parties to the UN Framework Convention on Climate Change in Copenhagen in late 2009, at which it is hoped that a post-2012 agreement for emission reductions can be reached, as a successor to the Kyoto Protocol. Some important aspects of the Phase III Directive could change depending on the outcome of these international negotiations.

19 The Directive addresses weaknesses in previous phases of the Scheme and radically alters it in certain respects. In particular, Member States will no longer be required to submit National Allocation Plans as the Directive sets out a centralised approach for determining the overall EU cap and its future trajectory. The Directive also allows for far greater use of auctioning and for greater harmonisation in many other aspects of the Scheme. A related Directive also allows for aviation to be included but on a partially ring-fenced basis.[1] However, there remains continuing uncertainty over various aspects of the Scheme and detailed implementation measures will be agreed through comitology procedures.

1 Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community.

20 In 2013, the EU has stated that at least 50 per cent of allowances will be auctioned, and by 2020 all allowances for the power sector across Europe together with a substantial percentage of allowances for some other sectors will be allocated in this way. Industry expressed concerns to us about the limited experience of auctioning prior to Phase III and the potential effects on competitiveness. Moreover, the Directive does not specify which sectors may receive free allocations due to concerns about competitiveness, and there is still some uncertainty about which sectors may be exempted in this way. Industry also highlighted the difficulty of developing benchmarks for the allocation of free allowances for many sectors given the heterogeneity of the companies they contained. The continued use of free allocations continues to represent a financial subsidy to certain sectors and Member States, though it only reduces the Scheme's efficiency and not its environmental effectiveness.

21 The cap set for 2020 is based on the requirement for the EU ETS to achieve a 21 per cent reduction in emissions by 2020 against 2005 verified emissions, and amounts to 1,720 $MtCO_2$. However, the decision to allow unlimited banking of allowances and project credits between Phases II and III has weakened this cap. Up to 1,600 $MtCO_2$ of project credits may now be used across both Phases. Maximum use would mean that the average reduction against the baseline across Phases II and III would only amount to seven per cent. The reduction in EU emissions by 2020 is likely to be significantly higher than this (up to a maximum of over 20 per cent), though in practice it will depend on the extent to which project credits are used and on the distribution in their use. The effectiveness of the cap in reducing emissions could be further weakened if the impact of the current economic downturn resulted in significant numbers of ordinary allowances being carried forward into Phase III. The extensive use of project credits in Phase III is likely to reduce the price of EU allowances and consequently the impact of the price on investment decisions, though this could be affected by the outcome of international negotiations on the future of the Clean Development Mechanism.

22 Aviation will be included in the EU ETS from 2012 on the basis of including all emissions relating to all international flights into and out of the EU, irrespective of the nationality of the operator. The cap for the aviation sector will be set in 2012 at 97 per cent of the level of average emissions in 2004-06, and, from 2013 onwards, at 95 per cent of the 2004-06 baseline. Most allowances will initially be issued free of charge, though this will be subject to review from 2014. Aviation operators can also offset their emissions up to a limit of 15 per cent of their verified emissions in 2012 through the use of project credits, reducing to 1.5 per cent of their verified emissions from 2013 to 2020. The forecast expansion of the sector means that it is unlikely that there would be any net flow of allowances from aviation to other sectors. In any case, for reasons of compliance with the Kyoto Protocol, the aviation sector will be partially ring-fenced and a special category of allowances issued to it which cannot be used by other sectors for compliance purposes. Non-aviation allowances can be used by aviation operators for compliance, and – to the extent that aviation operators cannot reduce their emissions – this is likely to increase demand for ordinary allowances. This could impact on their price and on incentives to the power sector and industry to invest in emissions abatement and low carbon technologies.

23 If a comprehensive international agreement is reached in Copenhagen, the overall cap for the EU ETS will be increased to deliver a 30 per cent reduction by 2020. The EU is also keen to promote an international carbon market and link the EU ETS to other trading schemes. Industry expressed concerns about the extent of uncertainty associated with these possible developments and the impact they would have on the EU ETS. There is also considerable uncertainty arising from the challenging EU target for increasing renewable energy to account for 20 per cent of all energy consumption by 2020, and the likelihood that additional policy instruments will be needed to meet this target.

24 The range of uncertainties associated with Phase III means that no medium or long-term forward price for allowances has been established. In the absence of such a market, the EU ETS is unlikely to be demonstrably achieving its objectives. It is possible that a stable Phase III allowance price might become established after various aspects of the Scheme's implementation have been clarified and international negotiations have been completed. Even then, however, further uncertainties relating to the review of aviation in 2014, the possible inclusion of other sectors (such as shipping), and the possibility of linking to other non-EU schemes remain. The absence of long term carbon price signals has a particular effect on some key sectors (such as power) because of the long asset lives associated with new investments.

Part One

Background of the EU Emissions Trading Scheme

Introduction

1.1 This briefing by the National Audit Office has been carried out in response to a request from the Environmental Audit Committee ('the Committee') to provide an update on the European Union Emissions Trading Scheme covering developments since the Committee last reported on this topic in 2007.

1.2 The European Union Emissions Trading Scheme (EU ETS or 'the Scheme') aims to reduce emissions of greenhouse gases from industrial sources across the European Union (EU). In Phases I and II only emissions of carbon dioxide (CO_2) are included in the Scheme and it will expand to include more gases in Phase III. It is the largest emissions trading scheme in the world covering an unprecedented number of countries and industrial activities, and it is the only example of an international cap and trade scheme (**Figure 1**). It covers some 11,000 industrial sites in the EU and more than 45 per cent of EU emissions of CO_2. At present around 900 sites in the UK are participating in the Scheme, representing 50 per cent of UK CO_2 emissions[2]; and the Scheme is a cornerstone of the UK government's response to tackling climate change.[3]

1.3 In its 2007 report, the Committee explored the performance of the Scheme in the first two years of operation and the impact of decisions taken by the government and the European Commission ('the Commission'). The Committee praised the success of the Commission and Member States in establishing a functioning trading market in a short period of time. However, on the basis of performance data from 2005 (the first year of operation of the Scheme), it identified several areas of concern for the future of the Scheme and its ability to deliver real reductions in CO_2 emissions from UK businesses:

- the national caps across the EU were too unambitious, although it was tighter in the UK;
- in the UK the method of allocating allowances was unsatisfactory;
- the ten per cent limit on auctioning of allowances in Phase II was too restrictive and in the UK the government should have chosen to auction more than seven per cent of allowances; and

2 Department for Business, Enterprise and Regulatory Reform (BERR) *EU Emissions Trading Scheme (EU ETS)* (2009). http://www.berr.gov.uk/whatwedo/energy/environment/euets/index.html [accessed 21/01/09].
3 House of Commons Environmental Audit Committee (2007) *The EU Emissions Trading Scheme: Lessons for the Future*. Second Report of the Session 2006-07. HC 70.

- the UK limit on the use of project credits generated by emissions reduction projects outside the EU was too high, as it meant that they could account for two-thirds of the emission reduction effort required during Phase II.

1.4 In this review we examine further these and other areas explored by the Committee, which are set out more fully in Appendix 1. We provide an update on the performance of the EU ETS incorporating the full data now available from Phase I. We also report the outcome of the recent negotiations on Phase III of the Scheme in order to provide the Committee with an overview of how far the Committee's concerns have been addressed.

The purpose of the Scheme

1.5 The primary purpose of the Scheme is to reduce CO_2 emissions in the most cost-effective and economically efficient manner. A cap and trade scheme should ensure that emissions reductions are achieved with maximum efficiency through giving industry a cost incentive to invest in low carbon or carbon abatement technology to reduce emissions. The price of allowances puts a cost on carbon emissions and should therefore encourage the development of low carbon or carbon abatement technologies, as well as structural changes in the economy and a move away from carbon-intensive products. The scale of emissions reductions sought should determine the tightness of the cap and hence the price of allowances. The trading of allowances should encourage

Figure 1
The EU Emissions Trading Scheme

The EU ETS is a cap and trade scheme – under which a total cap is determined for the amount of CO_2 emissions permitted and is made available to participants in the form of 'allowances'. At the end of each year participants must submit verified emissions data and enough allowances to cover their emissions. Participants may trade the allowances to buy more or to sell surplus allowances. Participants may also buy project credits for investments in emission reduction projects in developing countries which are established under the Kyoto Protocol and count towards countries' reduction targets under the Protocol. If participants do not have enough allowances and project credits to match their emissions they must pay a fine.

The 2003 Emissions Trading Directive provides the legislative basis for the Scheme and sets out its structure[1] as amended by a number of subsequent Directives. The Scheme operates in distinct compliance periods. Phase I operated from 1 January 2005 to 31 December 2007. Phase II commenced on 1 January 2008 and will end on 31 December 2012. Phase III will operate from 2013 to 2020.

The European Commission plays a central role in administering the Scheme, proposing policy for adoption through Directives, approving Member States' plans and monitoring the outcome from the Scheme. Member States have been responsible for proposing the total cap for CO_2 emissions for participants operating in their country; allocating free allowances to participants and auctioning them; determining the maximum amount of project credits participants may use; and administering the Scheme.

In December 2008 the European Parliament ratified proposals for significant changes to the EU ETS for Phase III.

Source: National Audit Office analysis of Departmental data

NOTE

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

those companies which can most cheaply reduce their emissions to do so and sell their surplus allowances to companies whose abatement costs are higher than the price of the allowances. With international trading, this should occur across national boundaries. Where companies need to buy allowances either through auction or from the open market, this adds to their costs. In some cases this can be passed on in the form of increased product prices for industry and ultimately the consumer.

1.6 The concept of emissions trading is enshrined in the Kyoto Protocol, which allows the establishment of trading schemes to help countries achieve their targets, set out in the Protocol, not only by trading among themselves but also by investing in emission reducing projects in developing countries and other developed countries (**Figure 2**). Phase II of the EU Emissions Trading Scheme corresponds with the Kyoto commitment period and provides for a link with the emissions register for the Kyoto Protocol, so that emissions verification and allowances under the EU Scheme fully correspond with the requirements for measuring the EU's compliance with its Kyoto target of reducing emissions by eight per cent.

Figure 2
The Kyoto Protocol and its mechanisms

At the 1992 United Nations conference on the environment in Rio de Janeiro most member countries of the United Nations agreed a treaty to tackle global warming and climate change: the United Nations Framework Convention on Climate Change (UNFCCC). The purpose of the UNFCCC was to set an overarching, international framework for intergovernmental effort to tackle the challenges posed by climate change. To date, 189 countries have signed the legally binding Convention. The Convention set out three key actions for governments in the fight against climate change:

- To gather and share information on greenhouse gas emissions, national policies and best practices.
- To launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries.
- To cooperate in preparing for adaptation to the impacts of climate change.

The Kyoto Protocol was developed in 1997 as a means to deliver the targets of the UNFCCC. The Protocol also set out emission reduction targets for most developed countries and three key mechanisms that can be used to facilitate the achievement of these targets:

- **Emissions trading.** Developed countries will be assigned allowances based on their 1990/1995 baselines, and will be able to trade these between themselves in order to help meet their targets. These allowances are known as Assigned Amount Units (AAUs).
- **The Clean Development Mechanism (CDM).** Developed country governments or companies may invest in emission reduction projects in developing countries and receive 'credits' towards domestic targets. These project credit allowances are known as Certified Emission Reductions (CERs).
- **Joint Implementation (JI).** This is similar to the Clean Development Mechanism, but applies to projects in other developed countries which have agreed a Kyoto target. These project credit allowances are known as Emission Reduction Units (ERUs).

The Protocol also allowed for 'burden sharing' between groups of countries such as the EU. The EU has a burden sharing target of an eight per cent reduction against 1990 levels and has agreed significant differences between individual Member States' targets (for example Portugal can increase emissions by 27 per cent while the UK must reduce emissions by 12½ per cent and Germany by 21 per cent).

The EU has implemented the Emissions Trading Scheme as one means to deliver its eight per cent target.

Source: UNFCCC

1.7 The Scheme is one of the EU's key measures for delivering its commitments under the Kyoto Protocol and for delivering its objective of demonstrating leadership in reducing emissions of greenhouse gases to help the world limit global temperature rise to 2°C. The EU has other targets and measures in place to reduce emissions and move towards a low carbon economy. In March 2007, the European Council endorsed proposals to achieve by 2020 an increase in energy efficiency of 20 per cent compared to projected 2020 levels; an increase in renewable energy to 20 per cent of total energy consumed; and a reduction in emissions of greenhouse gases of 20 per cent compared to a baseline of 1990. The Council agreed it would increase its emissions reduction target to 30 per cent if an international agreement for post-2012 Kyoto is reached at the 15th Conference of the Parties to the Framework Convention on Climate Change in December 2009. The EU envisages the possibility of linking the EU ETS to other trading schemes in order to develop a global carbon market and included a provision for this in its proposals to reform to the Scheme, which were agreed in December 2008. Key stages in the development of the EU ETS are set out in **Figure 3** overleaf.

1.8 Within the UK the Scheme is also one measure among many to achieve the government's Kyoto commitments and other related EU and national policy targets. The other key measures to reduce greenhouse gas emissions from industry include the Climate Change Levy and Agreements; Integrated Pollution Prevention and Control; the Renewables Obligation; and support schemes through the Carbon Trust and Enhanced Capital Allowances and other grant support for research and development.[4]

How we approached this review

1.9 This review is based on an examination of publicly available documentation and interviews with government departments, academics and other stakeholders. In addition, we employed consultants to conduct a survey of UK companies to determine the impact the EU ETS had had on them. The survey covered six industrial sectors participating in the EU ETS, and was carried out between September and November 2008. Our methodology is set out in Appendix 2.

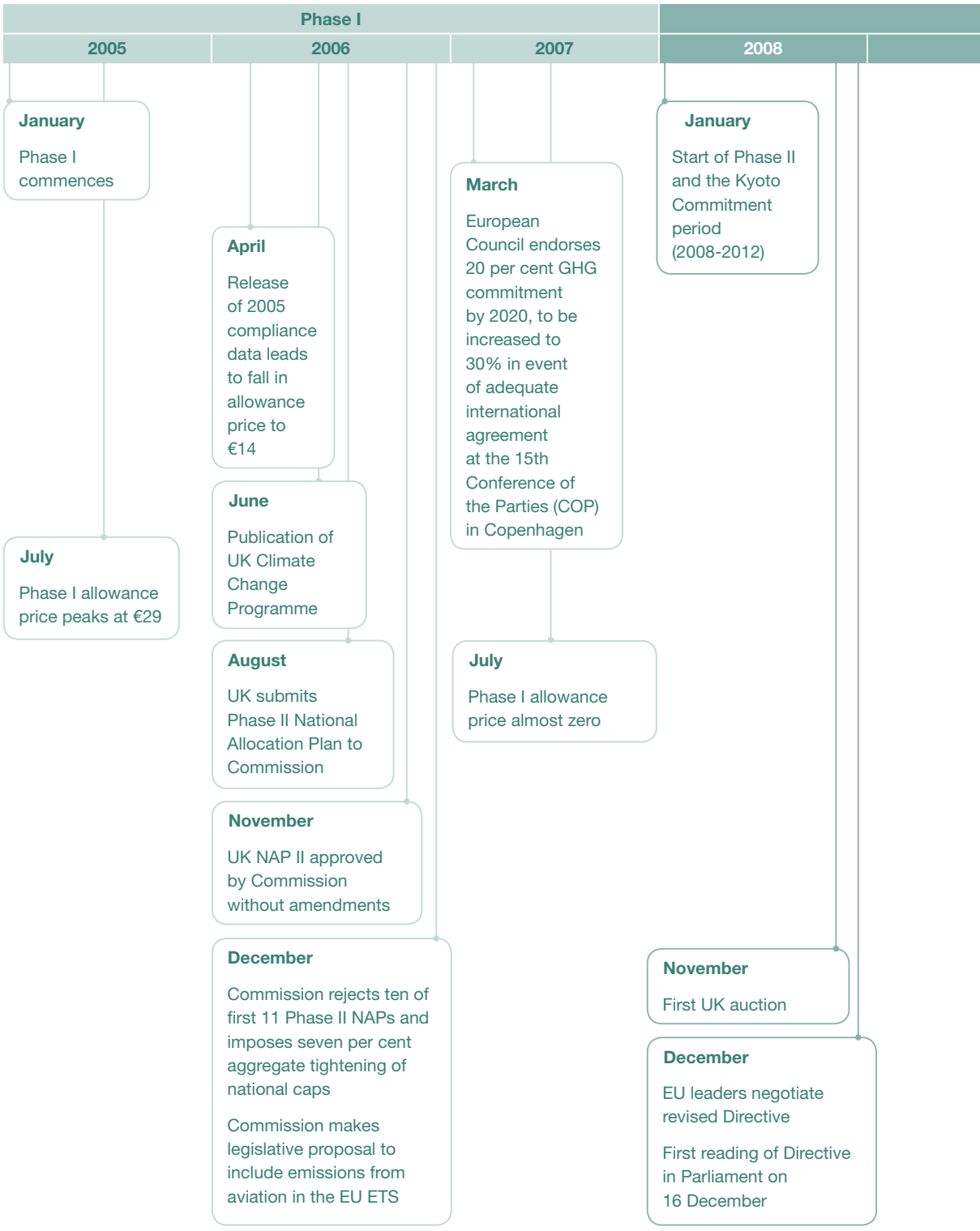
1.10 This review is structured as follows:

- Part 2 examines the structure and operation of the Scheme;
- Part 3 examines the impact of the EU ETS to date; and
- Part 4 examines the development of Phase III.

