HM Government

Draft Climate Change Bill

March 2007

Draft Climate Change Bill

Presented to Parliament by the Secretary of State for Environment Food and Rural Affairs
By Command of Her Majesty

March 2007

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Consultation Document

March 2007

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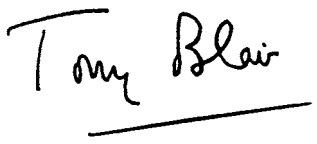
Prime Minister's Foreword

The threat from climate change is perhaps the greatest challenge facing our world. Without decisive and urgent action, it has the potential to be an economic disaster and an environmental catastrophe. This is why I have made it a top priority for this Government, both domestically and internationally.

While the threat is extremely serious, I believe there are also grounds for optimism. The world is waking up to the dangers we face. And just as human ingenuity has accidentally caused climate change, I believe it can play a huge role in helping us undo the damage. But we need to take action now, we need to take it collectively and for the richer nations to support the poorer ones.

This year gives us that opportunity. The reports by the Intergovernmental Panel on Climate Change (IPCC) provide overwhelming scientific evidence that climate change is underway and will become more severe. The G8 summit in June and the UN climate summit in December give us the chance to build on the growing international momentum for action. Our goal must be for the developed and emerging economies to work together towards a new binding and an inclusive post Kyoto framework.

Within this framework, each country, its businesses and its people must play their part. I am proud of the role that the UK has already played, through its action domestically and its international lead, in getting the world to focus on climate change. The Climate Change Bill, the first of its kind in any country, demonstrates our determination that this role will continue.



Tony Blair
Prime Minister

March 2007

Secretary of State's Foreword

There is no longer any real debate over the fact that climate change is happening and that man-made emissions are the main cause. The evidence is stark as to the serious and urgent nature of climate change and the consequences we face from our every-day actions. The decisions we make today will change the way we live in the future. We can, however, avert the worst global scenarios by acting decisively and collectively, without delay. As last year's Stern Review emphasised the longer we put off action, the more dramatic and costly the changes we will have to make.

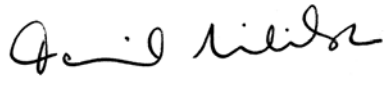
The UK has already taken a strong lead at home and abroad on climate change. The measures set out in the Climate Change Programme Review and Energy Review show our progress domestically and our intentions for the future. Internationally, we are on track to exceed our Kyoto target and are actively engaged in developing the European Emissions Trading Scheme. But there is still a way to go to raise the ambition and urgency of collective action.

The Climate Change Bill will create a strong new legal framework to underpin the UK's contribution to tackling climate change. It will put in place a clear and credible pathway to a statutory goal of a 60% reduction in carbon dioxide emissions through domestic and international action by 2050, with real progress by 2020. This will be based on a new system of "carbon budgets" set at least fifteen years ahead, and with progress reported annually to Parliament. This will provide real clarity on how emissions will be reduced, as well as the flexibility necessary to respond to factors outside our control (such as the weather and global fuel and energy prices).

The Bill will also create a new expert Committee on Climate Change to advise the Government on the best pathway to 2050 – one that achieves our environmental ambitions whilst maintaining a strong competitive economy, secure energy supplies and affordable fuel prices. Alongside this, there will be new powers to set up schemes to reduce emissions.

The Climate Change Bill will put the UK at the very front of global efforts to tackle climate change. We will be the first country in the world to establish such a legal framework. We look to others to follow suit.

Creating such a framework is an enormous challenge for Government and we would like you to join the debate and contribute your views, whatever your interest. The comments that you make will help to determine the final shape of our proposals to tackle climate change.



Rt Hon David Miliband
Secretary of State

March 2007

Summary

i. The UK Government is committed to addressing both the causes and consequences of climate change and to that end is bringing forward proposals for a Climate Change Bill. The Bill will introduce a clear, credible, long-term framework for the UK to achieve its goals of reducing carbon dioxide emissions and ensure steps are taken towards adapting to the impacts of climate change. This consultation document discusses the context and rationale behind the Climate Change Bill and sets out the main reasons why the UK Government considers legislation in this area is required. It outlines the background to and the proposed contents of the Bill, summarising its key elements and how they are expected to fit together.

ii. What is being proposed at present is a draft Bill; no final decisions have yet been made. This consultation therefore invites the views of anyone with an interest and forms a significant part of the process of shaping the Government's final policy proposals.

Context

iii. The UK has been a consistent leader in the field of climate change and energy policy by setting bold targets and pursuing ambitious policies both domestically and internationally. The UK is committed to securing a strong multilateral agreement for the post-2012 period, while in Europe the UK is pushing hard for greater certainty on European plans for implementation of the EU Emissions Trading Scheme (EU ETS) Phase III. The UK has already shown progress in reducing domestic emissions and in order to move to a world that is increasingly "carbon constrained" the UK is committed to move to a low-carbon economy over time – this Bill intends to provide a legal framework for such a move.

Rationale for legislation

iv. The Climate Change Bill is necessary to provide a clear, credible and long-term domestic framework for tackling climate change, whilst at the same time allowing the UK to demonstrate strong international leadership, which is key to helping achieve multilateral agreements. This consultation document proposes the creation of a framework to enable the UK to meet its international obligations, while maximising the social and economic benefits and minimising costs at home. A longer-term framework would provide greater clarity for UK industry to effectively plan and invest in the technology needed in order to move towards a low carbon economy.

Key elements of the Bill

The Bill provides a framework for reducing carbon dioxide emissions through the following four elements:

Setting targets in statute and carbon budgeting

v. It is intended that the Bill will establish an economically credible emissions reduction pathway to 2050, by putting into statute medium and long-term targets. These targets already exist on a non-statutory basis. In addition, a system of carbon budgeting is proposed. This means that for successive five year periods, starting with the period 2008-12, there will be a limit on total carbon dioxide emissions. The Bill proposes that carbon budget periods be set at least three periods (i.e. for fifteen years) ahead. This approach provides for both certainty and flexibility in the system: emissions can vary between years provided the total over a five year period does not exceed the budget.. The series of five year carbon budgets will provide a trajectory from now to 2050, thereby providing a clear framework of expected emissions reductions over time.

Establishing a Committee on Climate Change

vi. The Bill proposes to create a new institutional framework within which to manage the transition to a lower carbon economy, through establishing a new independent body, the "Committee on Climate Change", to advise Government on how to reduce emissions over time and across the economy. This expert body will advise on the optimum trajectory to 2050 by giving advice on the level of carbon budgets, on how much effort should be made in the UK and overseas and how much effort should be made by sectors of the economy covered by cap and trade schemes and by other sectors.