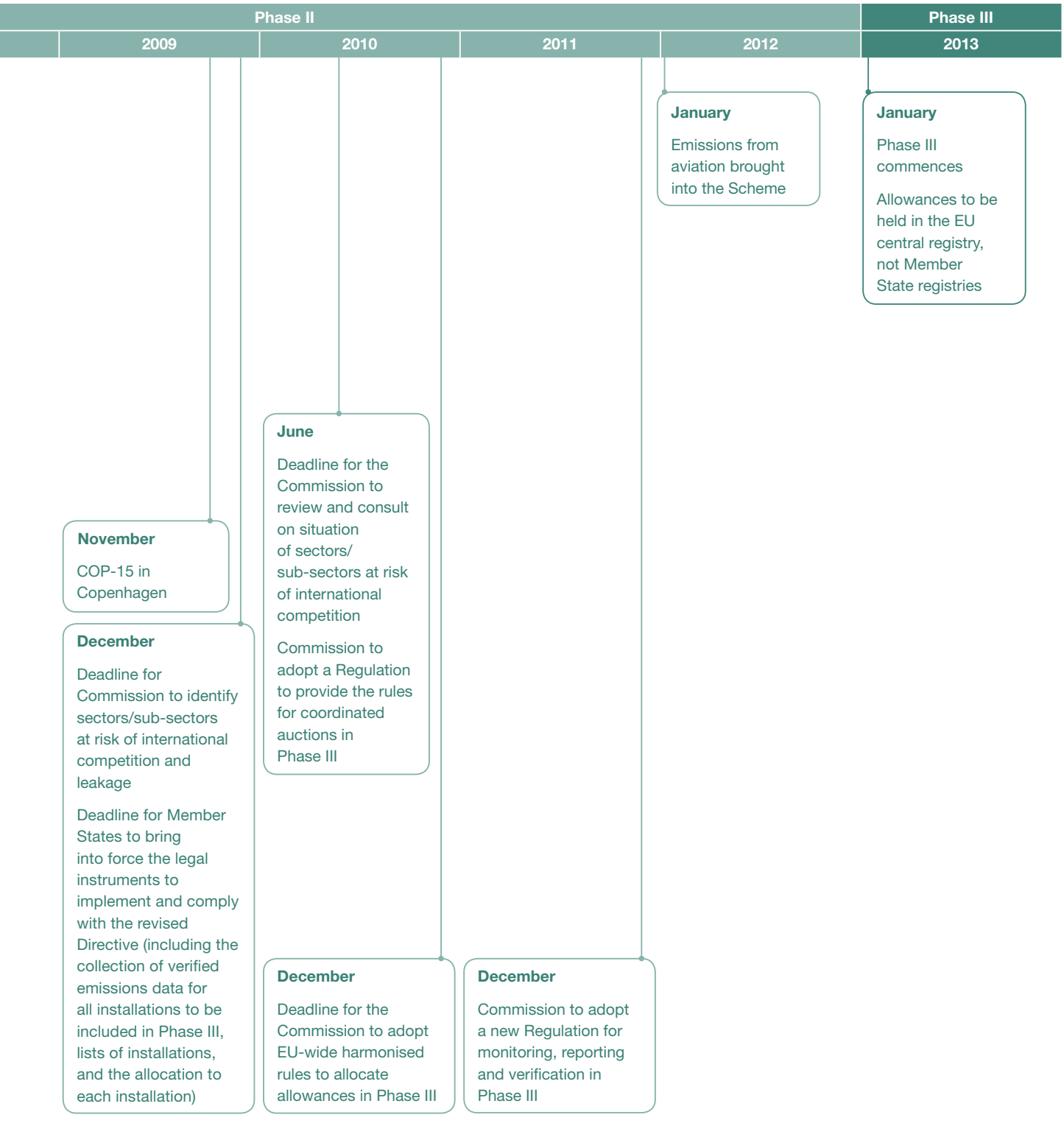
4 Department for Environment, Food and Rural Affairs (Defra) (2006) *The UK Climate Change Programme.*

Figure 3

EU ETS: timeline of key events 2005-2013



Source: National Audit Office


Phase II
Phase III
2009
2010
2011
2012
2013
January
Emissions from aviation brought into the Scheme
January
Phase III commences
Allowances to be held in the EU central registry, not Member State registries
June
Deadline for the Commission to review and consult on situation of sectors/ sub-sectors at risk of international competition
Commission to adopt a Regulation to provide the rules for coordinated auctions in Phase III
November
COP-15 in Copenhagen
December
Deadline for Commission to identify sectors/sub-sectors at risk of international competition and leakage
Deadline for Member States to bring into force the legal instruments to implement and comply with the revised Directive (including the collection of verified emissions data for all installations to be included in Phase III, lists of installations, and the allocation to each installation)
December
Deadline for the Commission to adopt EU-wide harmonised rules to allocate allowances in Phase III
December
Commission to adopt a new Regulation for monitoring, reporting and verification in Phase III

Part Two

The structure and operation of the EU ETS

Introduction

2.1 In its 2007 report, the Committee identified that, if the EU ETS was to achieve its environmental objectives, it was essential that it should prove to be an administrative success; and it praised the speed with which such a complex scheme was established across the 25 countries in the EU at that time. However, it also identified a number of structural aspects of the Scheme that could undermine its effectiveness.

2.2 In Phases I and II, responsibility for many aspects of the Scheme lay with individual Member States. In addition to determining the total quantity of allowances to be issued and auctioned and how much use could be made of credits generated by emission reduction projects outside the EU, Member States were responsible for determining the administrative arrangements for auctions, rules governing new entrants and site closures, and arrangements for monitoring and verification. Across the EU this resulted in different approaches, including differences between countries in the coverage of the Scheme, with some types of installations being included in some Member States and excluded in others.[5] Considerable responsibility therefore rested with the UK government for ensuring that the Scheme operated successfully in Phases I and II.

2.3 In this part, we therefore examine key structural aspects of the EU ETS and the manner in which it has functioned since 2005. These cover:

- total allocations and the use of project credits;
- the approach to determining and allocating the total quantity of allowances;
- the approach to auctioning;
- monitoring, reporting and verification processes; and
- the interaction between the EU and UN emission registries.

5 In the power sector, for example, the UK adopted a 'medium' definition of the term 'combustion activity' in Phases I and II such that only installations producing electricity, heat or steam for the sole purpose of electricity generation were included. Other Member States applied a 'broad' definition meaning that all combustion installations that produce electricity, heat or steam were included even if the purpose is not electricity generation.

The Commission reduced allocations to tighten the Phase II cap, but the use of project credits has weakened its impact

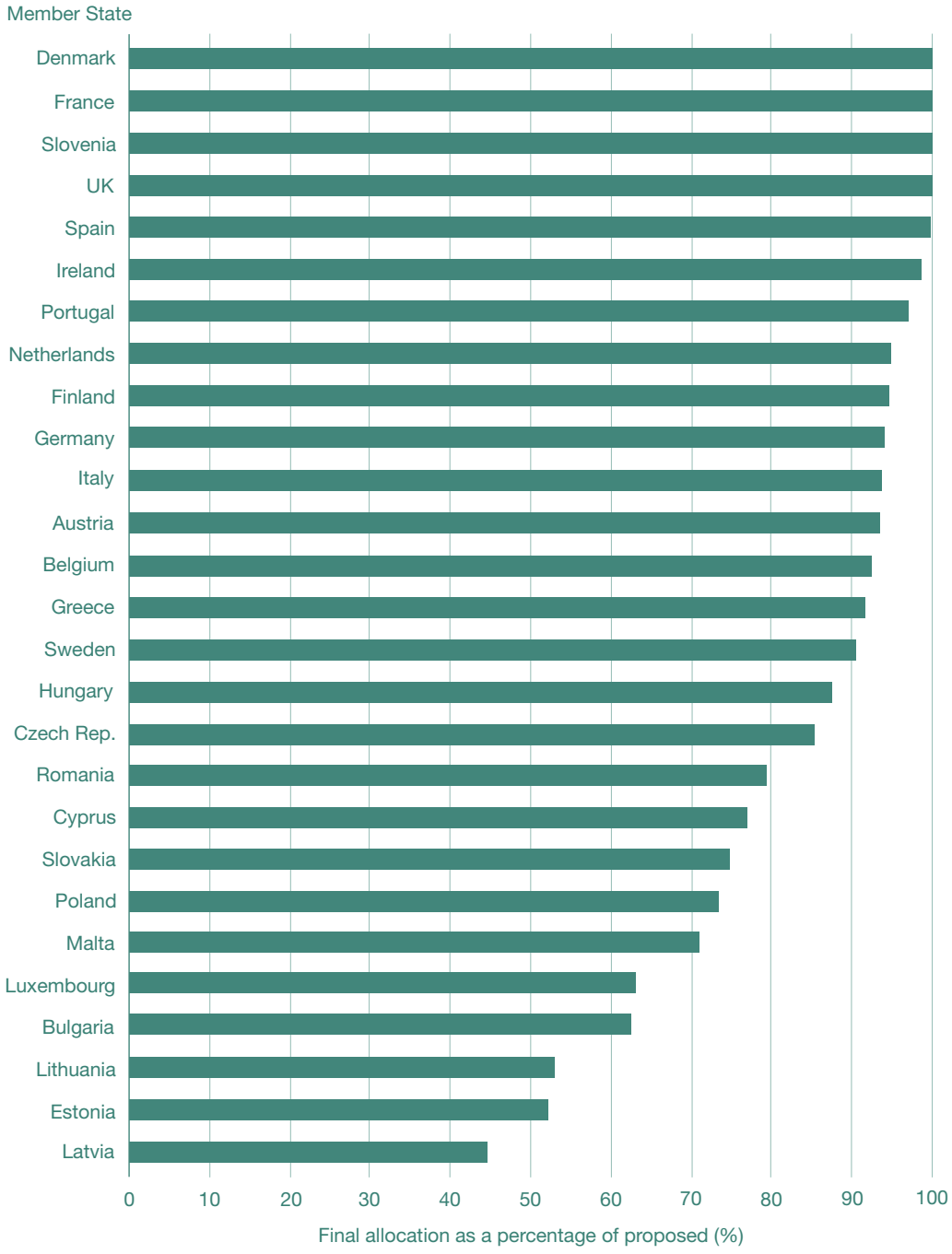
2.4 Under the Emissions Trading Directive, individual Member States must set out in a National Allocation Plan (NAP) the total quantity of allowances they will issue, how these will be distributed to installations, the limit proposed for the use of project credits, and other administrative aspects such as the number of allowances reserved for new entrants. The plans are then submitted to the Commission for scrutiny, and the Commission may propose changes.

2.5 Phase I was based on individual Member State total allocations which in total amounted to an EU-wide cap of 6,542 $MtCO_2$. Verified emissions across the three years were significantly below this (6,093 $MtCO_2$). At the time of publication of the Committee's report in 2007, the Commission had received 11 Phase II National Allocation Plans. It rejected ten of these on the grounds that the allocations were too generous and it reduced the quantity of allowances proposed, taking into account performance against Kyoto targets. The UK plan was the only one to be accepted. The remaining sixteen Phase II National Allocation Plans were submitted later in 2007, and the Commission reduced national allocations in twelve of these. In all, only five of the 27 Phase II National Allocation Plans were approved unaltered (**Figure 4** overleaf).

2.6 In Phase II (unlike Phase I), Member States may utilise project credits arising from investments in developing countries through the Kyoto Clean Development Mechanism and Joint Implementation mechanisms. EU ETS rules require Member States to set a quantitative limit for the use of project credits but do not set a maximum level, though the Commission has stated that domestic action should constitute a significant element of the emission reduction effort. The UK government set a limit of eight per cent, but other Member States – including Spain, Germany and Lithuania – set limits of up to 20 per cent (**Figure 5** on page 21). Industries operating in states which have set high limits will have the option of reducing their emissions less and buying project credits instead.

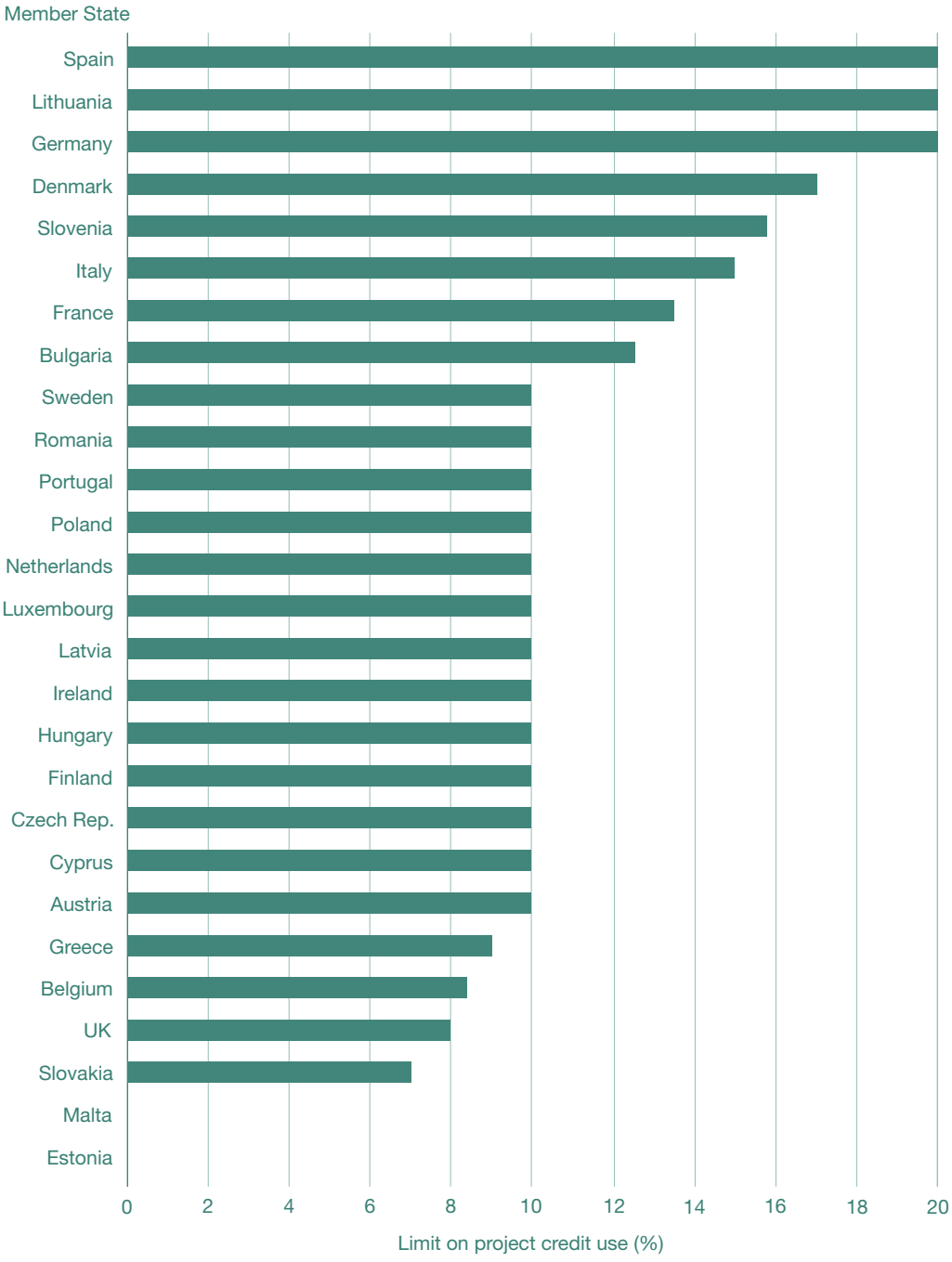
2.7 The EU ETS cap for Phase II represents the sum of all approved national allocations made by Member States. The maximum level of allowable emissions within the EU is higher than the cap as it also includes the sum of allowable project credits. Taken together, the cap and the credits have not required an absolute reduction in the maximum allowable annual emissions in Phase II compared to Phase I (**Figure 6** on page 22). Indeed, in relation to 2005 verified emissions, the maximum use of project credits in Phase II as set out in approved National Allocation Plans would result in an increase in emissions of seven per cent (Figure 23 on page 59). Recent changes to the EU ETS have meant that installations can bank allowances and any unused portion of the limit for project credits set by individual Member States into Phase III. The implications of this are discussed in Part Four.

Figure 4
Reductions imposed by the European Commission on Phase II National Allocation Plans



Source: European Commission

Figure 5
Limits in the use of project credits in Phase II (as percentage of free allocation)



Source: European Commission

Figure 6
EU allocations, project credits, and allowable emissions in Phases I and II ($MtCO_2$)

		Phase I	Phase II
Allocations (cap)	Total allocations for whole period	6,542	10,400
	Average annual allocations	2,181	2,080
Project credits	Maximum use of project credits over whole period	Nil	1,400
	Average annual use of project credits	Nil	280
Allowable emissions	Maximum annual emissions	2,181	2,360
	Maximum annual emissions (excluding new Phase II installations)[1]	2,181	2,305

Source: National Audit Office/European Commission

NOTE
1 Of the annual Phase II allocation of 2080 $MtCO_2$, 2025 $MtCO_2$ relates to installations that operated in Phase I and 55 $MtCO_2$ to installations entering the EU ETS in Phase II due to the wider scope of the Scheme.

In the UK, most sectors were allocated allowances in line with projected growth

2.8 For Phase I, the UK government determined the number of allowances it would allocate by reference to business as usual emission projections for both EU ETS sectors and other sectors of the economy. It then calculated how much EU ETS sectors should contribute towards emissions reductions over Phase I in order to meet the UK's Kyoto and domestic targets. This quantity of emissions was subtracted from the emissions projections for all EU ETS sectors in order to arrive at the total allocation. Companies participating in the UK Emissions Trading Scheme and in Climate Change Agreements were allowed to opt out of Phase I and the total Phase I allocation was reduced to take account of opted-out installations. The determination of sectoral allocations was complicated by the fact that the term 'sector' had different meanings in relation to the energy projections, the Climate Change Agreements, and the EU ETS. The difference between the business as usual projections for EU ETS sectors and the allocation is often referred to as the emissions reduction 'effort'.

2.9 The total UK Phase I allocation of 245 $MtCO_2$ a year amounted to an eight per cent reduction below business as usual forecasts. The government determined that the power sector should be the only sector to be allocated allowances below their business as usual forecasts, making it responsible for delivering all the 'effort' involved in reducing emissions, while other sectors received allocations in line with their business as usual projections (**Figure 7**). The government adopted this approach on the grounds that the power sector faced limited international competition and could achieve large reductions in emissions at relatively low cost by switching from coal to gas.

Figure 7
UK emission projections and allocations in Phase I ($MtCO_2$)

		Sectors (Phase I total)		Phase I total	Phase I annual average
		Power sector	Other sectors		
Business as usual forecast	Emission forecasts for participating installations[2]	477	325	802	267
Allocation and allowances available	Total allocation	411	325	736	245
	Less: allowances in respect of opted-out installations	0	62	62	21
	Less: allowances not issued to installations from NER	4	8	12	4
	Total allowances issued	407	255	662	220
Allowances issued	Allowances issued to existing installations	392	234	626	208
	Allowances issued to new entrants	15	21	36	12
	Total allowances issued	407	255	662	220

Source: Defra Phase I National Allocation Plan (May 2005)

NOTES
1 Some totals are adjusted due to rounding effects.
2 The figure of 802 $MtCO_2$ includes projected emissions for installations opted out as a result of UK Emissions Trading Scheme (UK ETS) and the Climate Change Agreements (CCA) participation and predicted emissions for new entrants.

2.10 For Phase II, the UK government adopted a very similar approach, determining the total allocation to UK installations by reference to business as usual forecast emissions. As in Phase I and for the same reasons, only the power sector was allocated significantly fewer allowances than business as usual projections. The annual average UK Phase II allocation of 246 $MtCO_2$ was the same as the Phase I allocation, despite an increase in the number of installations participating in the Scheme from around 700 to 900, thus representing an absolute reduction in emissions compared to Phase I.[6] It also represented an 11 per cent reduction against business as usual forecasts (**Figure 8** overleaf).

2.11 Although the Phase II allocation of allowances represented an absolute reduction in emissions compared to Phase I, the potential use of project credits could significantly reduce its impact. UK installations may utilise up to 91 $MtCO_2$ of project credits, compared to the overall effort required by the cap on allowances of 151 $MtCO_2$ below business as usual. This means that the use of project credits could account for 60 per cent of the emission reduction effort required in Phase II.

6 This is due to the inclusion of 330 sites previously exempted from the EU ETS as a result of Climate Change Agreements, and the exclusion of approximately 90 small installations as a result of an increase in the minimum eligibility threshold. See Defra (2007) *EU Emissions Trading Scheme Phase II (2008-2012) Overarching Full Regulatory Impact Assessment*.

Figure 8

UK emission projections and allocations in Phase II ($MtCO_2$)

		Sectors		Phase II total	Phase II annual average
		Power sector	Other sectors		
Business as usual forecast	Emission forecasts for eligible installations	771	608	1,379	276
Allocations (cap)	Allowances issued to existing installations	524	535	1,059	212
	Allowances reserved for new entrants	40	42	82	16
	Allowances for auction			87	17
	Total allocation	**564**	**577**	**1,228**	**246**
Project credits	Maximum use of CDM and JI project credits			91	18
Emissions limit	UK maximum emissions (excluding the scope for buying foreign EU allowances)			1,319	264

Source: Defra Phase II National Allocation Plan and final allocation document

2.12 The extent of use of project credits should reflect the relative efficiency of investment in abatement within the Scheme and outside of the EU. However, the availability of project credits and allowances in the market, compared to demand, can affect their relative prices and the financial incentives in relation to their use. In practice EU ETS allowances have until recently traded at approximately €10 above the market price of project credits (Figure 20). Even those installations which have received enough EU ETS allowances to cover their emissions could therefore earn additional revenue by selling some of their allowances and buying cheaper project credits. In our October 2008 survey, we therefore asked UK companies about the extent to which they were planning to use project credits for compliance purposes. Forty-six per cent of respondents said that they were planning to do so, and 17 per cent of respondents were expecting to use project credits even though their emissions will be lower than their allocations. Since the survey EU ETS allowance prices have fallen sharply to around €11 in March 2009. The price differential with project credits has been largely eroded since late 2008, thus reducing the financial incentive to undertake such swaps.[7]

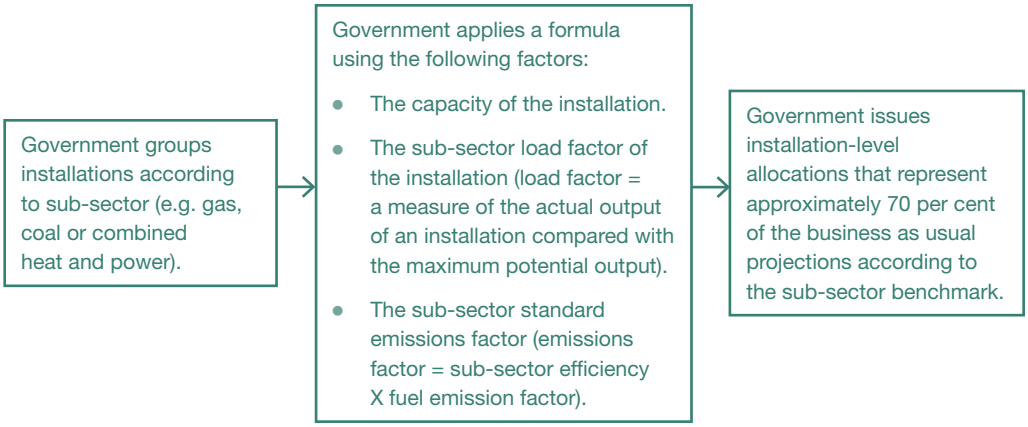
7 See paragraph 3.25.

The UK government allocated allowances to the power sector using technology benchmarks rather than historic emissions levels

2.13 In its 2007 report the Committee expressed concern over the way in which allowances were allocated to individual installations. It argued that allocating allowances based on past emissions levels ('grandfathering') encouraged companies to increase emissions to receive higher allocations in the future. The Committee advocated that the government should use 'benchmarks' instead. Benchmarking is an approach to allocating allowances based on the use of performance standards and production indicators (**Figure 9**). It sends a signal to companies to improve their environmental performance, as those companies which are less efficient will be allocated fewer allowances relative to their need than their competitors to cover their emissions. By contrast, 'grandfathering' may give inefficient companies more allowances than their more efficient competitors, which are therefore penalised for investments already made.[8]

Figure 9
The use of benchmarks to allocate allowances

The approach to benchmarking used by the government to allocate allowances to the power sector in Phase II is set out below:



Source: National Audit Office analysis of Defra Phase II National Allocation Plan

8 Defra & Office of Climate Change (2007) *Analysis paper on EU Emissions Trading Scheme Review Options* p.22.

2.14 In Phase I, the government used grandfathering for allocating all allowances, except for those available from the New Entrant Reserve. For Phase II, the government used benchmarking to allocate allowances to the power sector, but continued to use grandfathering for all other sectors. This resulted in some changes in allocations for individual power generating installations between Phases I and II. The approach to benchmarking adopted by the government was based on the input fuel of installations: coal-fired and gas-fired power stations therefore had different benchmarks, with coal-fired generators receiving more allowances for the same quantity of electricity generated than gas-fired generators. An alternative would have been to have based benchmarks on output indicators (such as the amount of CO_2 produced per megawatt hour generated). This would have significantly penalised higher emitting generating technologies such as coal.

The current arrangements for new entrants and site closures may reduce the incentive to invest in cleaner technologies

2.15 Under the emissions trading Directive Member State governments are permitted to set aside a quantity of allowances to allocate to new and expanding sites. The UK government defines the term 'new entrant' to include both.[9] The government adopted a similar approach in Phases I and II, by diverting a percentage of sector allocations to form a New Entrant Reserve. Companies may apply to the government to receive allowances from the Reserve free of charge and the government issues allowances on the basis of standardised benchmarks for the activity in question. If the Reserve runs out of allowances, any subsequent new entrants need to purchase allowances from the market. As a percentage of total allowances, the Phase II Reserve is slightly larger than it was in Phase I (82 $MtCO_2$ or 6.6 per cent of total Phase II allocations compared with 46.8 $MtCO_2$ or 6.3 per cent of total Phase I allocations). Phase II new entrants (and site expansions) may also obtain allowances from the market or auctions.

2.16 In Phase I, the rules regarding site closures meant that a company would receive the full annual free allocation for the year in which a site closed, but that allocations for future years would be withdrawn and placed in the New Entrant Reserve. In Phase II, withdrawn allowances are instead added to the quantity of allowances for auction, provided the latter does not increase above ten per cent of the total national allocation.

2.17 Allocating free allowances from the Reserve and taking them from closing sites removes the distortionary effect of free allocation benefiting existing installations over new entrants but does not necessarily maximise the incentives for industry to reduce their emissions. Providing free allocations for new entrants supports the expansion of industry and its emissions although using benchmarking provides some incentive to use the most efficient technology. Withdrawing future allocations from closed installations may provide an incentive to companies to keep a heavily polluting installation open for longer in order to retain the associated allowances.[10] However, had the government allowed operators to retain allowances following an installation's closure, they would have been able to generate revenue without any economic activity.

9 Defra (2005) *Appendix C: New Entrants, Closures and Auctioning*.
10 Grubb & Neuhoff (2006) Allocation and competitiveness in the EU Emissions Trading Scheme: policy overview. *Climate Policy*, 6 (4) pp. 7-30.

The government auctioned fewer allowances than it was entitled to in Phase I and Phase II

2.18 Under the EU ETS Directive Member States were permitted to auction up to five per cent of their total national allocation in Phase I, increasing to ten per cent in Phase II. The precise quantity of allowances to be auctioned, the design of auctions and the use of auction revenues are issues for Member States to determine independently of the Commission. The Committee criticised the allocation of allowances free of charge and supported the use of auctioning on the grounds that the latter:

- increased the accuracy of allocations as companies will only buy what is needed to cover actual emissions;
- reduced the cost of the Scheme to the public and reduced the bureaucracy of the allocation process; and
- internalised the costs of pollution by making the 'polluter pay'.

The Committee also expressed its disappointment that the Directive placed restrictions on the maximum quantity of allowances that Member States were permitted to auction and that the government decided to auction fewer allowances than allowed under the Directive in Phase II.[11]

2.19 The emissions trading Directive places a legal requirement on Member States to distribute the full quantity of allowances agreed with the Commission in their National Allocation Plans. During Phase I the government planned to auction only unused allowances in the New Entrant Reserve, provided that these allowances amounted to less than five per cent of the total UK allocation. At the end of the Phase, approximately 11.7 million allowances remained in the Reserve of which 1.2 million allowances related to installation closures. The government sold 5.8 million allowances via a commercial sale and the remaining 5.9 million allowances were withdrawn and cancelled because the allowance price was too low to warrant releasing further allowances onto the market. Other Member States also made minimal use of auctioning in Phase I, with only four smaller countries selling any allowances in this way.[12]

2.20 In Phase II the government has decided to auction seven per cent of the total UK cap (87 million allowances). In addition, any allowances withdrawn from companies following installation closures and any surplus from the New Entrant Reserve will also be auctioned, up to a maximum of 40 million allowances. Combined, these allowances equate to ten per cent of the UK Phase II cap – the maximum allowed by the Commission.

11 See Environmental Audit Committee (2007) *The EU Emissions Trading Scheme: Lessons for the future*. Second Report of 2006-07, HC 70.

12 Denmark (5% of national allocation), Hungary (2.5% of national allocation), Ireland (0.75% of national allocation), and Lithuania (1.5% of national allocation). See EU ETS.com (2007) *Lithuanian emissions auction success expected*. https://www.euets.com/index.php?page=news&newsid=62&l=1 [accessed 23/10/08]. Kettner, C., Koppl, A., Schleicher, S. & Thenius, G. (2008) Stringency and distribution in the EU Emissions Trading Scheme: first evidence. *Climate Policy* 8 pp.41-61.

2.21 Germany is the only Member State other than the UK which is planning to auction a large quantity of allowances in Phase II. The German government has decided to sell nine per cent of the country's allocation (40 million allowances per year). In 2008 and 2009, it plans to release up to four million allowances each month by putting them on sale at the current market price.[13] From 2010, it will change to using competitive auctions in which the price will be defined by the bids received.

UK Phase II auctions are intended to be accessible to all EU ETS participants

2.22 The government implemented the legal provisions for Phase II auctions through an amendment to the Emissions Trading Regulations. This stipulated that the government must announce its intentions to auction allowances at least two months prior to the auction date, and the quantity of allowances to be auctioned at least one month prior to the auction date.

2.23 Auctions in the UK will allow both 'competitive' and 'non-competitive' bidding. The first auction in Phase II, carried out in November 2008, was a competitive auction in which companies were required to place bids for allowances via an intermediary known as a Primary Participant. Bids in the competitive auction must be a multiple of 1,000 allowances. In total, 3,999,875 allowances were sold at a clearing price of €16.15 each, totalling €64.4 million (£54.4 million).[14] The auction was over four times oversubscribed with the government receiving more than 16.5 million bids. The government chose this approach because it represented an efficient way of managing the risks associated with dealing with counterparties and the need for a range of financial and security checks.

2.24 The government has also developed a 'non-competitive' approach in order to ensure that smaller companies which are buying for compliance purposes only may also have access to auctions. Bidders are required to register with an auction 'administrator', and can bid for between one and 10,000 allowances. Future auctions will incorporate both a competitive and non-competitive bidding facility.

2.25 In each auction, the government sets a reserve price for allowances in order to protect against extreme price volatility.[15] The government calculates the reserve price by applying a discount rate and markdown to the secondary allowance price.

13 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2008) *Release of EU Allowances in Germany – Monthly report November 2008*. http://www.bmu.de/files/pdfs/allgemein/application/pdf/monatsbericht_kwf_0811_en.pdf [accessed 13/01/09].

14 One hundred and twenty five allowances were unsold due to the formula used to calculate the quantity of allowances issued to bids places at exactly the clearing price. All bids made in excess of the clearing price received the full quantity of allowances bid for. The government then calculated the ratio of remaining allowances to the quantity of allowances bid for at the clearing price. Bidders at this price received a pro rata quantity of allowances.

15 Defra (2008) *FAQs on Auctioning*, p2. The risk of a price crash may now be reduced because recent changes to the Scheme allow Phase II allowances to be carried forward into Phase III.

2.26 Although the first UK auction in Phase II was oversubscribed, the situation has changed significantly as a result of the recent economic downturn in Europe and the devaluation of Sterling against the Euro. As most companies have received allocations broadly in line with their business as usual emission projections for the period 2008-2012, any decrease in production will lead to emissions being lower than the allocations of allowances they received. If high numbers of companies sell surplus allowances, there is a risk that the over-supply of allowances to the market could lead to a price crash similar to that experienced in Phase I.[16] In these circumstances, there may be limited demand for purchasing allowances through auctions.

2.27 The Committee commented in its 2007 report that the government should use the revenue generated by the auctioning of allowances in Phase II to fund measures to address climate change. However, auction revenues are paid directly into the Consolidated Fund. The government believes that the primary purpose of the Phase II auctions is to release allowances into the EU ETS market, not to generate revenue; and that the earmarking of revenues from Phase II auctions would not necessarily represent the most efficient approach for allocating public resources.

Procedures for monitoring, reporting and verifying emissions have been successful

2.28 Under the EU ETS Directive companies participating in the scheme are required to monitor their emissions, have their emissions verified by an accredited verifier, and report their emissions annually to the relevant Member State authority. Companies failing to surrender sufficient allowances to cover their verified emissions must pay a penalty and buy the required number of allowances from the market. In Phase I the penalty was €40 per tonne CO_2. In Phase II the EU increased the penalty to €100 per tonne CO_2 (plus the cost of purchasing allowances). In 2004, the Commission introduced guidelines on monitoring and verification to establish a minimum level of consistency across the EU while allowing some discretion regarding the practical implementation of the guidelines.