Creating enabling powers

vii. This part of the Bill proposes new powers to enable Government to introduce new domestic emissions trading schemes through secondary legislation. This increases the policy options which Government could use to reduce emissions and meet the medium and long-term targets in the Bill.

Reporting requirements

viii. The final reporting element of the Bill will enhance the overall transparency and accountability of UK action on climate change. It is proposed that the Committee on Climate Change will have a specific annual role in reporting publicly to Parliament on progress towards budgets and targets, with the Government required to lay before Parliament a response to this independent report.

ix. The Bill will also set out a reporting procedure for assessing the risks of the impacts of climate change on the UK in order that we can work across Government, and with wider society to develop and implement measures to ensure we are adapting to these risks. The Bill will also allow Parliament to monitor progress of the Government's proposals and policies for integrating adaptation to climate change into its work.

x. Taken together the elements of this Bill would create a framework to achieve a more coherent approach to managing climate change in the UK – ambitious targets, powers to achieve them, a strengthened institutional framework and clear and regular accountability to Parliament. In tandem with the proposals in the energy review, shortly to be set out in the Energy White Paper, it will equip the UK with the conditions needed for a successful transition to a low carbon economy, and show strong leadership internationally.

1 Introduction

1.1 There is no longer any real debate over the fact that climate change is happening and that man-made emissions are the main cause.

1.2 The debate has now shifted to how much we need to do to stabilise the climate and the economic implications of doing this. The timing is therefore right for us to introduce legislation to strengthen our policy framework for tackling climate change.

1.3 The UK Government is committed to bring forward proposals for a Climate Change Bill that will introduce a clear, credible, long-term framework for the UK to achieve its long term goals of reducing carbon dioxide emissions. The Bill will also set out a reporting structure for an assessment of the risks of climate change and will enable us to monitor progress to help ensure the UK is better able to adapt to those risks.

1.4 This document explains the context and rationale behind the Climate Change Bill. It sets out the main reasons why the UK Government considers legislation in this area is required. It outlines the background to and the proposed contents of the Bill, summarising its key elements and how they are expected to fit together.

1.5 As announced in broad terms following the Queen's Speech in November 2006 there will be four key elements to the Bill – as set out below. Further detail on each element is provided in Section 5 of this document:

a. setting targets in statute and introducing carbon budgeting;
b. establishing a Committee on Climate Change;
c. creating enabling powers; and,
d. reporting requirements including on adaptation.

1.6 A Regulatory Impact Assessment (RIA) has been produced as part of this consultation that provides initial assessments on the impact of the proposals in the Bill.

1.7 We are seeking and welcome your views on all parts of this document, and in particular your responses to the specific questions posed throughout Section 5 and in the RIA.

1.8 Please note the closing date for responses is **12 June 2007**. We cannot guarantee that responses made after that date will be taken into account. Further information on how to respond to this consultation paper is provided in Section 6, which is followed by a complete list of the questions asked.

Devolution

1.9 All four countries of the UK are committed to working in partnership to combat climate change and to achieve the existing (non statutory) target of 60% reduction in carbon dioxide emissions by 2050.

1.10 The devolution settlement with respect to climate change policy is complex; while elements of energy policy[1] and international relations are reserved matters environmental policy is, to varying degrees, devolved to each of the Devolved Administrations.

1.11 This Bill has been drafted for consultation on a UK basis, in other words, drafted with all powers and duties appearing to rest with the Secretary of State. It has not yet been determined how the functions of the Bill would be performed, whether by the Secretary of State, the Devolved Administrations or jointly. This approach has been taken — with the agreement of each of the Devolved Administrations — to enable consultation and debate to proceed on this matter.

1.12 We recognise that significant further work remains to be done before introduction of a Bill to Parliament to clarify how these proposals would be implemented given the complex interplay of reserved and devolved issues. Examples of areas where there are devolved responsibilities which will need to be addressed include:

- the role of the Devolved Administrations in relation to setting, modification and achievement of the UK targets and the intervening carbon budgets;
- their role in relation to agreeing to and implementing trading schemes;
- their role in relation to the Committee on Climate Change, its reporting requirements and its funding; and,
- the ability of the Scottish Parliament, Welsh Assembly and Northern Ireland Assembly to scrutinise matters affecting their devolved responsibilities.

1.13 The devolved administrations in Scotland, Wales and Northern Ireland will need to develop and agree their approach to issues raised in the Bill, for both the substance of the policy and the handling of the devolved issues. The latter will include the legislative route for devolved matters, which might mean separate devolved legislation or the consent of the devolved Parliament or Assembly to UK legislation. The Bill will be amended to take account of these decisions before introduction to the UK Parliament.

1.14 Publication of this Bill does not in any way affect the position of the Devolved Administrations, but aims to allow legislation to proceed as quickly as possible following consultation and pre-legislative scrutiny, whatever approach is decided to these policy and handling issues. Responses to the consultation will be shared with the Devolved Administrations and will inform further consideration of their position.

[1] Energy policy is not reserved for Northern Ireland.

2 Background: Science of Climate Change

2.1 There is an overwhelming body of scientific evidence highlighting the serious and urgent nature of climate change. The Intergovernmental Panel on Climate Change (IPCC) report, published in February 2007[2], shows conclusively that the debate over the science of climate has moved on from whether or not it is happening to what action we need to take.

2.2 Basic physics demonstrates that some gases in the Earth's atmosphere act like a blanket and trap heat near the surface. This 'greenhouse effect' keeps surface temperatures approximately 30°C higher than they would be if the major greenhouse gases were not present. These gases include water vapour, carbon dioxide, methane, nitrous oxide, ozone and several other trace gases. The release of additional greenhouse gases from changes in land use, burning fossil fuels and various industrial processes adds to the blanket, making it more efficient at trapping the sun's energy and leading to rising global average temperatures.

2.3 The IPCC report confirms that atmospheric concentrations of the major greenhouse gases, carbon dioxide, methane and nitrous oxide have all increased significantly since pre-industrial times because of human activities. For example, carbon dioxide concentrations have risen by just over one third from 280 parts per million (ppm)[3] in around 1750, to 379ppm in 2005[4]. Including other major greenhouse gases, the total warming effect is equivalent to around 430ppm carbon dioxide[5]. This concentration is far higher than the natural range of 180-300ppm over at least the last 650,000 years, as determined from ice cores.

2.4 The impacts of emissions of greenhouse gases from human activities anywhere in the world are the same because the gases are well-mixed in the atmosphere and they effect the climate system as a whole. Similarly, emissions reductions anywhere have a positive impact, through reducing warming on a global scale.

2.5 Global mean temperatures have risen by 0.74°C over the past century, with 0.4°C of this warming occurring since the 1970s. In the UK, average annual central England temperatures are now higher than at any time since records began in 1659. The IPCC concludes that most of the increase in global temperatures since the mid-20th century is very likely due to the human-induced accumulation of greenhouse gases in the atmosphere. We are already

[2] Working Group I Contribution to the Fourth Assessment Report: *Climate Change 2007: The Physical Science Basis*, available from: http://www.ipcc.ch. The reports of the other working groups, and the Fourth Assessment Report (AR4) will be released in the course of 2007.
[3] Parts per million (ppm) is the ratio of the number of greenhouse gas molecules to the total number of molecules of dry air.
[4] Source: IPCC, 2007: *Climate Change 2007: The Physical Science Basis*
[5] Also known as carbon dioxide equivalent, or CO_2e

committed to an additional global warming of 0.6°C by 2100 because of recent emissions.

2.6 The Stern Review recently stated that without intervention greenhouse gas levels will reach no less than 550ppm CO_2e by the middle of this century[6]. This level alone would commit the world to a warming of at least around 2°C above pre-industrial levels in the long term, with some recent studies suggesting up to a 20% probability that the warming could be greater than 5°C. A climatic change of this magnitude would be far outside the experience of human civilisation and comparable to the difference between temperatures during the last ice age and today.

2.7 The IPCC report estimates that without intervention greenhouse gas levels will rise to 600-1550 ppm CO_2e by 2100, depending on future emissions. This would be associated with a warming of between around 1.7 and 7.0°C above pre-industrial levels (or 1.1 to 6.4°C above 1990 levels) by the end of the century, and a further few degrees warming in the following century.

2.8 The report of the major international conference in 2005, *Avoiding Dangerous Climate Change*, noted a number of critical temperature levels and rates of change relative to pre-industrial times. These vary for the globe, specific regions and sensitive ecosystems. For example, a regional increase above present levels of 2.7°C may be a threshold that triggers melting of the Greenland ice-cap, while an increase in global temperatures of about 1°C is likely to lead to extensive coral bleaching.

2.9 Recent climate modelling research confirms that delaying action now would require greater action later for the same temperature target and that a delay of only 5 years could be significant. If action to reduce emissions is delayed by 20 years, rates of emission reductions may need to more than double to meet the same temperature target than if reductions were begun now.

2.10 The latest IPCC report emphasises that warming will be associated with many other changes in climate, such as rising sea levels, changes in rainfall patterns and increased frequency of heat waves and intense hurricanes. The impacts of these changes on human society and on biodiversity are likely to be very significant.

2.11 The wealth of evidence now available makes clear that some level of further climate change is unavoidable. We can avert the worst global consequences however, by acting decisively and collectively, without delay. The longer we put off action, the more dramatic and costly the changes we will have to make.

[6] The Stern Review on the Economics of Climate Change, available from: http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

3 Context: Domestic and International Action

3.1 Climate change is a global problem which demands a global solution, hence there exists a range of international frameworks to tackle the problem. The UK has been a consistent leader in the field of climate change and energy policy by setting bold targets and pursuing policies, both domestically and internationally, relating to mitigating and adapting to the impacts of climate change. The UK has also benefited from continuous economic growth while emissions have fallen. But challenges remain: recent years have not seen the fall in carbon dioxide emissions needed to move the UK to a truly low carbon economy.

International Action

3.2 The UK played a major role in negotiating the Kyoto Protocol[7], undertaking to make substantial cuts - we are one of a few countries on track to more than meet our Kyoto commitment. The UK is committed to securing a strong multilateral agreement for the post-2012 period that achieves the overarching UNFCCC objective of stabilising atmospheric concentrations of greenhouse gases and avoiding dangerous climate change.

3.3 The UK took a substantial lead in promoting climate change on the international agenda as part of our Presidencies of the G8 and EU in 2005. This led to an agreement at the G8 conference in Gleneagles for a new Dialogue on Climate Change with the leaders of China, India, Brazil, Mexico and South Africa which will report to the Japanese G8 Presidency in 2008.

3.4 Securing multilateral agreement is not in the UK's gift alone, but we and other developed countries can make it more likely by effectively influencing the actions and positions of others. We can also seek agreement for much more ambitious collaboration with emerging economies.

3.5 In the European context, the EU Emissions Trading Scheme (EU ETS) is a key plank of EU climate and energy policy, which tackles emissions from large point sources of emissions such as the electricity generation sector. A Commission-led review of EU ETS is currently ongoing which the UK is actively engaged in. This is intended to strengthen the scheme by analysing its functioning and design with respect to a number of specific issues, evaluating the impact of expanding the EU ETS to other sectors and gases, and understanding the impact of the EU ETS on competitiveness.

3.6 The UK will push hard for greater certainty on European plans for implementation of the EU ETS beyond 2012, as it is considered the most

[7] See Box 1: International Framework for further details.

important mechanism for stimulating UK and international investment in low-carbon technology.

3.7 EU Ministers have already said that developed countries should consider greenhouse gas emissions reductions in the order of 15-30% by 2020[8]. The UK Government is now pushing for the EU to go further. At the launch of the Stern Review the Chancellor of the Exchequer announced the UK's proposal for a new European-wide emissions reduction target of 30% by 2020 and then at least 60% by 2050.

3.8 At the Spring European Council on 8/9 March 2007, EU Heads of Government agreed an ambitious, independent binding target to reduce Europe's greenhouse gas emissions by at least 20% by 2020 (compared to 1990 levels) and to increase this commitment to a 30% reduction as part of an international agreement. They also decided to: increase the use of renewable energy sources so that they make up 20% of EU energy consumption by 2020, with differentiated overall targets for Member States; ensure that a minimum of 10% of EU transport petrol and diesel consumption comes from bio-fuels by 2020; promote energy efficiency by reducing overall EU energy consumption by 20% by 2020; and stimulate the use of new technology on clean coal power stations, with the aim of bringing environmentally safe carbon capture and sequestration (CCS) to deployment with new fossil-fuel power plants, if possible by 2020.

Box 1: *International Framework*
The overarching goal of the United Nations Framework Convention on Climate Change (UNFCCC) is to stabilise global greenhouse gas (GHG) concentrations at a level that avoid dangerous climate change. The Kyoto Protocol strengthens the framework by committing developed countries to individual, legally binding targets that limit or reduce their emissions.

Based on the principle of "common but differentiated responsibilities" Kyoto sets out that the richest countries - historically responsible for the majority of global GHG emissions - take on targets to prevent, reduce and control atmospheric concentrations of these harmful gases.

The framework also allows abatement projects in developing countries to enable technology transfer and sustainable low carbon growth on the basis that where the emission abatement occurs is irrelevant environmentally.