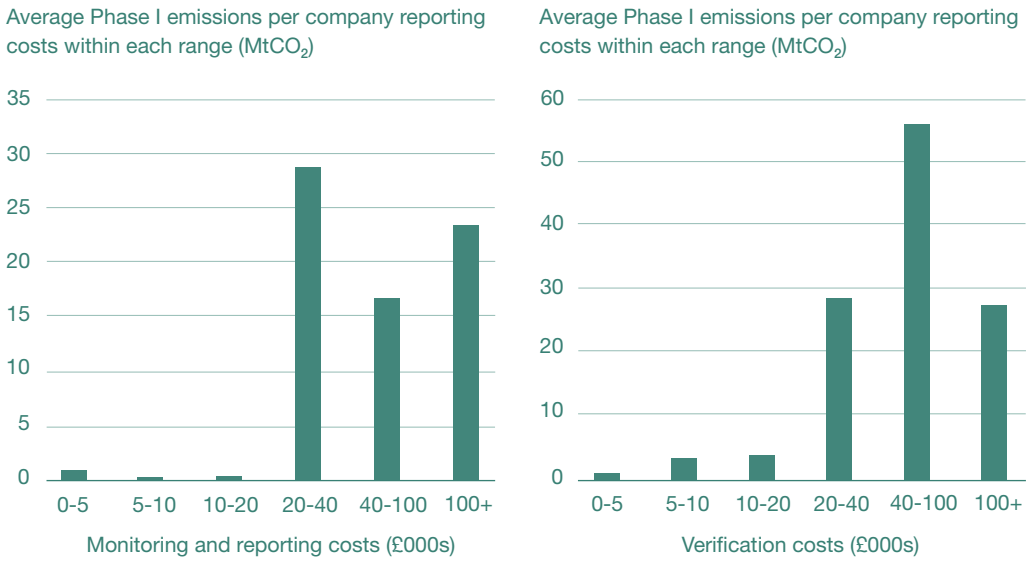
2.29 The costs of monitoring, reporting and verification are borne by companies and are largely dependent on the size and activity of the installation in question. To minimise the administrative burden of the Scheme on smaller emitters, when assessing eligibility against the 20MW threshold for EU ETS participation in Phase II, the government allowed companies to exclude component activities of up to three MW thermal output.[17] This change led to 90 small installations (accounting for only 0.24 per cent of EU ETS emissions) being removed from the EU ETS.[18] The government also applies different tiers of monitoring and reporting requirements, with large emitters facing the most stringent requirements.

16 See paragraphs 3.23-3.27.
17 If an installation contained several combustion activities all of which are less than three MW, it would be excluded from the scheme even if the aggregate capacity of these activities is greater than the 20 MW threshold. However, if an installation does meet the criteria for inclusion, then all combustion activities – including those less than three MW – must be included in the Scheme.
18 Defra (2007) *EU Emissions Trading Scheme Phase II (2008-2012) Overarching Full Regulatory Impact Assessment.*

2.30 The administrative cost of the EU ETS was the most frequently cited negative impact of the scheme according to respondents to our October 2008 survey, though only ten per cent of respondents wanted to change existing arrangements as this would create additional financial costs. We found that the average annual cost of monitoring and reporting was £26,000 and the average annual verification costs were £9,000. **Figure 10** compares compliance costs for respondents to our survey to the scale of their emissions, and broadly confirms the correlation between the two. However, we also found that high internal monitoring and reporting costs do not necessarily translate to equally high verification costs. This could be because verification costs are related to the verifier's evaluation of risks (which should be lower the better the operator's monitoring and reporting) and the corresponding size of the data sets the verifier then needs to look at; whereas internal costs may be affected by issues such as the operator's level of in-house expertise and the operation of IT systems.

Figure 10

Annual monitoring, reporting and veritifcation costs incurred by survey respondents in Phase I



Source: National Audit Office

NOTE
The graphs show average emissions for those companies reporting within each cost range.

2.31 To date there have been very few instances of UK companies failing to comply with the rules of the Scheme. In the UK in Phase I there were only four cases of companies failing to surrender sufficient allowances to account for verified emissions.[19] The severest of these breaches involved a steel works which surrendered allowances after the deadline for the 2005 compliance year. As a result of missing this deadline, they incurred a civil penalty of £564,000. Compliance risks may now be greater given the economic downturn affecting the UK economy.

Technical issues led to a delay in issuing allowances in 2008

2.32 Member State governments are required to issue allowances for a given calendar year by 28 February of that year and companies are required to submit their emissions data and present allowances for the previous calendar year by the end of March. The overlap of the timescales means that companies can 'borrow' allowances from the present year allocation to meet the compliance requirements for the previous year.

2.33 In order for EU ETS participants to be able to use project credits to meet their annual compliance requirements, the Commission has had to establish a link between EU ETS registries and the UN trading registry. This connection was intended to be in place by the start of Phase II (January 2008) but did not in fact become operational until October 2008. Although some other Member States chose to issue EU ETS allowances earlier in 2008, the UK government decided to delay issuing allowances until the link was operating satisfactorily. This avoided the administrative and legal complexity involved in retrospectively matching all EU ETS allowance data within the UN registry. UK allowances were finally issued at the end of October 2008.

2.34 In our October 2008 survey respondents reported to us that the EU ETS was operating well. However, nearly half (43 per cent) of the respondents exhibited some concern relating to the government's decision to delay issuing 2008 allowances. Issues raised included perceptions of reduced market liquidity as companies were not in possession of their allowances, increased uncertainty with regards to financial planning, and problems in interpreting the impact of the delay in issuing allowances on pre-existing contractual agreements between sellers and buyers of EU ETS allowances. Now that the EU and UN registries have been successfully connected it is unlikely the associated problems will arise again unless another event causes the government to delay issuing allowances in a future year.

19 Defra (2006) *EU Emissions Trading Scheme – 2005 results for the UK. Summary Sheet 1: UK Summary* and the Community Independent Transaction Log.

Part Three

The impact of the EU ETS to date

Introduction

3.1 This part of the report examines the impact of the first two phases of the EU ETS in terms of their effectiveness in reducing emissions.[20] The Committee considered this issue at some length in its February 2007 report and in publishing the government response. It expressed various concerns – in particular in relation to the use of business as usual projections as a basis for calculating the reductions achieved. Since the Committee's main report, final verified data for Phase I has become available and Phase II caps have been agreed with all Member States. The following sections review key issues of interest to the Committee in the light of the further information now available. They cover:

- The inherent difficulty of assessing the effectiveness of the EU ETS;
- Outturn data on Phase I emissions;
- The likely impact of Phase II on emissions;
- The price of emissions allowances and their impact on behaviour and investment;
- Impacts on the competitiveness of UK companies and the issue of windfall profits; and
- The role of other policy instruments.

There are inherent difficulties in assessing the impact of the EU ETS

3.2 Sectors participating in the EU ETS are subject to a highly complex economic and regulatory landscape which influences their emissions. Operational efficiency, and the scale and nature of investment in these sectors, will depend on basic economic factors, such as the level of growth in the economy, the price of fossil fuels, exchange rates and international competitiveness. The volatility of fossil fuel prices over the last three years and the impact of the recent economic downturn have visibly demonstrated the effect such factors can have. There are complex regulatory frameworks in place, and a range of environmental policy instruments in the energy sector also seek to influence industry's operational and investment decisions, to promote the use of renewable energy and reduce greenhouse gas emissions, and to support a range of other policy objectives such as security of supply, the relief of fuel poverty, and the eradication of acid rain.

20 The impact of Phase III proposals are discussed in Part Four.

3.3 In this context, evaluating the impact of the EU ETS is exceptionally difficult for a number of reasons:

- As the EU ETS is an international trading scheme, its effectiveness can only be properly assessed at an EU level. Some Member States may have more scope for reducing emissions than others, and an imbalance in the carbon account of an individual country needs to be seen in the context of the overall position across the EU. While some data is readily available at EU level, other data is less accessible, in particular verified outturn emissions information is available across the EU, but business as usual emission projections for all Member States is not.

- Phase I and II allocations were determined by reference to business as usual emissions forecasts, and the government's general approach to assessing the impact of such schemes is to compare the outcome against such forecasts. For the EU ETS these forecasts were based on a range of complex assumptions about economic growth, technology and trading. In reviewing the outcome of the Scheme it can be difficult to disentangle the effects of the Scheme from these more general economic factors. These assumptions can also prove inaccurate, reducing the value of outturn comparisons against forecasts; while information asymmetry can affect more detailed sectoral projections, as the government does not have the same level of access to commercial information as companies.

- Where there are a number of policy instruments in operation it can be difficult to attribute the outcome to one. Modelling of the interaction of policy instruments can be undertaken at the policy design stage, but it is difficult to model precisely after the event what would have happened in the absence of the policy instrument and the degree of uncertainty associated with the results can be considerable. Alternatively, surveys and detailed case studies can be undertaken to assess the impacts of a policy at an operational level, but commercially sensitive information is often difficult to obtain and the results can be difficult to quantify or evaluate in national terms.

- Assessing the impact of the EU ETS simply by reference to the overall cap set and outturn performance is insufficient, as it fails to take account of the above factors. If emissions are lower than the cap, this cannot necessarily be taken as an indication of the success of the Scheme because allowances might have been over-allocated in the first place. Even adherence to a progressively reducing cap, as now proposed for Phase III[21], fails to take account of the possibility that other economic factors may be driving a reduction in emissions.

3.4 Assessing the impact of the EU ETS to date is therefore difficult because of the sheer complexity of the drivers affecting commercial decisions made by participating sectors, and the problems of disentangling a single factor – perhaps relatively small – from others. For all these reasons, the government has not tried to carry out an ex post evaluation of Phase I. There are, however, a number of areas which can provide indications of the Scheme's effect, and we consider these below. These include less quantifiable benefits the scheme may have had in terms of raising awareness within industry of the importance of reducing carbon emissions and of carbon pricing as a means of doing so.

21 See Part Four.

Emissions in Phase I were significantly below the EU-wide cap

3.5 Phase I was based on individual Member State allocations which in total amounted to an EU-wide cap of 6,542 $MtCO_2$. Verified emissions across the three years were significantly below this (6,093 $MtCO_2$), and only four Member States exceeded their allocations: Italy, Spain, Slovenia, and the UK (**Figure 11**).[22]

3.6 Most experts consider this outcome was due to the over-allocation of allowances to ETS sectors, rather than to the impact of the Scheme itself.[23] Possible reasons why over-allocation might have occurred include:

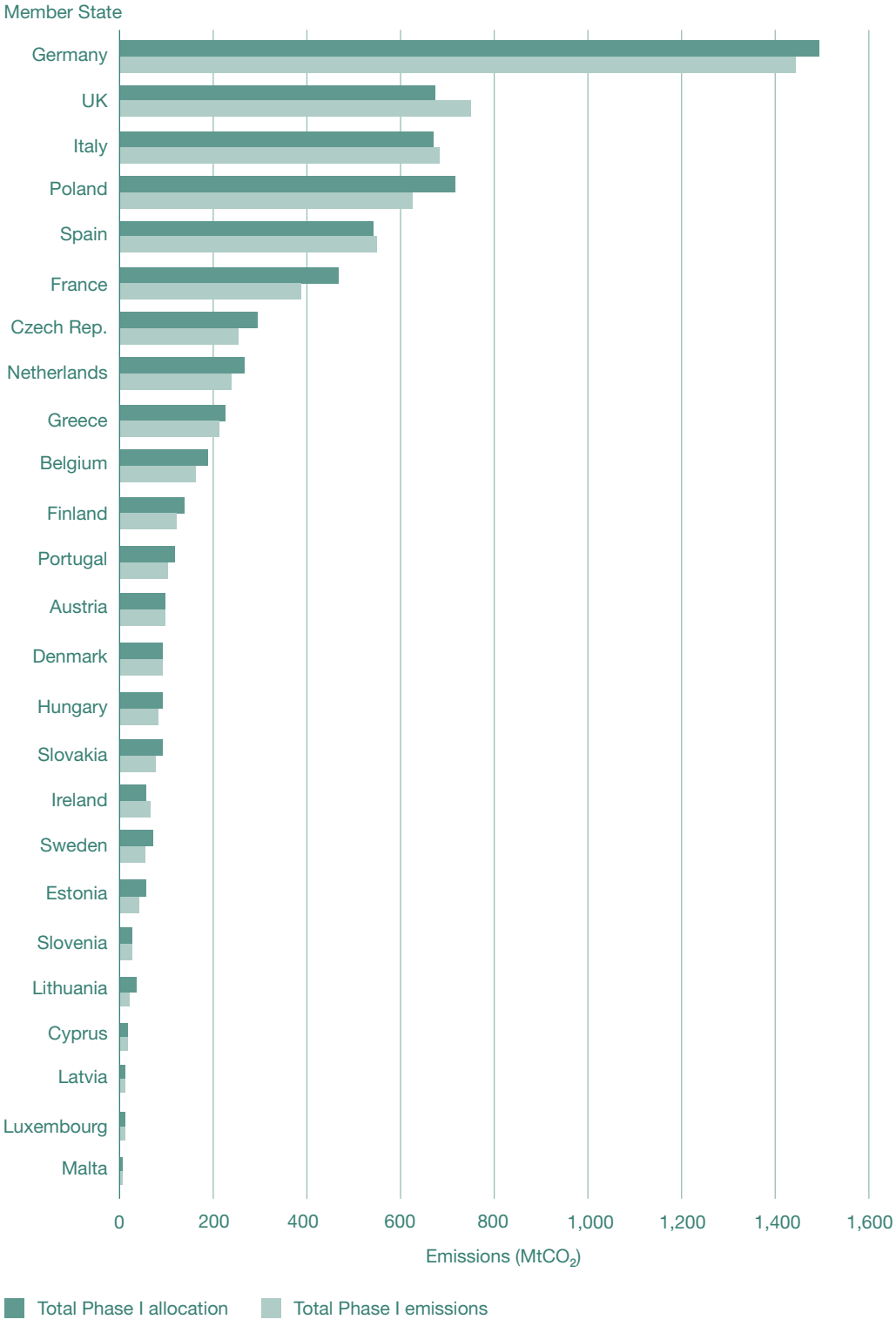
- Inaccurate baseline data for ETS industrial sectors.
- Forecasts of industrial growth which proved too optimistic.
- The desire in each Member State not to subject ETS sectors to any tighter a cap than those imposed by other Member States.

3.7 In the UK, greenhouse gas emissions have declined from 1990. Against this trend, baseline emissions data for UK EU ETS sectors rose between 1998 and 2003, while verified emissions increased between 2005 and 2006 (**Figure 12** on page 36). In each of the three Phase I years, emissions from EU ETS installations in the UK have been higher than the national cap, and the UK has therefore had to purchase allowances issued by other Member States to comply with the Scheme. While companies did incur some costs for purchasing allowances in 2005, the crash in the price of allowances from May 2006 meant that compliance could be achieved at minimal cost in 2006 and 2007. In total, Phase I emissions exceeded allocations by 13 per cent (**Figure 13** on page 36).

22 These statistics are based on Community Independent Transaction Log data for total available allowances in each Member State, including New Entrant Reserves.

23 A study undertaken by the Massachusetts Institute of Technology, Mission Climate/Caisse des Depots and University College Dublin suggested that the Scheme had had a significant 'announcement' effect by encouraging emission reductions even before it had become operational. The EAC argued that such an effect is unlikely to have been significant. Convery, F., Ellerman, D. & de Perthuis, C. (2008) *The European Carbon Market in Action: Lessons from the First Trading Period – Interim Report.*

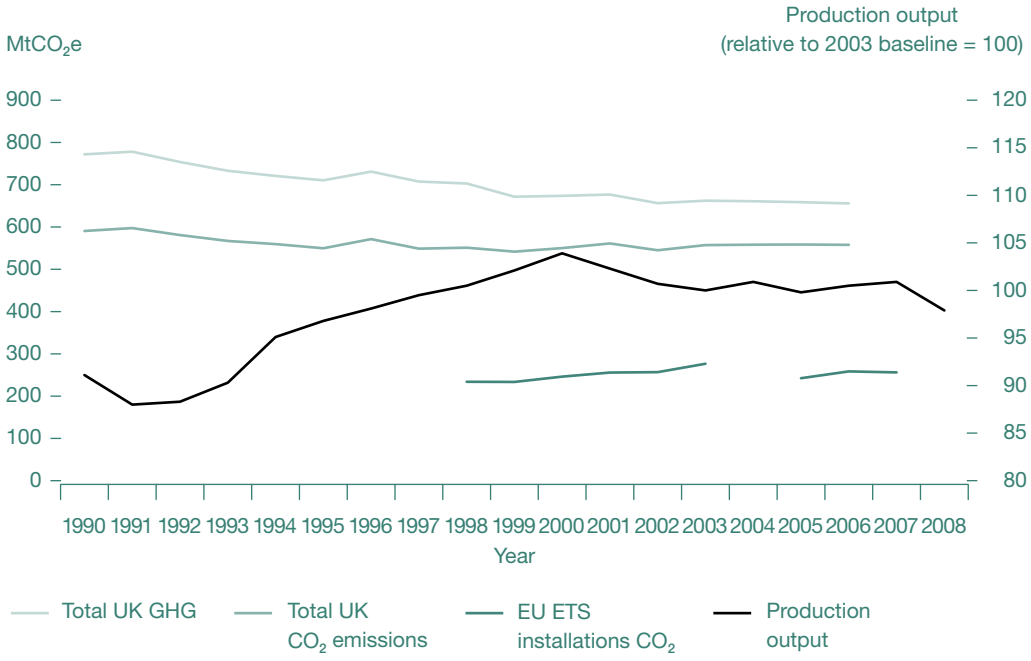
Figure 11
Total allocation and total emissions from EU Member States in Phase I



Source: Community Independent Transaction Log

Figure 12

UK greenhouse gas emissions and manufacturing production levels 1990-2008



Source: National Audit Office (Based on Phase I results, UK Greenhouse Gas Inventory – AEA Technology)

NOTE
There are no data on emissions from EU ETS installations in 2004 as this data was not collected for the Phase I baseline.