Please see: http://unfccc.int for further details.

3.9 Adaptation is also being addressed at the international level[9]. While it is expected that adaptation will be more prominent in any agreement on how to tackle climate change post-2012, it is currently unclear what form this should take. The question of whether adaptation, which is best delivered at a local

[8] Environment Council conclusions March 2006. Further information available from: http://europa.eu/rapid/pressReleasesAction.do?reference=PRES/06/58&language=en.
[9] Article 4.4 of the UNFCCC commits developed countries to "assist the developing countries that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those effects." Further information is available from: http://unfccc.int/adaptation/items/2973.php

level, can be administered by a global, top-down instrument has yet to be tackled.

3.10 There is also work taking place at the European level. In 2006, the European Commission held a series of consultative meetings with different sectors to inform their work on impacts and adaptation. A green paper will be published in summer 2007 proposing how the EU should take forward this agenda and identifying the role they can play in promoting awareness and building capacity.

Domestic Commitments

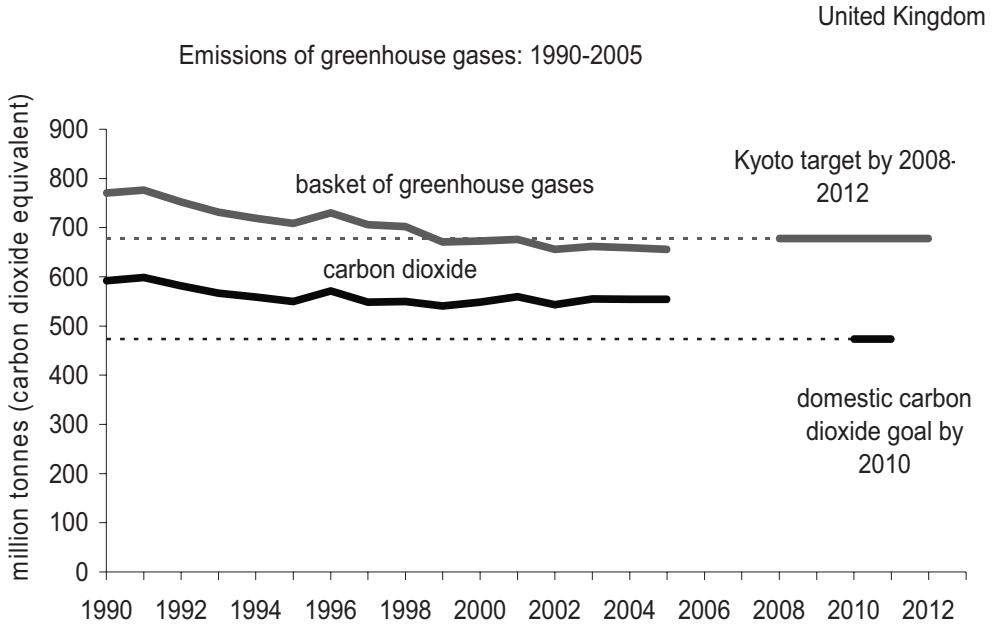
3.11 Domestically, the UK has already put in place a wide range of measures to reduce its CO_2 and other greenhouse gas (GHG) emissions, and is considering the introduction of others, as set out in the Climate Change Programme Review[10] and Energy Review[11].

3.12 The UK is already projected to reduce GHG emissions by nearly double its commitment under Kyoto[12], one of the best records of any Kyoto signatory. Conversely, the Government's domestic 2010 CO_2 target – to reduce CO_2 emissions by 20% on 1990 levels – presents a difficult challenge as **Figure 1** below illustrates. Although there has been considerable progress, with CO_2 emissions projected to be 16.2% lower than 1990 levels in 2010[13], higher than anticipated levels of economic growth and the recent rise in global energy prices, has altered the relative prices of coal and gas. This has led to a switch from gas back to coal which has increased the UK's CO_2 emissions in recent years.

[10] Available from: http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm
[11] Available from: http://www.dti.gov.uk/energy/review/page31995.html
[12] The UK's target under the Kyoto Protocol is to reduce greenhouse gas emissions by 12.5% below 1990 levels by 2008-12. The Protocol covers a "basket" of six greenhouse gases: carbon dioxide, nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6). Carbon dioxide is by far the largest component of the basket. Other greenhouse gases like chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are not covered in this agreement since they are controlled by the Montreal Protocol. The Kyoto Protocol does not call for the phase-out of any greenhouse gases, only the overall reduction of the emissions. Countries are free to choose to reduce some gases more than others depending on their particular needs and circumstances.
[13] UK energy and CO_2 emissions projections, July 2006 (UEP26), available from: http://www.dti.gov.uk/files/file31861.pdf

Figure 1

This shows total UK emissions for the 'basket' of greenhouse gases[13] and specifically CO_2 since 1990, calculated in the format required by IPCC. Carbon dioxide emissions include those achieved overseas through purchasing emissions reduction credits.



Source: AEA Energy & Environment

3.13 The Government would therefore like to enshrine the commitments in the Energy White Paper 2003[14] to reduce CO_2 emissions by 60% on 1990 levels by 2050; and to achieve "real progress" by 2020 (which would equate to reductions of 26-32%) towards the long-term goal within a new legal carbon management framework (outlined in Section 5).

3.14 In order to be prepared for a future in which the world is increasingly carbon constrained, and to make this outcome more likely, the UK Government is committed to moving towards a low carbon UK economy over time – consistent with the energy objectives set out in the Energy White Paper.

3.15 The UK is currently responsible for 2% of global GHG emissions and therefore is clearly unable to address the global problem of climate change alone. However, this point should not be used as an excuse for not taking further action. The major developed economies are responsible, collectively, for approximately three quarters of the increase in GHG concentrations above pre-industrial levels. There is therefore a moral obligation on those responsible to show leadership in addressing the challenge of climate change. Moreover, the UK's responsibility for a small proportion of current emissions demonstrates the importance of achieving concerted international agreement to tackle climate change. If we can show that emissions can be significantly reduced in the UK in a way which balances environmental, economic and social concerns, this may

[14] "Our Energy Future - Creating a Low Carbon Economy", available from: http://www.dti.gov.uk/files/file10719.pdf

encourage other countries to take similar action and support a strong multilateral framework.

3.16 The Government has also made good progress on ensuring the UK becomes better adapted to the impacts of unavoidable climate change. We are currently developing a cross-Government framework regarding adaptation[15]. However, we recognise that we still need to do more to ensure that processes are consistent and that adaptation in one sector does not compromise the ability of another sector to adapt or mitigate. Much of this work is supported by the Defra-funded UK Climate Impacts Programme (UKCIP)[16].