Figure 13

Annual emissions in Phase I

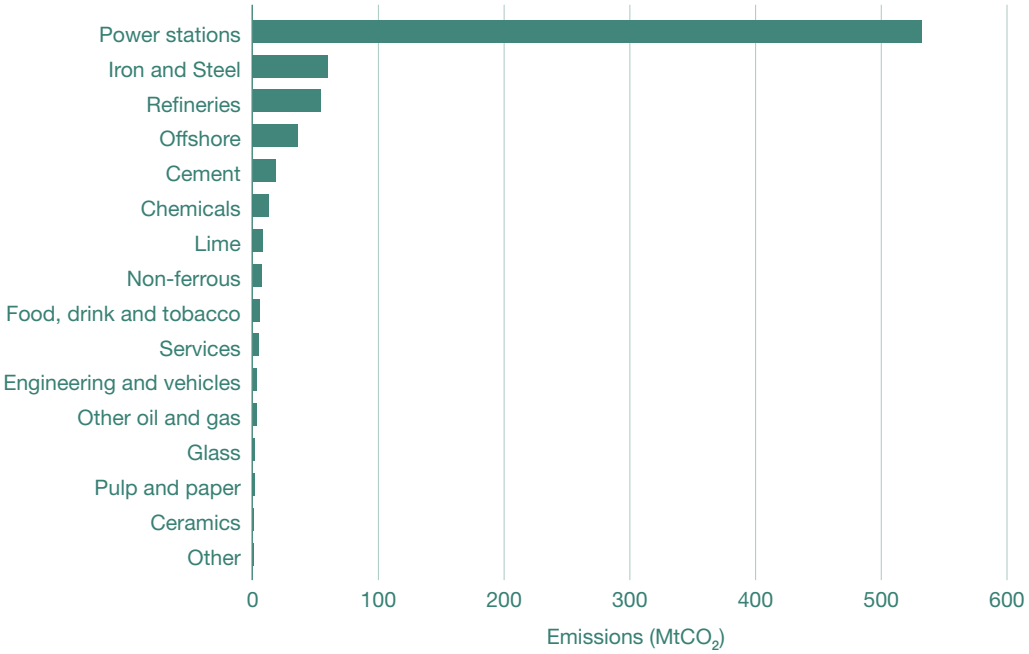
	2005	2006	2007	Phase I total
Power station verified emissions	172	181	178	532
All other sector verified emissions	71	70	78	218
Total verified UK emissions	**243**	**251**	**256**	**750**
Total UK allocation	**215**	**218**	**229**	**662**

Source: Defra

NOTE
The increase in 'other sector' emissions in 2007 was a result of additional installations from UK ETS, responsible for 9.2 $MtCO_2$ of emissions, entering the EU ETS.

3.8 In the UK, the power sector accounts for 71 per cent of UK emissions covered by the Scheme (Figure 13 and **Figure 14**). The rise from 2000 to 2003 in baseline emissions in the UK from sectors covered by the Scheme was due mainly to fuel switching in the power sector: falls in the relative price of coal against gas led to an unanticipated increase in its use by electricity generators.[24] The government decided that the power sector should be solely responsible for the 'effort' involved in delivering reductions below business as usual in Phase I partly because of the scope for the sector to reduce emissions substantially by switching back to gas. The introduction of the EU ETS in 2005 may have achieved this to some extent, as power sector emissions fell in 2005, but continuing high gas prices combined with the sudden fall in the price of EU ETS allowances lead to further fuel switching to coal in 2006 and an increase in emissions of 16 $MtCO_2$. Total EU ETS emissions in the UK in 2007 increased, but this was because installations responsible for emissions of 9.2 $MtCO_2$ entered the EU ETS for the first time from the UK ETS rather than any real increase in emissions. Taking this into account, actual emissions fell in 2007 as a result of a fall-back in power sector emissions (**Figure 15** overleaf).

Figure 14
Contribution of sectors to UK EU ETS emissions in Phase I



Source: Defra

24 EAC has commented on this unanticipated trend as early as 2003 in its report *Energy White Paper – Empowering Change?* Eighth Report of Session 2002-03.

Figure 15
Sector allocations and verified emissions in Phase I (2005-2007)

	Phase I allocation ($MtCO_2$)	Phase I emissions ($MtCO_2$)
Power stations	407	532
Iron and steel	68	60
Refineries	59	54
Offshore	43	36
Cement	20	18
Chemicals	17	13
Non-ferrous metals	9	7
Services	6	5
Other sectors (<5 $MtCO_2$)	23	25
Total UK ETS sectors	**662**	**750**

Source: Defra

NOTE
'Other sectors' comprises eight sectors, in each of which emissions were less than 5 $MtCO_2$ and were also less than allocations.

3.9 In total, verified Phase 1 emissions from EU ETS installations in the UK amounted to 750 $MtCO_2$, 13 per cent higher than total allocations. The business as usual forecast for Phase 1 was 802 $MtCO_2$, but this included an estimated 62 million tonnes of emissions relating to opted-out organisations. Taking account of this, outturn emissions were slightly in excess of the business as usual forecast for participating installations (740 $MtCO_2$). These figures suggest that Phase 1 may not have resulted in any reduction in emissions from UK installations participating in the ETS.

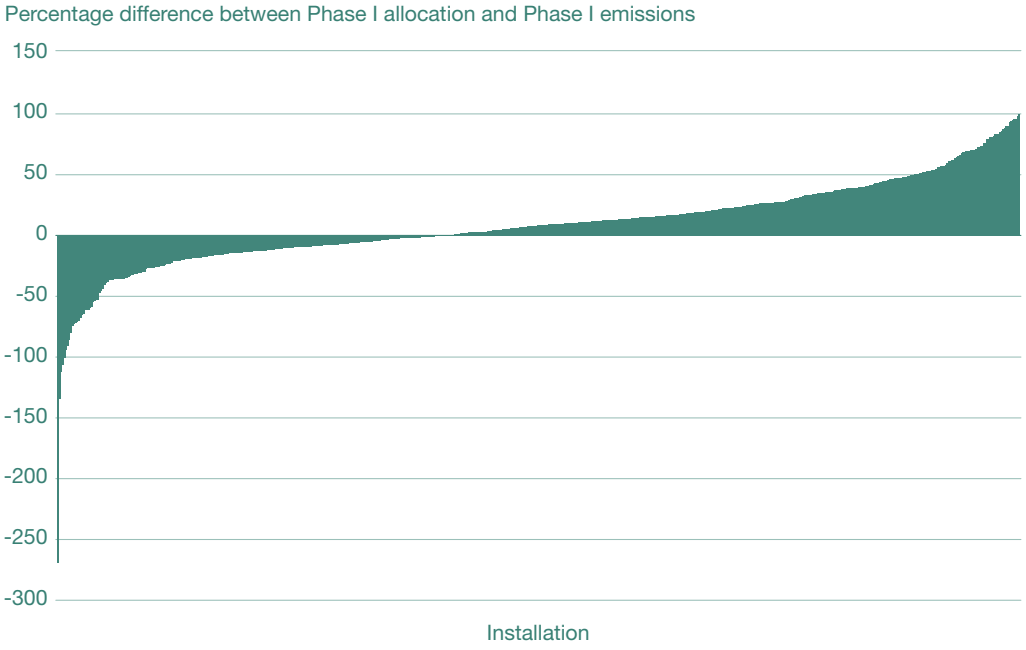
3.10 Although total verified emissions from all non-power sectors were nearly 15 per cent below allocations, and every sector was equal to or below its allocation, our analysis of site-level data showed that the emissions from individual installations in these sectors varied hugely in relation to their allocations. Up to 40 per cent of UK sites in non-power sectors had emissions that were higher than their allocation (**Figure 16**). So even though the sector as a whole had sufficient allowances, individual installations nevertheless had to obtain more allowances to cover their emissions. This indicates that the EU ETS may have more influence on companies' behaviour than sectoral data might suggest, as a significant number of installations have had to buy allowances or transfer allowances internally for compliance purposes.

3.11 In this respect, UK experience was significantly different from that in other Member States. For example, only five per cent of Lithuanian installations had higher Phase I emissions than the allocation providing strong evidence of across the board over allocation in Lithuania. The German allocation plan led to 71 per cent of installations receiving more allowances than emissions in Phase I.[25]

25 Community Independent Transaction Log. Available at http://ec.europa.eu/environment/ets/.

Figure 16

Difference between allocation and emissions in non-power sector installations in Phase I



Source: National Audit Office analysis of data from the Community Independent Transaction Log

NOTE
The graph shows that a substantial number of installations (those on the left hand side of the figure) did not have sufficient allowances to cover their emissions. The cost involved in making up for such shortfalls can potentially be substantial. At January 2009 prices for Phase II allowances, for example, it would cost £3 million to make up for a shortfall of 300 thousand tonnes of carbon. In absolute terms, the variance ranged from -350 to 1545 thousand tonnes of carbon dioxide.

3.12 Our survey also provided some support for these findings. We asked respondents to our survey to identify the reasons for the differences between Phase I allocation and verified emissions at the company level.

- Nearly half of respondents stated that their emissions were lower than allocations, with the obvious exception of the power sector. However, in only three instances did companies state that this was because their Phase I allocations were higher than base line emissions. Decreasing output was the most common cause of the difference between allocations and emissions.
- Approximately 33 per cent of companies responding to our survey stated that their Phase I emissions were higher than their allocations. These companies were spread across all surveyed sectors, not just the power sector, and this is broadly in line with the spread of over and under-allocations in the above figure.

These findings may partly reflect the difficulty of accurately allocating allowances on the basis of historical emissions, as the operational performance of an installation can alter within a few years for various reasons. However, these difficulties do not reduce the environmental effectiveness of the Scheme, though they do affect which installations might benefit most.

Phase II of the EU ETS may also not result in significant emission reductions

3.13 In recognition of the fact that allowances had been over-allocated in Phase I, in 2006 the European Commission imposed more stringent reductions on Phase II National Allocation Plans submitted by Member States, taking into account Member States' performance against their Kyoto targets.

3.14 UK figures for verified emissions in 2008 will not become available until April 2009. In anticipation of the release of this data, we asked companies responding to our October 2008 survey to predict whether their emissions would be higher, lower or the same as their 2008 allocations. Forty per cent of respondents believed their emissions would be higher than their allocation. This was an increase on the 34 per cent of companies who reported higher emissions than their Phase I allocation, and provided some limited evidence that companies viewed Phase II as more challenging.

3.15 However, the survey was carried out in October 2008 before the full extent of the economic downturn had been appreciated. These predictions should therefore be viewed with caution as companies' emissions are likely to have changed substantially. The current recession is likely to lead to fewer emissions as production of energy-intensive products decreases, and across the EU is likely to result in emissions in Phase II being lower than the total EU cap. The impact of the recession may dwarf any reductions which the EU ETS would otherwise have achieved. The decision to allow Phase II allowances and project credits to be carried forward to Phase III may help to prevent a repetition of the collapse in the market for allowances in Phase I, though it may have a consequent impact on the environmental effectiveness of the Phase III cap.

3.16 The April 2009 compliance data for 2008 will give an early indication of how companies are responding to the EU ETS in Phase II. However, the NAO has previously pointed out that, where UK installations present more allowances than they have been allocated, it may not be possible to analyse fully the nature of any additional allowances presented – to distinguish, for example, between allowances borrowed from the following year and allowances purchased from other Member States. Indeed, at present, the full impact of the EU ETS can only fully be assessed at the end of each Phase. These issues are covered in greater detail in the NAO's 2008 briefing to the Committee on the measurement and reporting of greenhouse gas emissions.[26]

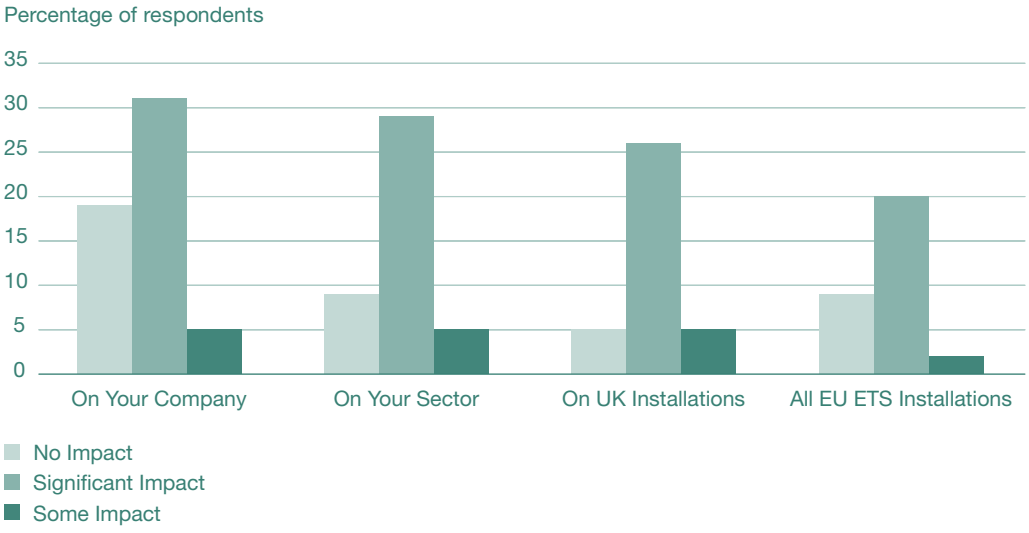
26 National Audit Office (2008) *UK greenhouse gas emissions: measurement and reporting.*

Emissions trading has influenced behaviour

3.17 The Environmental Audit Committee has previously commended the EU ETS for the successful development of a functioning market for carbon. Our October 2008 industry survey confirmed that the market was functioning: 82 per cent of respondents had traded carbon allowances, mostly to ensure compliance with the rules of the Scheme (that is, to surrender enough allowances to cover all verified emissions in a given year).

3.18 We asked our survey respondents to identify how they believe the EU ETS is influencing the behaviour of companies, sectors, the UK and the EU. Many respondents felt they were not in a position to comment on the impact of the EU ETS outside of the UK, but 40 per cent considered it had had some or significant impact. While 34 per cent believed the EU ETS had not had any impact on their company's emissions, 64 per cent considered it had, including nine per cent who considered it had had a significant impact on their company's emissions (**Figure 17**).

Figure 17
Industry perception of the impact of the EU ETS on emissions

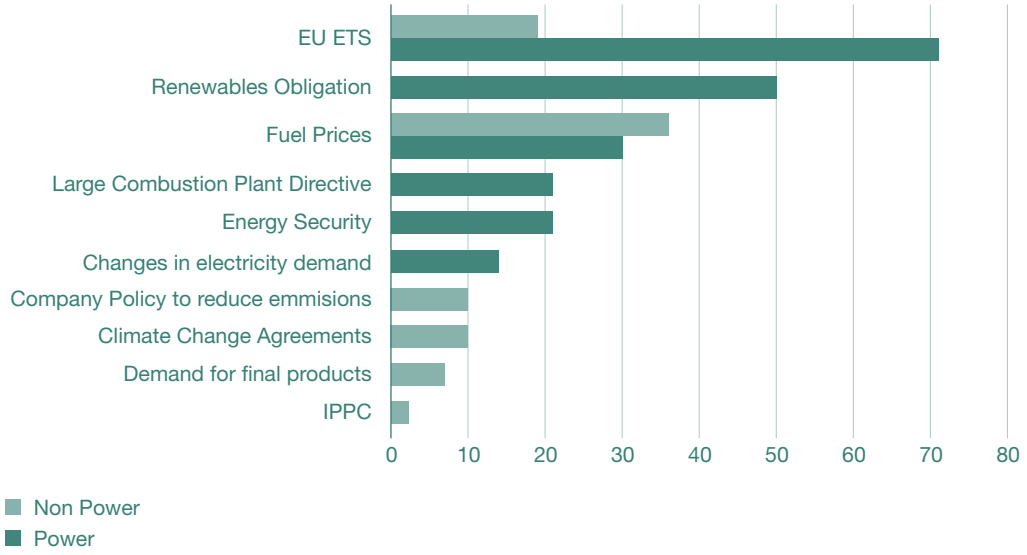


Source: National Audit Office

3.19 Companies also reported that trading has had some impact on board-level consideration of carbon abatement. Around 32 per cent of companies responded that the one of the key benefits of the EU ETS was that it had increased the importance of CO_2 emissions and energy efficiency at the board-level. This was particularly the case in the power sector where respondents rated the EU ETS as the key driver affecting long term emissions and energy-consumption levels (**Figure 18**) and power sector respondents provided seven examples of implemented investments to reduce CO_2 emissions (**Figure 19**). We found that 20 per cent of respondents in other sectors considered the EU ETS was as important and that there were other factors that have a greater impact on their company's emissions and energy consumption such as fuel price.[27]

Figure 18

Drivers affecting emissions and energy consumption in the power sector and non-power sectors



Source: National Audit Office

NOTE
The figures in this chart are for illustrative purposes only and are not necessarily correct.

27 Very few survey respondents indicated that the economic down turn was a key factor, though this may be due to the timing of our survey (October 2008). Some companies may not have been aware of the full extent of the economic downturn.

Figure 19

Evidence of investment for emissions abatement within the sectors examined for this study

Responding companies provided the following examples of implemented, approved or planned investments to reduce carbon dioxide emissions.