3.17 It is clear that to tackle climate change, we have to do more. This is why we are seeking to enshrine our emissions reduction framework and adaptation reporting framework in legislation. This is discussed in more detail in the following section.

[15] This will be published in late 2007.
[16] Please see: http://www.ukcip.org.uk/ for further information.

4 Rationale for Legislation

4.1 In headline terms the rationale for introducing climate change legislation is as follows:

Rationale for Legislation

- To demonstrate leadership by example to help foster collective international action.
- To create a clear and coherent framework to enable the UK to meet domestic and international commitments.
- To provide greater clarity and certainty for UK industry, households and individuals to effectively plan for and invest in a low carbon economy.
- To maximise social and economic benefits and minimise costs to the UK as we pursue these goals.
- To help the UK towards being better adapted to the impacts of unavoidable climate change.

4.2 Attitudes on climate change are shifting across the globe, driven by concerns over energy security (which is essential for maintaining economic security and prosperity), business calling for regulatory certainty, and an increasingly vigorous public debate. Climate change is a global problem and international co-operation is therefore essential to ensure the risks it presents to the environment are effectively managed while minimising the associated economic costs. Any action to tackle climate change needs to consider adaptation as well as mitigation.

4.3 Whilst it is likely that every nation will need to contribute to a co-ordinated response, leadership must come from the major developed economies – such as the UK – which have been responsible for the majority of the historic rise in greenhouse gas concentrations. Generally such countries have the necessary conditions to be leaders of change: high *per capita* emissions; relative prosperity and economic stability; established regulatory frameworks and relevant policy experience. In the UK we also have high public awareness of the issue of climate change.

4.4 The time is right for Governments wishing to show leadership to act to introduce effective frameworks for reducing emissions and adapting to the effects of unavoidable climate change, showing that a balance can be struck between

environmental, economic and social objectives, and there is more evidence than ever before that such leadership will encourage others to do the same. The UK's Climate Change Bill will help us lead by example internationally and help raise the ambition and urgency of collective action post-2012, following the end of the first Kyoto period.

4.5 In anticipation of international agreement setting out a framework of binding, long-term greenhouse gas emissions reduction targets and adaptation policies post-2012, a clear and robust domestic framework which takes a rounded view of the approach to mitigating climate change is needed. The Bill will create such a framework, to enable the UK to meet domestic targets as well as ensuring the UK can meet its existing and future international commitments.

4.6 A strong, well-designed framework, should maximise the social and economic benefits and minimise the costs to the UK as we pursue our emissions reduction goals. In order to achieve this we intend to develop the Bill, and subsequent policy, in line with the Government's Better Regulation agenda. A high quality regulatory framework that enables improved decision making, minimises bureaucracy, and simplifies the legislative framework, will reduce business costs.[17] The Government also welcomes the contribution from the Better Regulation Commission on "Regulating to Mitigate Climate Change: a Response to the Stern Review"[18], and will be working to develop a response to this, for publication in May this year.

4.7 The Bill will need to ensure that the optimum low-carbon investment decisions can be taken now, while providing business with a clear view of the costs and benefits of early action and avoiding undue negative impacts on society, the UK economy and business competitiveness. It needs to take due account of the extent to which the UK is acting unilaterally. The framework will therefore need to be sufficiently flexible to absorb any short-term shocks and be able to take account of changing circumstances at home and abroad.

4.8 In addition to minimising mitigation costs, it is likely that delivering this framework will lead to benefits across parts of the UK economy, for example by driving innovation among domestic firms for low carbon solutions allowing "first mover" advantages to be realised. Reducing emissions is also likely to deliver a range of co-benefits including improved air quality, reduced reliance on imported fuel, and reduced fuel poverty.

4.9 The financial returns to investment in low carbon technologies are determined in part by Government intervention in markets using policies such as taxation, trading schemes or regulation. There is uncertainty surrounding the degree of climate change mitigation that will be undertaken in future due, in part, to: the absence, as yet, of an international agreement extending beyond 2012 (as a successor to Kyoto) as well as defined commitments as part of Phase III of the EU-ETS, and the perceived risk that existing non-statutory targets may be subject to change (with implications for the way in which policy is managed).

[17] Detailed consideration is given to the costs and benefits for the proposals in the Regulatory Impact Assessment.
[18] Please see http://www.brc.gov.uk/

4.10 This uncertainty is likely to reduce the willingness of households and particularly firms to invest in low carbon technologies and innovation. This uncertainty could increase the risk of 'lock in' to carbon intensive patterns of production and consumption, particularly in markets which are currently investing heavily and are dominated by long lived capital, such as electricity generation and buildings.

4.11 By proposing to enshrine domestic commitments in statute, the Government would increase certainty for UK households and particularly firms investing in the UK that there will be carbon constraints in the UK from now on and that these will progressively tighten.

4.12 This climate change legislation will therefore help address the issue in both the domestic and international contexts. It will provide UK business with greater long-term certainty to help plan cost-effectively for a low carbon future, by placing an economy-wide limit on carbon dioxide emissions covering all sectors, doing so in a way which balances environmental, economic and social factors, and, demonstrating to our international partners the need for ambitious and urgent action to deal effectively with the challenge at a global level.

4.13 As discussed in the next section, the Bill will propose statutory duties on Government relating to both mitigation of, and adaptation to, climate change.

5 Key elements of the Bill

Introduction

5.1 As announced by the Secretary of State in November 2006, it is intended that the Climate Change Bill will comprise four overarching "pillars":

i. a system to establish a credible emissions reduction pathway to 2050, with the UK's existing 60% target for 2050 placed in statute;
ii. a strong institutional framework within which to manage the transition to a lower carbon economy, through establishing a new independent body, the Committee on Climate Change, to work with the Government on how to reduce emissions over time and across the economy;
iii. powers to provide additional means with which to achieve emissions reductions; and,
iv. a clear accountability framework, in particular in relation to Government's reporting to Parliament on mitigation and adaptation.

5.2 Together these pillars form a strong coherent package: credible targets with a credible system to achieve them – respected institutions, open monitoring, transparent reporting and powers available to act where needed.

Targets and Budgeting

Setting statutory targets

5.3 The Government proposes that this Bill should put into statute the UK's targets to reduce carbon dioxide emissions through domestic and international action by 60% by 2050 and 26-32% by 2020, against a 1990 baseline[19].

5.4 Last year's Stern Review of the economics of climate change stated that, in order to achieve a stabilisation of atmospheric greenhouse gases at a level which would avoid the more damaging effects of climate change, the world needs to reduce overall emissions by about 50% (stabilising within the range of 450-550ppm CO_2e)[20], compared to current levels. This means industrialised

[19] Please note these are unilateral targets which we would only change in the event of significant developments in scientific knowledge about climate change or in international law or policy which made it appropriate to do so. NB: these do not include emissions from international aviation and shipping which are not currently part of the Kyoto targets or EU ETS.

[20] For the purposes of this Bill greenhouse gas emissions, reductions of such emissions and removals of greenhouse gases from the atmosphere, shall be measured or calculated in tonnes of carbon dioxide equivalent (CO_2e). A tonne of carbon dioxide equivalent means one metric tonne of carbon dioxide or an amount of any other greenhouse gas with an equivalent global warming potential (calculated consistently with international carbon reporting practice).

countries such as the UK reducing their contribution to greenhouse gas emissions by at least 60%.

5.5 It is imperative that industrialised countries make a serious commitment to achieving these levels of emissions reductions, which is why we would like to put in statute a target to reduce the UK's contribution to global CO_2 emissions by 60% compared to our emissions levels in 1990. But there is a risk that a commitment for 2050 alone is too long-term; it might not encourage the action needed over the next few years that will be key to achieving our longer term goals. This is why we also want to put into statute a duty to ensure the trajectory to 2050 is consistent with a reduction in CO_2 emissions by 26-32% by 2020[21], consistent with the trajectory to 2050. We believe this is achievable at acceptable cost with the right policies and actions.

5.6 Climate change is a global issue and we intend that by setting our unilateral 2050 and 2020 targets in legislation we will demonstrate our commitment to achieving a global solution to the problem. We anticipate that other industrialised countries or states may want to follow suit. California has already introduced state-wide emissions limits; the EU has called for a 30% reduction in GHG emissions by 2020 in the context of a new international framework post-2012[22]. Measured against both the EU's independent target of a reduction of at least 20% and the more challenging 30% target, it will be clearly evident from this Bill that the UK is committed to taking on its fair share.

5.7 With statutory targets in place we will have a more compelling case to drive forward an effective and binding multilateral agreement for the next phase of the Kyoto Protocol, starting in 2013. The UK may be prepared to go further than its unilateral targets in the context of an international agreement.

5.8 The emissions reduction targets do not currently apply to carbon dioxide emissions from international aviation and shipping. These emissions are not part of the Government's existing targets, nor are they part of the current Kyoto Protocol target or EU ETS. And there is currently no international agreement on how to include these emissions in national inventories. However, there is scope in the Bill to include these sectors in the legislative framework should international policy change.

5.9 We are focusing our emissions reduction goals on carbon dioxide as we have made less progress in reducing this gas than other greenhouse gases. CO_2 is by far the most significant of the greenhouse gases, accounting for some 77% of global greenhouse gas emissions in 2000. Anthropogenic activity has led to a significant increase in its atmospheric concentration from pre-industrial times (since 1750), and the scientific debate on climate change has reached a consensus, largely through agreement on the extent of the correlation between CO_2 emissions and global temperature changes.

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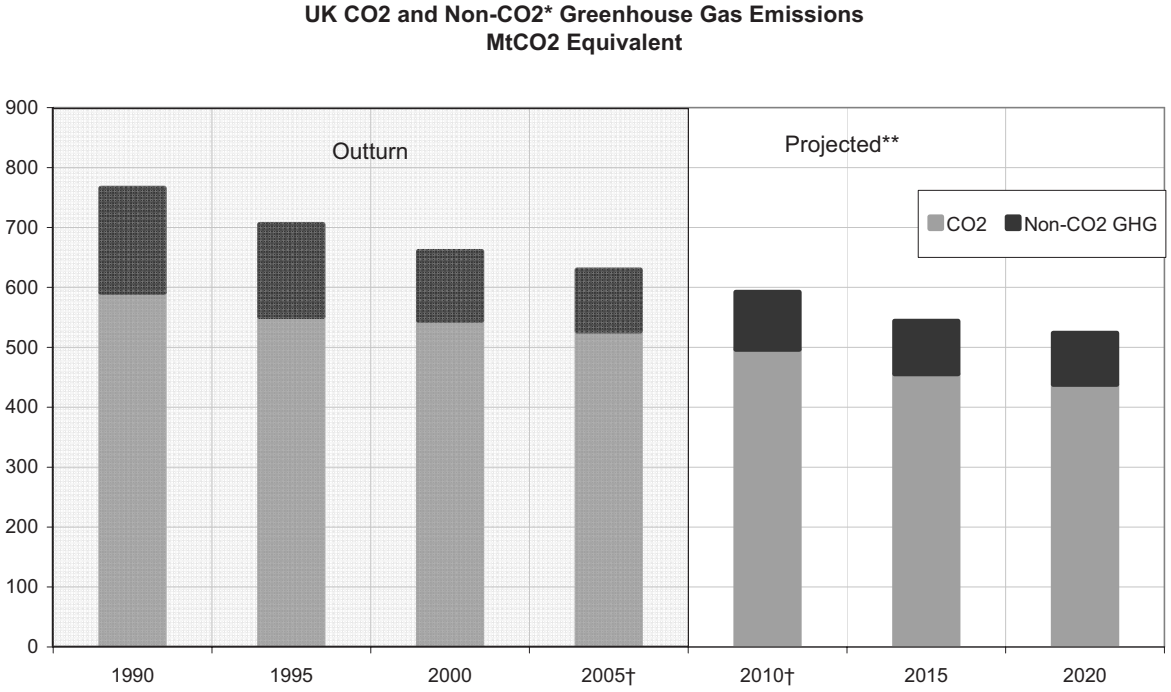
[21] This will mean a reduction in all GHGs in the order of 32-37% by 2020.
[22] With a reduction of at least 20% proposed in the absence of an international framework.

5.10 Climate change mitigation will not be possible without specific actions focused on reducing CO_2 emissions. This means moving to lower carbon technologies across the economy. It is intended that this Bill relates to CO_2 rather than other GHGs in order that this focus is maximised.

5.11 Carbon dioxide emissions currently make up a large part of UK GHG emissions: for example, in 2005 CO_2 made up slightly less than 85% of all UK GHG emissions – **figure 2** shows that current and projected CO_2 emissions will continue to form a large majority of UK GHG emissions.