Sector	Types of Implemented Investments	Types of Approved Investments (about to be implemented)	Types of Planned Investments
Cement	Three fuel switching investments leading to annual CO_2 reductions of 2.5 per cent to 15 per cent and with a capital cost of between £2.5 million and £25 million.	None reported.	None reported.
CHP/Other combustion	Six installations mention a range of energy efficiency investments with capital costs between £0.6 million and £10.6 million.	One energy efficiency project with costs around £50,000 and CO_2 savings of approximately three per cent.	Three energy efficiency projects.
Iron and steel	One energy efficiency project that will primarily lead to a reduction in electricity consumption and not direct CO_2 emissions.	Two energy efficiency projects embedded in process change with total cost of over £50 million and one per cent annual CO_2 emissions reductions.	One renewable energy project and energy efficiency projects.
Large electricity producers	Seven energy efficiency and fuel switching projects, including biomass, with costs ranging from £29 million to over £100 million and emissions reductions between 0.7 per cent and 12.5 per cent.	Numerous examples of core business decisions in new plant affected by the EU ETS, including investments in renewable, gas-fired and nuclear power station capacity.	Investments in renewable and nuclear capacity and carbon capture and storage.
Offshore	Three companies mention a range of energy efficiency and flaring reduction projects with costs ranging from £0.25 million to £34 million and annual emissions reductions between five per cent and 12 per cent.	Three energy efficiency investments with costs between £77,000 and £0.5 million and annual emissions reductions between 0.5 million and one $MtCO_2$.	Energy efficiency and reduced flaring projects.
Refineries	One energy efficiency project with a capital cost of £0.75 million and emissions savings of five per cent.	None reported.	Fuel switching and introduction of CHP generation, energy efficiency.

Source: National Audit Office

3.20 At the strategic company level, 56 per cent of survey respondents reported that EU ETS allowance prices are included in core business decisions. Interviews suggested that most companies now include carbon price projections in investment analysis along with all other costs and benefits of a project. The timeframe over which such costs are considered varied from three years in some refinery and offshore companies to over 20 years in the electricity sector. Over 90 per cent of respondents to our survey had considered specific emissions abatement investments, and companies within all six sectors identified projects that were partly incentivised by the EU ETS (Figure 19). The high incidence of energy efficiency and fuel switching projects among those cited also points to the fact that companies are choosing least-cost abatement options first. However, the large rise in energy prices from 2004 to 2008 has had a major impact on the economy, and in that context it is difficult to assess to what extent the EU ETS has influenced such investments.

3.21 However, many respondents reported difficulty in incorporating carbon prices from 2013 onwards due to the extent of policy uncertainty, and other economic factors could be more important for certain sectors. For example, the iron and steel sector noted that the economic downturn and long-term policy uncertainty relating to EU ETS were more important than the cost of EU ETS allowances when making investment decisions. Other research suggests long-term uncertainty, price volatility, limited trading periods and the lack of synchronisation of the EU ETS with investment timescales of industry all hinder emission abatement investment decisions.[28] However since this research was completed the negotiations for the revised EU ETS for post-2012 have been completed addressing some of these uncertainties as discussed in Part 4.

3.22 These results suggest that while the EU ETS may have influenced some investment decisions, the extent to which it is affecting longer-term strategic thinking is less clear. In our survey, we asked whether companies were planning to carry forward surplus allowances for use in subsequent years, including Phase III (banking), or to borrow from next year's allocation to meet compliance requirements. Only two out of 56 companies reported that they would bank allowances, and only ten said they would borrow. This suggests that companies are still not actively managing their carbon emissions on a long-term basis, though it may also reflect a combination of policy uncertainty and the impact of the economic downturn.

The price of allowances is insufficient to stimulate major investment in low carbon technologies

3.23 One of the fundamental principals behind emissions trading is that the scarcity of allowances will result in a high and stable carbon price which will in turn incentivise long-term investment in low carbon technologies such as offshore wind, carbon capture and storage, biomass, and nuclear.[29]

28 Grubb & Neuhoff (2006) Allocation and competitiveness in the EU Emissions Trading Scheme: Policy overview, *Climate Policy*, 6, (4), pp. 7-30.
29 Ibid. Grubb & Neuhoff (2006).

3.24 The Phase I allowance price developed robustly in the first 16 months of the EU ETS and, despite a certain degree of volatility, peaked at €29.75 in April 2006.[30] The price peak was partly due to high and rising natural gas prices, combined with unusual climatic conditions which created additional demand for air conditioning and heating.[31] It was also due to some uncertainty about the extent to which the market might be over or under-allocated which led to some defensive buying of allowances as a precaution against possible future price rises. However, the release of verified emissions data for 2005 in April 2006 resulted in an immediate price crash. There was a partial recovery for several months, but when the extent of over-allocation for Phase I as a whole became clear the price of allowances fell to nearly zero.

3.25 Phase II allowances constitute a distinct market, and future trading in it began in mid-2005. For some time, Phase II allowances traded at a price of €25-28 per tonne CO_2 (**Figure 20**). But from a high in July 2008 the price has been falling to around €11 per tonne CO_2 in March 2009, reflecting the current economic downturn, concerns about the weakness of the Scheme, and the ready availability of allowances.[32] Phase II allowances are now trading at the same price as project credits.[33]

Figure 20
Phase II allowance price development since January 2008

Source: European Energy Exchange

NOTE
Data based on 2009 prices for EU ETS allowances and on Certified Emission Reduction trading prices.

30 European Energy Exchange (2008).
31 Pew Center on Global Climate Change (2008) *The European Union's Emissions Trading System in Perspective*.
32 European Energy Exchange (2008).
33 Project credit prices cannot remain above EUAs because as the CER price rises above the EUA price, this will choke off all EU ETS demand for CERs and result in most installations holding CERs to swap them back for EUAs. This in itself would, at the very least, cause price equalisation and push EUAs back to a small premium.

3.26 It is unclear what further impact the current economic downturn will have on EU ETS allowance prices. Changes to the EU ETS agreed in 2008 which allow Phase II allowances to be carried forward to Phase III may prevent further falls, and there are some grounds for thinking that carbon prices are now being underpinned by a Chinese tax on project credits.[34] The current level for EU allowances is considerably below the levels anticipated for Phase II, and significantly lower than the level required to incentivise major investments in low carbon technologies.[35] In 2008 a study by McKinsey found that demonstration carbon capture and storage projects would cost in the region of €60 and €90 per tonne CO_2 abated between 2012 and 2015. The figures suggest that the current EU ETS allowance price of €11 will not provide a sufficient financial incentive to invest in renewable technologies, though it may still influence decisions in combination with other policy instruments and economic drivers.

3.27 Further evidence that confidence in carbon trading is insufficient to stimulate significant investment in new technologies is provided by the fact that medium and longer-term secondary markets in allowances have failed to develop. Future trades are mainly confined to the next one to two years, and the volume of deals beyond that point drops away so sharply that there is effectively no functioning market.

There is little evidence of any effect on the competitiveness of UK companies

3.28 Trade organisations have often voiced concerns about the impact of the EU ETS on industry. While the low trading price seen in Phase I is unlikely to have created an incentive for companies to relocate operations overseas ('carbon leakage') or not invest in existing UK plants as much as they would otherwise have done, the potential for carbon prices to rise in Phases II and III might have this effect.

3.29 Our October 2008 industry survey identified some negative impacts of the EU ETS on industry, but these related mainly to the administrative costs of compliance. We received mixed responses on the wider issue of the impacts on international competitiveness. Most sectors suggested that the Scheme had had little impact. By contrast, the iron and steel and the refineries sectors reported that some activities had been shifted to other EU Member States or relocated outside the EU. These sectors also suggested, however, that the Scheme had had little impact on corporate decision making and that the economic downturn was a more pressing issue at the board table. It is therefore difficult to attribute such relocations directly to the EU ETS, particularly given the continuing low prices of carbon allowances and the high levels of allowances that were allocated for free in Phases I and II.[36]

34 The Chinese government applies a tax on the sale of CERs arising from CDM projects in China. The tax rate varies according to the greenhouse gas involved in the project. The highest tax rate (65 per cent of the CER value) is applied to gases with higher global warming impact (e.g. HFCs and PFCs). Only two per cent tax is applied to CERs generated from projects to reduce CO_2. As China hosts more than 24 per cent of the global CDM projects the tax underpins the value of CERs generated in other developing countries. Lehman Law (2008) *Clean Development Mechanisms Projects in China: a brief guide.* Available at http://www.lehmanlaw.com/fileadmin/lehmanlaw_com/Publications/clean_development_mechanism_projects_in_china-a_brief_guide.pdf [accessed 09/02/09].

35 National Audit Office (2008) *Renewable energy: Options for scrutiny.*

36 As the EU is a single market and the EU ETS an EU-wide scheme, it would not be expected to result in intra-EU re-locations, though differences in implementation of the Scheme between Member States in Phases I and II could possibly have a small effect.

3.30 More generally, the impact of the EU ETS on competitiveness needs to be seen in the wider context of the decline in UK manufacturing output since 2000 (Figure 12). If the current economic climate continues or accelerates this trend this could lead to a considerable surplus of allowances in Phase II, as allocations were based on growth assumptions which no longer obtain. Such surpluses can be banked for use in Phase III and would reduce the quantity and price of allowances companies would need to buy from the market.

3.31 By contrast to concerns about competitiveness, there have also been suggestions that the allocation of free allowances has resulted in increased prices and windfall profits within some sectors. In 2007 the Committee identified the potential for power generators to make windfall profits as a result of the EU ETS. In the UK the government assumed in its sector allocations that the power sector would pass on the full costs of the EU ETS (the cost of allowances and administrative costs) for all emissions included in the Scheme despite receiving allowances free of charge from the government for at least a proportion of these emissions. A report by the Carbon Trust in 2006 found that in 2005 UK power generators made over €1 billion as a result of passing through the opportunity costs of EU ETS participation. The 2008 Point Carbon study carried out for WWF suggested that windfall profits for UK power companies might amount to €6-10 billion in Phase II.[37] Ofgem has also calculated that UK power companies would gain from windfall profits in the region of £9 billion in Phase II due to the distribution of allowances for free.[38]

3.32 Estimates of windfall profits involve theoretical calculations based on the market price of carbon allowances and the assumption that the full cost is passed on to the consumer. In practice, industrial and domestic tariffs have changed significantly in recent years. The factors influencing these changes are complex and include the contractual relationships between generators and suppliers, competition among suppliers in providing competitive tariffs, and very large changes in the price of some fossil fuels. It is difficult to obtain robust evidence on the factors affecting prices because much of the data is commercially sensitive. Power sector respondents to our October 2008 industry survey also noted that increased profits would help the sector finance the technology shift needed to achieve the emissions reductions.

37 Carbon Trust (2006) *Allocation and competitiveness in the EU Emissions Trading System: Options for Phase II and beyond.*

38 Ofgem (2008) *Market is sound – Ofgem assures Chancellor*, Press Release Wednesday 16 January 2008. Available online at http://www.ofgem.gov.uk/Media/PressRel/Documents1/Ofgem%202.pdf [accessed 09/02/09]. Ofgem ruled out the possibility of collusive behaviour on the part of power companies to unilaterally increase energy prices as companies were assumed to have passed on the opportunity cost of EU ETS participation to consumers.

Other policy instruments will complement the EU ETS but increase burdens on industry

3.33 The EU ETS is the government's main policy instrument for reducing emissions in the industrial sector. However, energy policy is a particularly complex area, and there are a number of major policy instruments which apply to all or some installations participating in the EU ETS (**Figure 21**). Some of these instruments also aim to address climate change mitigation – for example, by promoting renewable energy or energy efficiency; while others have different objectives such as reducing sulphur pollution.

3.34 In our October 2008 industry survey and interviews, operators highlighted two key policy interactions which increased the administrative burden on installations:

- The EU ETS and the Climate Change Agreements have slightly different monitoring requirements relating to the measurement of calorific values. Companies also reported the need to incorporate complex methodologies in their Climate Change Agreements calculations to prevent emission reductions being claimed for twice. There may be an opportunity to harmonise monitoring procedures when the detailed structure of the Climate Change Agreements scheme after 2012 is determined.
- The EU ETS and the forthcoming Carbon Reduction Commitment cover installations of different sizes but respondents were concerned that installations exempt from the Carbon Reduction Commitment might still be required to carry out additional reporting to prove their status rather than gain automatic exemption.

3.35 Our survey respondents also highlighted trade-offs between achieving other policy or economic goals and reducing carbon emissions under the EU ETS:

- The Iron & Steel industry noted that the policy drive for more energy efficient cars encourages manufacturers to use lighter parts, yet the technical processes involved increase the carbon intensity of the final product. Similarly, the increasing use of alloys of steel and aluminium might lead to increased demand for future steelmaking as these materials cannot be recycled so easily.
- The refinery sector noted that low-sulphur content fuel (as required by EU and international policies on road transport and shipping) requires more processing/ energy input and hence potentially leads to greater CO_2 emissions.
- Some respondents and interviewees also cited a potential negative interaction with the Waste Incineration Directive, suggesting that the Directive reduces operators' ability to burn biofuels such as tallow and also leads to protracted trials, consultation, and approval routines for the use of renewable fuels as an alternative to fuels which produce carbon emissions.

Figure 21
Interactions with other policy instruments

Installations responding to our survey were asked to pick from a list of policy instruments those that apply to them. The following table summarises the results in relation to the six sectors we surveyed.

Policy instrument	Description	Surveyed sectors most affected
Climate Change Levy	A downstream tax on the business use of energy, with exemptions for new renewable sources of energy. Rebates from the tax are also available to those sectors which have concluded Climate Change Agreements with the government.	All sectors.
Climate Change Agreements	Formal agreements which have been negotiated by over 40 industrial sectors, under which they are entitled to an 80 per cent rebate from the CCL provided they meet specific energy efficiency or emission reduction targets.	All sectors.
Integrated Pollution Prevention and Control Directive	A European Directive which regulates all types of emissions from industrial plant by reference to the 'best available technologies'. Installations have to agree targets which are subsequently monitored by independent inspectors.	All sectors.
Large Combustion Plant Directive	A European Directive aimed at reducing sulphur emissions and preventing 'acid rain'. Industrial plants which do not comply with the limits set by the Directive, must either fit desulphurising equipment or reduce their operational hours and finally close by 2016.	Mainly the power sector, refineries, and offshore.
Renewables Obligation	A UK policy instrument which obliges electricity suppliers to obtain an annually increasing percentage of the electricity they sell from renewable sources. They demonstrate compliance by buying Renewable Obligation Certificates either directly from renewable generators (to whom such certificates are issued) or from the markets within which such certificates are traded.	Most sectors except Offshore and CHP.
Waste Incineration Directive	A European Directive designed to limit or prevent emissions and associated impacts on human health arising from the incineration of waste.	Mainly the cement and power sectors.
Carbon Reduction Commitment	A UK policy instrument, to be introduced from 2010, which will require all medium-sized businesses above a certain threshold to participate in an emissions reduction scheme.	Mainly the power, CHP, and refinery sectors.

Source: National Audit Office

3.36 There was, nevertheless, a widespread recognition among the companies we surveyed that there were also synergies between these various policy instruments. The Integrated Pollution Prevention and Control Directive required installations to carry out an energy efficiency survey and identify possible efficiency measures, and the EU ETS enhanced the economic case for such measures by putting a value on carbon. The electricity sector also highlighted the positive overlap between the EU ETS, renewable energy policy, and other policy instruments. In particular, they pointed out that the Large Combustion Plant and Integrated Pollution Prevention and Control Directives also incentivised a shift away from coal-fired power stations as they required electricity producers to use additional fuel to run sulphur abatement technology, thus increasing the cost of buying carbon emission allowances under the EU ETS. Proposals to allow carbon capture and storage into the EU ETS will reinforce the Large Combustion Plant Directive, as the capture of CO_2 will also require sulphur and nitrogen oxide emissions to be filtered off.

Part Four

The development of Phase III

Introduction

4.1 This part of the report examines proposals to extend the EU ETS to cover the period 2013 to 2020 (Phase III). It sets out how these proposals were developed, the extent to which they address existing weaknesses in the Scheme, and the key changes which will result. The topics covered are:

- the development of the proposals for Phase III of the Scheme;
- key changes in Phase III;
- the allocation of allowances and auctioning;
- the use of project credits;
- the inclusion of aviation; and
- remaining uncertainties over the operation of the Scheme in Phase III.

The EU objective in further developing the Scheme was to increase its impact and to support its international negotiations for a successor agreement to the Kyoto Protocol

4.2 The development of proposals for Phase III began in November 2006, when the European Commission issued a Communication in which it identified the main subjects to be reviewed.[39] These were grouped into four main areas – the scope of the Directive, further harmonisation, robust compliance, and linkages with other trading schemes. In early 2007, the European Council emphasised the EU commitment to transforming Europe into a highly energy efficient and low greenhouse-gas-emitting economy, and called on the Commission to "bring forward proposals which create the right incentives for forward-looking, low-carbon investment decisions". It also reaffirmed that developed countries should, by 2050, collectively reduce their emissions by between 60 per cent and 80 per cent; and established an EU objective of a 30 per cent reduction in greenhouse gas emissions by 2020 provided that other developed countries committed themselves to comparable emission reductions, and a 20 per cent reduction irrespective of any international agreement.[40]

39 COM(2006) 676, *Building a global carbon market – Report pursuant to Article 30 of Directive 2003/87/EC*, 13 November 2006.

40 European Council (2007) *Review of the European Union Emissions Trading Scheme – Council Conclusions* (26 June 2007). Available at http://register.consilium.europa.eu/pdf/en/07/st11/st11429.en07.pdf.

4.3 In January 2008, the European Commission published its proposals for Phase III of the EU ETS in the form of a draft Directive, aiming to:

- fully exploit the potential of the Scheme to contribute to the EU's overall greenhouse gas reduction commitments in an economically efficient manner;
- refine and improve the Scheme in the light of experience gathered; and
- contribute to transforming Europe into a low greenhouse-gas-emitting economy and create the right incentives for forward looking low carbon investment decisions by reinforcing a clear, undistorted and long-term carbon price signal.