Figure 2



Source: 2006 Climate Change Programme Review, Defra News Release - "Greenhouse gas statistics" - January 2007, DTI Updated Emission Projections, July 2006 (UEP26)[23]

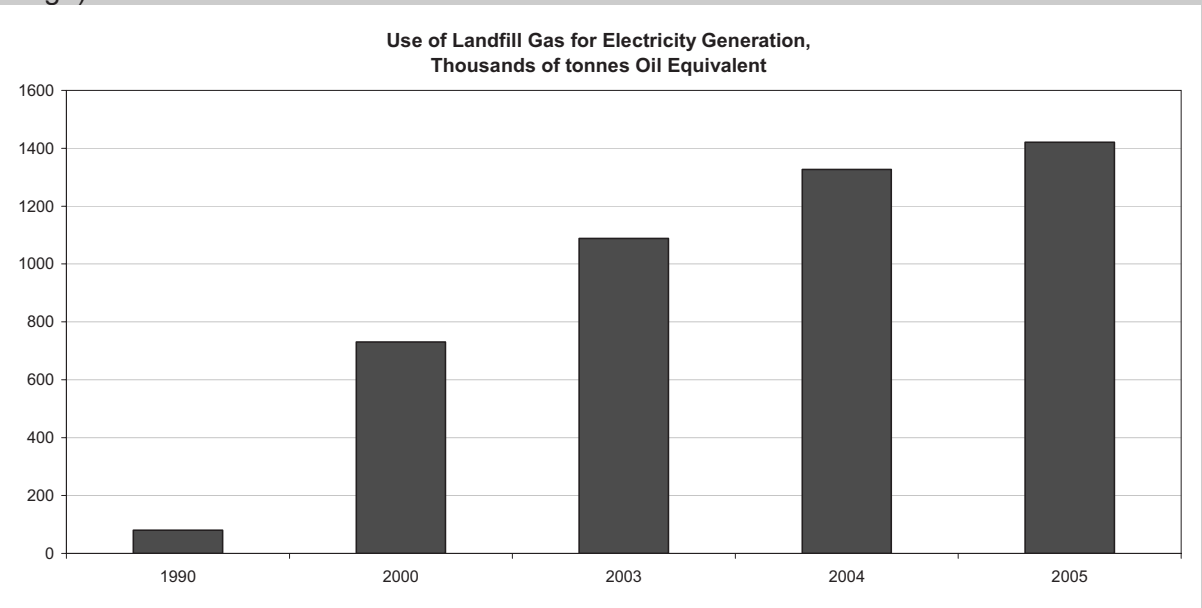
5.12 Through a range of measures (some listed in Box 2 below) the UK has been successful in reducing emissions from non-CO_2 greenhouse gases; in 2005 emissions had fallen 44% since 1990 and are projected to fall 50% by 2050 (below the 1990 baseline). Further non-CO_2 emissions reductions can be very difficult and/or costly, for example as concluded in a recent study on non-CO_2 emissions reductions from certain activities[24].

[23] Notes: *Non-CO_2 refers to the "basket" of gases as set out in the Kyoto Protocol – see footnote 8; **CO_2 emissions projections based on Updated Energy Projections (UEP) 26 (July 2006) plus central expectations of emission savings from July 2006 Energy Review, including 29.3MtCO2 (8MtC) savings from EU ETS, plus additional savings from announcements made since. As published in reporting of Greenhouse Gas House statistics, January 2007. 2005 includes net purchases of allowances made under the EU ETS Phase I.

[24] AEAT report for Defra: "Mechanisms from reducing Methane and HFC emissions from four selected sectors", October 2005. Available from: http://www.defra.gov.uk/environment/climatechange/trading/uk/pdf/aeat-reducing-emissions-report.pdf

Box 2: Tackling Non-CO_2 Emissions

Methane emissions from landfill, which constituted slightly below 60% of all methane emissions in 1990, have fallen 60% by 2005, largely due to use of landfill gas in electricity generation, which by 2005 had risen 18-fold from 1990 levels (based on oil equivalent usage).



Source: UK Energy in Brief: 2006, DTI June 2006, http://www.dti.gov.uk/energy/statistics/publications/in-brief/page17222.html

Emissions from **Agriculture, Forestry and other Land Management sectors** were the source of around 8% of GHG emissions in 2004[25] (taking account of differing Global Warming Potential of the different gases). However, these sectors are the source of two-thirds of nitrous oxide emissions and over a third of the methane emissions in the UK. As expressed in the Climate Change Programme Review 2006, the Government is committed to "*examining the scope and feasibility of a market based mechanism to facilitate trading of greenhouse gas (GHG) reductions from agriculture, forestry and other land management sectors".*

European regulation has been a key element in introducing a suite of policies designed to reduce non-CO_2 GHG emissions, for example the fluorinated gas regulations introduced in May 2006[26]. From July 2006, these regulations prohibit the placing of products and equipment containing, or whose functioning relies upon, fluorinated greenhouse gases on the market. In addition, the regulations mandate prevention and repair of leakages; arrangements for gas recovery when capital equipment is recycled, reclaimed or destroyed; and the introduction of a system of labelling to identify type and quantity of F-gases in specified products. From July 2007, these regulations prohibit the use of sulphur hexafluoride (or preparations thereof) in vehicle tyre production and magnesium die-casting (from July 2008).

5.13 Taking account of these arguments in favour of an exclusive focus on CO_2 at this stage, a broader target encompassing all of the principal greenhouse gases

[25] Source: UK Climate Change Programme 2006, available from: http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

[26] Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases. Available from: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_161/l_16120060614en00010011.pdf
Initial guidance on the Regulation is available from: http://www.defra.gov.uk/environment/climatechange/uk/fgas/pdf/fluorgasreg-guidance.pdf

could also have benefits. The Kyoto protocol, as a global agreement, reflects the fact that it is the combined effect of greenhouse gases which causes global warming, and there may be merit in the UK taking on a wider greenhouse gas target. The Government has also called for the EU to consider whether to expand the EU ETS to cover gases other than CO_2 in the post-2012 period. Such a change could require the Government's carbon budgets to expand similarly. However the decision on whether to enshrine in statute a CO_2-only target, or whether to consider the wider basket of greenhouse gases, is clearly a complex one – it is certainly something that the legislation should provide for as a specific area for ongoing review.

Question 1: Is the Government right to set unilaterally a long-term legal target for reducing CO_2 emissions through domestic and international action by 60% by 2050 and a further interim legal target for 2020 of 26-32%?

Question 2: Is the Government right to keep under review the question of moving to a broader system of greenhouse gas targets and budgets, and to maintain the focus at this stage on CO_2?

Carbon budgeting

5.14 Our overall contribution to global greenhouse gas concentrations is determined by our emissions into the atmosphere over time. Meeting specific targets in specific years is therefore less relevant than the total level of emissions over time. For this reason, in addition to our commitments for 2050 and 2020, we are proposing to set in statute a system focussing on total emissions over time as we move towards these longer term goals. This will make the proposed pathway towards achieving our targets far clearer and help to ensure that action to meet our longer term goals happens early and (drawing on expert advice) in an economically efficient way.