These proposals were published as part of a major policy initiative, the Climate and Energy Package, which included other important draft Directives on renewable energy and on the emissions reductions Member States must achieve in the non-traded sectors. The EU took forward proposals for including aviation within the EU ETS separately, resulting in the adoption of a separate Directive on this topic in November 2008.[41]

4.4 Following the publication of the draft EU ETS Directive, extensive consultation and discussion took place during 2008 – both within individual Member States and between Member States, the European Parliament and the European Commission. The UK government issued three relevant consultations – on the amendments to the EU ETS from 2013 (the Phase III proposals), on the Renewable Energy Strategy, and on carbon capture and storage.[42] In November 2008, the UK government published its formal response on the EU ETS, in which it positively supported most aspects of the draft Directive.[43] Following detailed consideration by the Energy and Climate Change Committee of the European Parliament, in December 2008 EU Heads of State negotiated and agreed amendments to the proposals, and the revised Directive was ratified by the European Parliament in December 2008.

4.5 The European Union sought agreement on its Phase III proposals by the end of 2008 to support its negotiating position leading up to the meeting of the Conference of the Parties to the UN Framework Convention on Climate Change in Copenhagen in late 2009, at which it is hoped that a post-2012 agreement for emission reductions can be reached, as a successor to the Kyoto Protocol. The EU made some important aspects of the Phase III Directive dependent on the outcome of these international negotiations, and these will be agreed through the co-decision process. More detailed aspects of implementation will be agreed through comitology processes from 2009 to 2011.[44]

41 Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation in the scheme for greenhouse gas emission allowance trading within the Community.

42 Defra (2008) *Consultation on proposed EU Emissions Trading System from 2013*; BERR (2008) *UK Renewable Energy Strategy Consultation*; and BERR (2008) *Towards Carbon Capture and Storage Consultation*.

43 DECC (2008) *Government's Response to Consultation on Commission's proposals to amend the EU Emissions Trading Scheme from 2013.*

44 The latter include, for example, deciding which sectors are at risk of leakage and harmonising measures for allocating allowances.

The Phase III Directive introduces many significant changes to the Scheme

4.6 The Environmental Audit Committee made various recommendations for changes in the EU ETS in Phase III. In particular, it called for:

- the introduction of a single EU-wide cap set in accordance with future carbon reduction targets in a robust and transparent way;
- greater use of auctioning;
- greater harmonisation in the application of the EU ETS among Member States (especially in relation to quantitative and qualitative limits in the use of project credits); and
- the maintenance of a robust approach with regard to the allocation of allowances for the aviation sector.

4.7 The Commission's Directive addressed many of these recommendations. **Figure 22** overleaf sets out the Commission's initial proposals and the agreed Directive. In advance of the finalisation of the Directive in December 2008, companies responding to our October 2008 industry survey raised a range of concerns about the Commission's proposals for reform of the Scheme, in particular relating to the auctioning of allowances and impacts on competitiveness and the way the Scheme might be linked to other trading schemes. A key concern for industry was the continuing uncertainty over the future operation of the Scheme. The following sections on changes in Phase III to the allocation and auctioning of allowances, the use of project credits, the inclusion of aviation and wider uncertainties set out their concerns more fully and discuss the implications of the changes.

Figure 22
Phase III proposals and the amended Directive

The following table sets out the key features of Phase III, comparing the original January 2008 proposals with the directive as finally agreed in December 2008.

Feature	January 2008 Proposal	December 2008 Directive
Cap	A single central cap, determined by the EU, and set to ensure a 21 per cent reduction in emissions below verified 2005 levels by 2020. This equates to an EU central cap of not more than 1720 $MtCO_2e$ in 2020. From 2013, the cap will decrease in a linear manner from average annual allocations in 2008-12 at a rate of 1.74 per cent a year. Beyond 2020, the cap will continue to decrease by at least 1.74 per cent a year. If an international agreement is concluded with other developed nations taking on sufficiently challenging reduction targets, the 2020 cap will be increased automatically to 30 per cent.	As proposed, except for the fact that any reduction in the cap following an international agreement will be subject to formal EU discussion and agreement through co-decision.
Banking and borrowing	Full banking between compliance years and phases; borrowing only from following year in same Phase.	As proposed.
Project credits	(a) **No international agreement:** exclusion of project credits in Phase III (except for project credits held at the end of 2012, project credits from projects established before 2013, and project credits from 2013 only in Least Developed Countries).	(a) **No international agreement:** phases II and III effectively merged. Member States may carry forward all their project credit Phase II allowance into Phase III. In Phase III an increase in access to CDM is allowed such that 50 per cent of effort can be met through CDM over the period 2008-2020. This amounts to 150 million tonnes of additional access in Phase III. Across the EU as a whole, this means that the total volume of project credits allowed for Phases II and III combined has been increased from the Phase II limit of around 1,400 million to around 1,600 million tonnes for the EU as a whole. The distribution mechanism for the additional access is based on installation level access to CDM in Phase II. Since UK installations had relatively low levels of access they are likely to receive a disproportionately high share of the additional access.
	(b) **'Comprehensive' agreement:** up to half the increase in the overall cap (i.e. half of the increase from 20 per cent to 30 per cent) can be met by increased use of offsetting.	(b) **'Comprehensive' agreement:** subject to a new co-decision process.
Auctioning	100 per cent auctioning for electricity generators throughout Europe from 2013.	In states where over a third of power is produced from coal and income per capita is less than half EU average, power sector to receive free EUAs for 70 per cent of their average 2005-07 emissions in 2013, decreasing to zero by 2020. Otherwise as proposed.
	20 per cent auctioning for all other sectors in 2013, rising to 100 per cent in 2020.	20 per cent auctioning for all other sectors in 2013, rising to 70 per cent by 2020, with free permits phased out by 2027.

Auctioning – "leakage"	Sectors at risk of carbon leakage to be identified by June 2010 and to receive free allowances (subject to five yearly review).	Sectors to be defined as at risk of carbon leakage if they face a five per cent increase in their costs (as a proportion of Gross Value Added), and if the value of exports and imports divided by turnover and imports exceeds ten per cent (or if either one of these criteria exceeds 30 per cent). Installations in all those sectors will receive 100 per cent free allowances to the extent that they use the most efficient technology. These sectors to be identified by 31 December 2009.
Distribution of auction rights	90 per cent of total allowances for auction to be distributed between Member States according to relative share of 2005 EU ETS emissions. Remaining ten per cent to be redistributed away from Member States where per capita income is more than 20 per cent above EU average (except where the whole climate and energy package is estimated to exceed 0.7 per cent of GDP).	Figure of 90 per cent to be reduced to 88 per cent, and a further two per cent to be redistributed through specific criteria (which, in practice, limit eligibility to east European states).
New entrant reserve	Five per cent of the total quantity of allowances will be put into a new entrants reserve.	As proposed, but with the provision that 300 million allowances from the New Entrant Reserve will be allocated to 12 Carbon Capture and Storage projects and to some renewables projects.
Earmarking auction revenues	Member States encouraged to earmark at least 20 per cent of revenues from auctioning.	Suggested level of earmark to be raised to 50 per cent. EU Member States made non-legally binding commitments to spend at least half of the revenues from auctioning or the equivalent to tackle climate change both in the EU and in developing countries.
Administration	Centrally governed rules for defining eligibility, for allocating allowances to sectors and installations through benchmarks, and for managing closures/new entrants. Creation of a single centralised registry.	As proposed.
Linking to other schemes	Linking by 'non-binding agreements' to any trading scheme in third countries (national or regional) with mandatory trading systems and absolute emissions caps.	As proposed.
Exclusion of small emitters	Application of a de minimis rule to exclude small installations where emissions are less than 10,000 tonnes of CO_2 a year, and where installations carry out combustion activities below a threshold of 25MW for rated thermal input.	Increase in threshold to 25,000 tonnes a year, and where installations carry out combustion activities a threshold of 35MW for rated thermal input.
Extension to additional sectors and gases	Non-CO_2 greenhouse gases from certain processes or activities to be included. Aviation to be included from 2012, but subject to the issue of special allowances (Aviation EUAs)[1] and capped at 97 per cent of the sectors' average emissions over the period 2004-06 for 2012 and 95 per cent from 2013. For other sectors, EU ETS to be extended only to emissions which are capable of being monitored, reported and verified with the same level of accuracy as currently applies. Shipping identified as a possible sector.	As proposed.

NOTE

1 AEUAs cannot be bought by other sectors and used for compliance purposes, though the aviation sector may purchase ordinary EUAs. AEUAs will be allocated on a similar basis to non-power sectors (i.e. the percentage to be auctioned to steadily increase).

Phase III will involve significantly more auctioning of allowances

4.8 The Commission proposed that Phase III would involve 100 per cent auctioning of allowances to the power sector from the beginning of Phase III, 20 per cent auctioning for other sectors with the remaining free allowances phased out by 2020, and free allowances for sectors subject to international competition. Free allocations to industry would be based on benchmarking, where feasible.

4.9 Nearly three-quarters of the organisations interviewed as part of our 2008 industry survey had concerns with regards to the Phase III proposals for auctioning of allowances:

- Power sector respondents expressed concern that, although experience of auctioning in Phase II was extremely limited, it was proposed to shift to 100 per cent auctioning without any transitional phase; and that the first auctions for Phase III were not due to take place until late 2011, thus impeding their ability to conclude forward sale contracts (which generally ran for three years).
- Industrial sector respondents' concerns related primarily to competitiveness impacts. Multinational companies pointed out that installations in the EU compete for funding with those in non-EU locations and that the additional costs associated with buying allowances through auctions would put them at a disadvantage and would divert investment flows from the EU. Companies in the iron and steel and refinery sectors for whom electricity costs are significant might face higher prices for electricity if all power sector allowances are auctioned. Phase III proposals may therefore lead to decreased UK plant utilisation levels and associated imports of products from non-EU countries.
- The Combined Heat and Power sector's concern was that treating it as part of the power sector and requiring it to buy allowances at auction for 100 per cent of the emissions generated by electricity production may not give appropriate incentive to introduce new Combined Heat and Power generation. Alternatively Combined Heat and Power could be treated as a part of an industrial installation and would receive some of their allocation free.

4.10 The Commission proposals for auctioning were revised to allow for certain Member States to allocate up to 70 per cent of power sector allowances free of charge, with the percentage decreasing to zero by 2020; to extend the phasing out of free allowances to the industrial sectors to 2027; and to introduce explicit criteria for defining those sectors subject to international competition, which may mean that more sectors than originally envisaged might now be eligible for free allowances.

4.11 Following the revisions it is unclear how much of the total cap will be subject to auction.

- It is unclear how much of industry may be considered at risk of carbon leakage on the basis of the criteria now defined, and to what extent sectors might therefore be exempted from the need to buy even a percentage of their allowances through auctions. There have been some suggestions that up to 90 per cent of EU industry could receive free allocations in Phase III.[45] In addition, benchmarks for assigning free allocations have yet to be developed, and the commitment to move to an output-based approach may radically alter allocations to individual installations. All these factors increase the uncertainty surrounding the use of auctioning and the issuing of allowances in Phase III and make it more difficult for industry to plan ahead.
- For the power sector, the overall percentage auctioned will depend on the extent to which certain Member States allocate allowances free of charge.

The Commission has estimated that at least 50 per cent of all allowances issued in 2013 will be auctioned.[46] This will represent a significant increase in the overall level of auctioning compared with Phase II, although less than the Commission proposed which would have amounted to at least 60 per cent.[47] The continued use of free allocations continues to represent a financial subsidy to those sectors and Member States, though in theory it only reduces the Scheme's efficiency and not its environmental effectiveness.

4.12 The commitment to introduce EU rules for auctioning allowances in Phase III should help to eliminate any potential distortions which might have resulted from Member States adopting radically different approaches. The procedures will be developed through comitology.[48]

4.13 The Phase III proposals would extend the use of benchmarking to industrial sectors, though the benchmarks are still to be determined. Nearly a quarter of the organisations we interviewed suggested that benchmarking would be difficult due to the heterogeneity of the installations in their sectors. This could make it very difficult to arrive at an approach which achieves appropriate incentives and is equitable. Until the benchmarking approach is agreed there will continue to be uncertainty for industry.

The banking of Phase II allowances and the use of project credits in Phase III will significantly loosen the Phase III cap

4.14 The Commission has set the EU cap for Phase III in order to help achieve its overall objective of a 20 per cent reduction in total EU emissions by 2020 against the 1990 baseline. This corresponds to a reduction of 14 per cent against 2005 emissions. To achieve this, the Commission determined that EU ETS sectors should reduce

45 Reuters (2008) *Europe clinches deal to battle climate change.* Available at http://www.reuters.com/article/environmentNews/idUSTRE4BB36720081212?pageNumber=1&virtualBrandChannel=10339.

46 European Commission (2008) *Climate change: Commission welcomes final adoption of Europe's climate and energy package.* 17 December 2008. Available at http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1998.

47 European Commission (2008) *Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System.* 23 January 2008. Available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/35.

48 Comitology is a procedure used by the European Commission to help implement legislation. It involves the creation of a committee made up of representatives from Member States and is chaired by the Commission. The procedure enables the Commission to engage with and take account of individual conditions within Member States prior to the implementation of policy measures.

emissions by 21 per cent, leaving ten per cent to be achieved by the rest of the economy. It therefore set a maximum cap in 2020 of 1,720 million allowances.[49] The caps from 2013 to 2020 were then calculated on the basis of a straight line trajectory from the 2010 mid-point allocation in Phase II, resulting in a reduction of 1.74 per cent per annum.[50]

4.15 The decision to allow banking of Phase II allowances for use in Phase III will loosen this cap. The Directive allows for the full banking of allowances between compliance years and between Phases. Phase II allocations were finalised in the context of forecasts for continued economic growth, and the sharp EU-wide economic downturn may therefore result in a surplus of allowances. While the decision to allow full banking of Phase II allowances may have helped to prevent a price crash similar to that experienced in Phase I, it also means that significant numbers of allowances could be carried forward into Phase III. This would reduce the effort required to comply with the annual cap and potentially reduce Phase III allowance prices.

4.16 The Commission initially proposed allowing installations to carry forward any unused portion of their project credit limit for Phase II into Phase III, and allowing no additional access in Phase III. However, the revised Directive increases the total volume of project credits by approximately 200 Mt. For existing installations, and excluding new sectors now brought within the scope of the Directive, this will allow power stations and industrial plants to use approximately 1,600 million credits over the period 2008-2020. In total project credits may be used for up to 50 per cent of the effort required to meet the EU-wide cap. Project credits could therefore account for a greater role than originally envisaged. Maximum use of them across Phases II and III could mean that the average reduction in EU emissions against the baseline is only seven per cent (**Figure 23**). It is largely because of this that many environmental organisations have heavily criticised the amended Directive, while at least one called for the European Parliament to reject parts of the legislation.

4.17 The extent of the reduction in EU emissions in 2020 against the 2005 verified emissions baseline will depend on the distribution in the use of project credits across Phases II and III (**Figure 24**). If, for example, project credits are used evenly across both Phases, then maximum emissions in the EU in 2020 will be 1,843 $MtCO_2$ and the 2020 reduction in emissions in that year will be 16 per cent. However, if the distribution in their use is back-loaded, the reduction might only be ten per cent. By contrast, were their use to be front-loaded and drop to zero by 2020, then the reduction would be 22 per cent. These figures do not take account of the possibility that substantial numbers of allowances might be carried forward from Phase II into Phase III. If this occurred, the scale of emissions reduction achieved by 2020 might be reduced.

49 The figures in this and the following paragraph are set out in EU MEMO/08/796 *Questions and Answers on the revised EU Emissions Trading System.* 17 December 2008. Available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/796&format=HTML&aged=0&language=EN&guiLanguage=en. The 2005 verified emissions baseline of 2,177 $MtCO_2$ used by the Commission does not include UK opted-out installations and therefore differs from the 2005 baseline used in Figure 23.

50 The 1.74 per cent relates to the 2010 mid-point allocation, not to reductions compared to the previous year. The 2013 cap is accordingly 5.2 per cent below the mid-point Phase II allocation. Note that the Commission's figure for the cap may be adjusted for changes in the scope of the scheme and for a variety of other reasons. See European Commission (2008) *Questions and Answers on the revised EU Emissions Trading System.* 17 December 2008. Page 6. Available at: http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/796&format=HTML&aged=0&language=EN&guiLanguage=en.

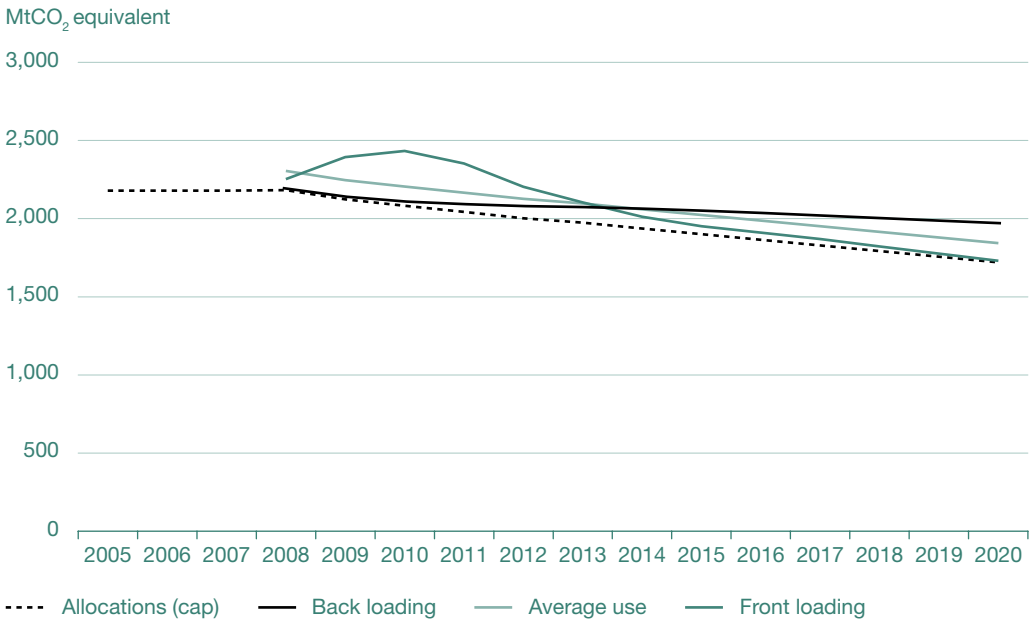
Figure 23
Allocations and the use of project credits in Phases II and III ($MtCO_2$)

Phase	Baseline (2005 verified emissions)[2]	Allocations (cap for whole phase)	Reduction against baseline (%)	Maximum project credits (over whole phase)	Maximum annual emissions	Minimum reduction in EU emissions against baseline (%)
Phase II	2,206	10,405	6	1,400	2,361	-7
Phase III	2,206	14,774	16	200	1,872	15
Phases II and III	**2,206**	**25,179**	**12**	**1,600**	**2,060**	**7**
2020 target	**2,206**	**1,720**	**22**	**n/a**	**Note 1**	**Note 1**

Source: National Audit Office/European Commission

NOTES
1 The allocation for 2020 would form the basis on which subsequent phases of the EU ETS might be negotiated. The maximum level of EU emissions in 2020, and the extent of reduction against the 2005 baseline, will depend on the distribution in the use of project credits across Phases II and III (see paragraph 4.17).
2 The 2005 baseline figure in the table above differs from the published EU figure of 2,177 $MtCO_2$ because it takes into account an estimated 30 $MtCO_2$ relating to UK opted-out installations. The EU will publish final allocation figures for Phase III by 20 September 2010.

Figure 24
Illustrative trajectories of EU ETS emissions to 2020 ($MtCO_2$)



Source: National Audit Office/European Commission

The graph shows how the use of project credits can allow emissions from EU installations to remain above annual allowance caps. It also shows three illustrative trajectories in the use of project credits – average use over both Phases, front-loading in which use of credits drops to zero by 2020, and back-loading in which increasing use is made of credits through Phases II and III. Other trajectories are possible. The scale of emission reductions achieved in 2020 will therefore depend on the distribution in the use of project credits.

NOTE
These trajectories and the reductions achieved in 2020 do not take account of allowances which might be carried forward from Phase II into Phase III.

4.18 The extensive use of project credits in Phase III would reduce the price of EU allowances and reduce the impact of the price on investment decisions. The Commission estimated prior to ratification of the Directive that extensive use of project credits in Phase III might result in allowance prices of €30 per tonne compared to €39 under other scenarios.[51] The use of project credits may, however, be affected by the outcome of international negotiations on the future of the Clean Development Mechanism.

Aviation will be included in the Scheme on a partially ring-fenced basis and with emissions capped below 2005 levels

4.19 The inclusion of aviation within the EU ETS has been taken forward through a separate process culminating in an amending Directive published in January 2009.[52] This provides for emissions for aviation to be included with effect from 2012. Key features of the directive include:

- The inclusion of all emissions relating to all international flights into and out of the EU, irrespective of the nationality of the operator, in the absence of an international agreement on the allocation of aviation emissions to national inventories. Aircraft operators will be responsible for complying with obligations under the Scheme.
- Centrally agreed procedures for allocating allowances. The allocation will be set with reference to average emissions in 2004-06 at a level of 97 per cent in 2012 and 95 per cent for 2013 to 2020. In 2012, 85 per cent of allowances will be issued free using an efficiency benchmark, while the rest will be auctioned. In 2013 onwards, 82 per cent will be issued free, 15 per cent auctioned, and three per cent of allowances will be set aside for a New Entrant Reserve. Airlines may, however, also offset their emissions up to a limit of 15 per cent of verified emissions through the use of project credits in 2012, and 1.5 per cent of verified emissions over 2013-2020.
- A special category of allowances to be allocated to the aviation sector. Airlines can submit aviation allowances and ordinary allowances to cover their emissions. However, the power sector and other industrial sectors within the Scheme cannot surrender aviation allowances to cover their emissions.

4.20 These provisions mean that the aviation scheme is effectively isolated from the main Scheme through a one-way filter. The overall aim is to protect the main trading market by preventing the possibility of aviation operators offloading their allowances in it. This could occur, for example, if aviation emissions are less than forecast or if international operators fail to comply with the scheme and sell their allowances on the market.[53] Because aviation operators can buy ordinary allowances, the tightness of the aviation cap and the forecast expansion of the sector may affect the market for ordinary allowances. This could impact on their price and on incentives to the power sector and industry to invest in emissions abatement and low carbon technologies.

51 Commission of the European Communities (2008) *Impact Assessment: Package of Implementation measures for the EU's objectives on climate change and renewable energy for 2020.*

52 Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community.

53 There have been threats of legal action against the EU by some groups, including the Air Transportation Group of America, who believe the inclusion of aviation contravenes international agreements on aviation. Available at http://www.greenaironline.com/news.php?viewStory=245 [accessed 09/03/09].

There remain uncertainties over the future operation of the EU ETS

4.21 Interview respondents in our October 2008 industry survey identified two further areas of uncertainty which affected their planning: the impact on the Scheme if an international agreement is reached in Copenhagen and the overall cap for the EU ETS is reduced to deliver a 30 per cent reduction by 2020; and the possibility of linking the EU ETS to other trading schemes.

- Interviewees from the iron & steel and cement trade associations were particularly concerned that the lower cap might be introduced before the impacts on their sectors had been properly assessed.
- Half of the interviewees were in favour of linking the EU ETS with other schemes and agreed that a global issue should be dealt with at a global level. They were concerned, however, that linking should be undertaken only with equivalently robust schemes, and that such schemes should be evaluated on a trial basis before being considered for linking with the EU ETS.

4.22 The Directive provides no specific criteria for assessing whether an international agreement at Copenhagen includes sufficiently challenging targets for other developed countries to justify the Commission increasing its own target and reducing the cap on emissions under the EU ETS. It does, however, state that other developed countries must commit themselves to comparable emission reductions and economically more advanced developing countries must contribute adequately according to their responsibilities and respective capabilities. It also requires the European Commission to submit a report within three months after the signature by the Community of an international agreement on climate change, which would assess the impacts and implications of such an agreement. If an agreement were concluded, the position of sectors exposed to carbon leakage, and therefore eligible for free allowances, would also have to be re-assessed.

4.23 The Directive sets out some conditions under which the EU ETS might link with other trading schemes. Other trading schemes must be mandatory, have absolute emission caps, and be compatible with that of the European Union, taking into account the level of environmental ambition and the presence of a robust and comparable emissions monitoring, reporting and verification mechanism and compliance system. The Directive is framed so as to include the possibility of linking with sub-national and regional schemes which may not have the power to conclude a legally binding agreement. It also provides for the possibility of allowing other forms of project credits in addition to those arising from the Kyoto mechanisms, the Clean Development Mechanism and Joint Implementation.

4.24 There also remains uncertainty for industry as a result of the very challenging EU target for renewables to account for 20 per cent of all energy consumption within the EU which is contained within the EU's Climate and Energy package. The target and other elements of the package are likely to require the introduction of additional policy instruments within Member States. As set out above, there may be interactions between these further measures and the EU ETS, and the further measures may themselves depress the price of allowances under the Scheme.

4.25 The range of uncertainties associated with Phase III means that no forward price for Phase III allowances has been established. It is through establishing a long-term stable carbon market with forward prices that the EU ETS should incentivise long-term investment in low carbon technologies. Until this is created the EU ETS is unlikely to be demonstrably achieving its objectives. It is possible that a stable Phase III allowance price might become established after various aspects of the Scheme's implementation have been clarified and international negotiations have been completed. Even then, however, further uncertainties relating to the review of aviation in 2014, the possible inclusion of other sectors (such as shipping), and the possibility of linking to other non-EU schemes remain. The absence of long-term carbon price signals has a particular effect on some key sectors, such as the power sector, because of the long asset lives associated with new investments.

Appendix One

Previous Environmental Audit Committee recommendations

Area	Committee recommendation/ conclusion	Government response
EU ETS within context of UK climate change policy	The government had more staked on the EU ETS delivering emission reductions than any other policy instrument.	The government was committed to building on the EU ETS as the main way of pricing carbon but also recognised the importance of other measures to encourage investment in new technology and behavioural change.
Overall effectiveness of the EU ETS in Phase I	The EU ETS in Phase I was an administrative success but its record in reducing carbon emissions was far less impressive. Phase I appeared to have very little impact on carbon emissions across the EU.	Emissions trading has not been used before on this scale. Phase I could be seen partly as a 'learning by doing' exercise.
Review of effectiveness of EU ETS in Phase I	The Committee had doubts as to the strengths of the conclusions in a study undertaken by Massachusetts Institute of Technology (MIT) which claimed that the EU ETS was driving significant emission reductions in the EU. It recommended that the government commission an independent review of the findings of the study.	The government drew attention to other evidence that the EU ETS was having an impact on industry behaviour, including a survey by Point Carbon in 2007 which found that two-thirds of 800 EU ETS participants stated they had implemented abatement projects as a result of the EU ETS.
The cap and quantity of allowances distributed by Member States	The Committee found that the effectiveness of the EU ETS was undermined by weak caps and inaccurate and unsatisfactory methods of allocating allowances to sectors and installations. This situation was exacerbated by the use of allocation methodologies that were cumbersome and prone to influence by industrial lobbying.	The government considered that the system used in Phase I was not conducive to setting a tight enough cap. It wished to move towards greater auctioning to ensure more efficient allocation of allowances and to remove the perverse incentive created by free allocations through the application of standardised allocation methodologies.
UK Phase II cap	The government should be commended for submitting a more stringent cap than other Member States.	The government would continue to show international leadership in the fight against climate change.

Area	Committee recommendation/ conclusion	Government response
EU-wide Phase II caps	The Commission's decision to tighten many Phase II caps meant the EU ETS was more likely to drive real carbon abatement in Phase II and it should increase confidence in the viability and future of the Scheme.	The government agreed with the Committee's assessment.
Auctioning in Phase II	The decision to limit the quantity of auctioning in Phase II was made long in advance. The Committee considered the Commission should not have imposed a restrictive limit on auctioning and that the UK government should have decided to auction more than seven per cent of allowances.	Auctioning seven per cent of allowances represented a significant step towards greater auctioning in the future.
Earmarking of auction revenues	Revenue generated through auctions must not be subsumed into general spending commitments but should be spent on measures to address climate change.	The government would not earmark auction revenue as it would be inefficient and expenditure should be allocated according to priorities.
Equity of the impacts of EU ETS	The EU ETS had indirect impact on many industries through increases in energy prices.	The long term objective of moving away from free allocations should lead to the full cost of carbon being taken into account in investment decisions. The government expected all sectors to play a part in reducing emissions, subject to considerations of competitiveness impacts.
Competitiveness of industry	The government should seek to develop trade agreements rather than watering down the EU ETS cap as a means to protect industry from carbon leakage.	Trade agreements must take account of sustainable development and must be in line with EU objectives of trade liberalisation. The government has reservations about the use of trade barriers as opposed to creating incentives by liberalising trade in new technologies and the creation of an international carbon market.
Impact of EU ETS on UK emissions	Phase II is expected to deliver eight million tonnes of carbon (MtC) savings. However these reductions may take place outside the UK and this may have a significant impact on the credibility of this target.	The government's target recognises the contribution to emission reductions by firms buying emission reduction credits from outside the UK and it agreed with the Committee that it should be transparent when it reports emission reductions occurring inside and outside the UK.
Setting cutbacks against business as usual	Using business as usual projections lacks certainty and effectiveness as this means progress is measured against a moving target.	The government recognises the uncertainties surrounding business as usual projections and it would be considering the issue with the Commission and Member States in the 2007 review of the EU ETS Directive.

Area	Committee recommendation/ conclusion	Government response
Use of project credits	The eight per cent limit on project credits represents two-thirds of the emission reduction effort in Phase II meaning that most UK emission reductions could take place outside not only the UK but outside the EU.	The market for project credits is driving financial flows and the transfer of low carbon technologies to developing economies while reducing global emissions at least cost. Allowing eight per cent use of project credits balances the need for domestic action with the benefits of investing in overseas projects.
Small emitters	Removal of small emitters from the EU ETS and placing them within the Carbon Reduction Commitment is welcomed. However, calls for these firms to be exempted from all but one regime (the Climate Change Levy) must be treated with a great deal of caution.	The government recognises the Committee's concerns about the interaction between policies. The proposed Carbon Reduction Commitment would exempt companies with more than 25 per cent of their energy use covered by a Climate Change Agreement.
Linking with other schemes	Limits on the use of project credits should be harmonised across the EU and the government should press for a qualitative limit to be imposed on the use of these credits.	The government plans to consider aspects such as cap-setting and harmonisation in consultation with stakeholders. It planned to look at a range of options to assess how the EU ETS could best support the development of a robust and effective market in project credits.
Aviation	The inclusion of aviation will only be effective if the terms of its inclusion constrain and ultimately reverse the rise in aviation emissions. The Committee had severe doubts as to the effectiveness of the proposals as they stood in 2007 (notably the impact on airfares and the demand on flying were expected to be minor).	By allocating allowances with reference to the sector's average emissions 2004-2006 the government expected that emissions trading will provide an incentive to reduce emissions. Companies that innovate and reduce emissions more quickly than expected will benefit financially from their progress.
	In light of these concerns the Committee proposed that allocations should be 100 per cent auctioned to the aviation sector. A proportion of the auction revenue should be spent on rail alternatives.	The government is not prepared to earmark auction revenues. No comment on quantity of auctioning.
Transparency of reporting	To aid public understanding of the EU ETS, a high-profile annual report should be published and should include information such as annual allocations and verified emissions broken down by Member State and sector.	The Community Independent Transaction Log provides data on allocations and verified emissions. Defra published a series of reports on the operation of the Scheme in 2005.
Ability of EU ETS to deliver required emission reductions	The EU ETS needs other supplementary measures in order to address concerns relating to certainty and security.	The carbon price is a necessary, but not sufficient, element in securing emission reductions. A wide range of other measures is also needed.

Appendix Two

Methodology

1 This report examines the impact of the EU ETS in delivering reductions of carbon dioxide emissions from UK industry. We designed the study to explore three key questions:

- Has the Scheme worked to date?
- Has the Scheme had its intended impact on industry?
- What are the main learning points relevant to future Phases of the EU ETS?

Review of policy literature

2 We reviewed a variety of literature including departmental, academic and consultancy reports. The literature provided details on the operation of the EU ETS and how government has interpreted its implementation of the Scheme in Phases I and II. We also examined EU literature including text of Directives, the Community Independent Transaction Log and the Communications from the Commission in relation to 2008 Directive negotiations.

Interviews with departments

3 We conducted semi-structured interviews with policy officials in the Department of Energy and Climate Change (including officials from the former Department for Environment, Food and Rural Affairs and the Department for Business, Enterprise and Regulatory Reform). The interviews enabled us to gather further information and clarification to support the literature review. We also obtained the views of the department in relation to the challenges of the EU ETS and to identify the factors for success.

Stakeholders' views

4 During the scoping and fieldwork stages of the study we consulted stakeholders from the following organisations:

- Carbon Trust
- Confederation of British Industry
- Confederation of Paper Industries
- UK Petroleum Industry Association
- Vivid Economics
- World Wildlife Fund

Survey of industry

5 We commissioned consulting firm Entec to undertake an extensive survey of UK companies within six sectors participating in the EU ETS. The six sectors are:

- Energy generation
- Iron and steel
- Refineries
- Offshore oil and gas
- Cement
- Combined Heat and Power

These sectors account for around 90 per cent of the UK emissions captured by the EU ETS in Phase I. Entec developed an online questionnaire that was sent to all companies within these sectors. In total, 56 companies responded from the sample of 164, a response rate of 34 per cent. The responding companies account for 67 per cent of the UK's emissions in the EU ETS in Phase I.

The questionnaire was designed to obtain information from companies in six key areas:

- Their experiences of Phases I and II including whether the company was a net seller or buyer of allowances and the reasons for this, evidence of investments to reduce emissions, experiences of trading and monitoring, reporting and verification costs;
- The position of the EU ETS in corporate priorities in relation to issues such as fuel prices, the economic downturn, issues considered most important in relation to the EU ETS Phases I, II and III, including, to the extent possible, the scope of emissions abatement for Phase III;
- The impact of the EU ETS on strategic, investment and process decisions in Phases I, II and III;
- The extent to which the operators include the price of carbon into daily operations;
- The interaction between the EU ETS and other policy instruments, for example renewables policy, Integrated Pollution Prevention and Control Directive, Climate Change Levy/Agreements and Large Combustion Plant Directive; and
- The impact the EU ETS has had on international competition, and potential carbon leakage issues.

In addition Entec conducted 29 interviews with companies across the six survey sectors to explore in more depth the issues raised in the questionnaire. Further interviews with five sector associations, two banks and two technology providers to obtain additional evidence of the impact of the EU ETS in UK companies participating in the Scheme. Interviews were carried out either in person or by telephone. The interviews were semi-structured and designed to obtain further details of respondents' views in relation to the challenges and opportunities of the EU ETS.

Analysis of EU ETS performance data

6 We used the Community Independent Transaction Log (CITL) to obtain data on the performance of UK installations in Phase I. We also examined documentation provided by the Department in relation to allocation of allowances in Phase I and Phase II.