5.15 Our proposed method of expressing this trajectory is through a system of "carbon budgeting". A carbon budget is, quite simply, a limit on the total quantity of carbon dioxide emissions over a specified period of time (as explained further in Box 3). We propose that each carbon budget period should be five years long, starting from the beginning of 2008. This ensures that the first budget period, 2008-12, runs concurrently with the first Kyoto protocol commitment period and the second phase of the EU ETS. We believe that a five-year carbon budget provides the right balance between the certainty needed about how much CO_2 should be emitted during a period of time, and the flexibility needed to accommodate inevitable annual variations in factors such as fuel prices and weather conditions which have a direct effect on CO_2 emissions and make a series of annual targets impractical[27]. Indeed, we believe that for this reason a system of five year carbon budgets is the best method of ensuring that emissions reductions occur continuously, with the avoidance of costly one-off reductions in target years only. The concept of carbon budgets is not new; the architects of the Kyoto protocol have already recognised the merits of such

[27] Paragraphs 5.9-5.13 discuss in more detail why CO_2 targets rather than GHG targets are being proposed.

budgets, and this is why the commitment period of 2008-12 is actually a budget with a limit on total greenhouse gas emissions over this period.

5.16 Of course, five years provides insufficient certainty for many businesses making longer term investment decisions. For this reason we are proposing to set a target for 2050 into statute, and provide additional short and medium term clarity by proposing that the trajectory to our 2020 target should be represented by setting in place three five-year carbon budgets, for the periods 2008-12, 2013-17, and 2018-22. This would provide a full fifteen year horizon of expected CO_2 emissions reductions, and a strong, clear signal about the subsequent direction. Future carbon budgets would then be set to ensure that there were always three budget periods' worth of carbon budgets in statute, giving medium-term clarity whilst recognising that it is not realistic to guess conditions more than fifteen years in advance.

Box 3: *What is "Carbon Budgeting"?*

Akin to a financial budget, a "Carbon Budget" refers to the aggregated quantity of CO_2 emissions which are permitted during a specified time period, in this case five years long. For example the first budget which would cover the years 2008-12 would be expressed as "x million tonnes of CO_2".

The diagram below provides an indicative illustration of how the first three carbon budgets may work. **Figure 3a** shows a trajectory whereby the level of emissions permitted by the carbon budget is reduced over time. **Figure 3b** presents the detail of how emissions within a five-year budget period may fluctuate, providing the aggregate for the five years does not exceed the limit set out in the budget. Thus a system of five-year budgets provides for increased year-on-year flexibility whilst still ensuring an emissions reduction trajectory results.

Figure 3a: Indicative levels of first three budgets

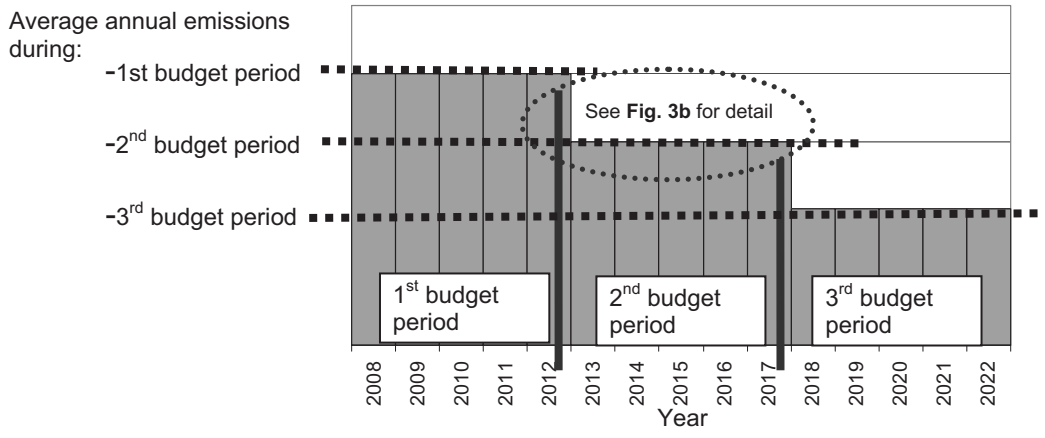
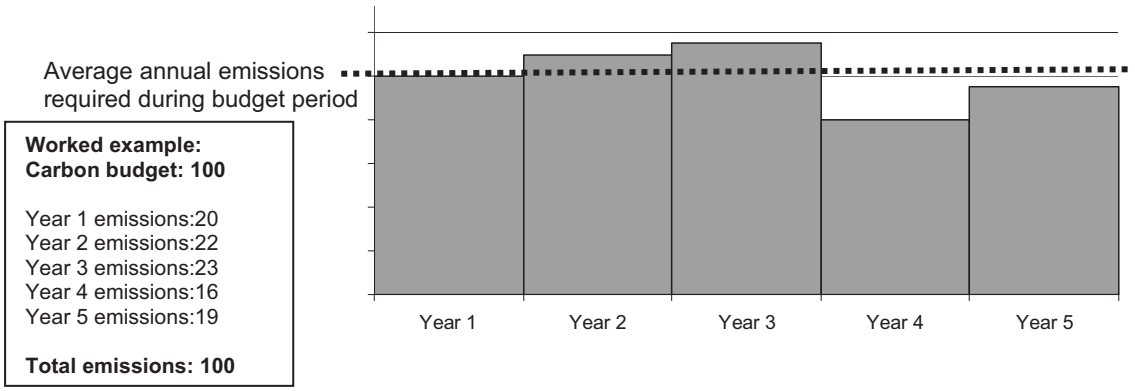


Figure 3b: detail of the effect of aggregate emissions within budget period



5.17 It is proposed that carbon budgets should be set with regard to a number of factors. They should provide a trajectory to meeting our 2050 target and 2020 interim target[28], whilst being consistent with international law. They should also be set by taking into account a number of factors, including:

(a) scientific knowledge about climate change;
(b) technology relevant to climate change;
(c) economic circumstances, and in particular the likely impact of the decision on the economy and the competitiveness of particular sectors of the economy;
(d) fiscal circumstances, and in particular the likely impact of the decision on taxation, public spending and public borrowing;
(e) social circumstances, and in particular the likely impact of the decision on fuel poverty;
(f) energy policy, and in particular the likely impact of the decision on energy supplies and the carbon and energy intensity of the UK; and,
(g) international circumstances.

5.18 The aim in considering all such relevant factors when setting carbon budgets is to achieve the optimal pathway to the 2020 and 2050 targets; a pathway which is consistent with the environmental outcome we want whilst maximising benefits and minimising costs.

5.19 At the same time as any new budgets are set, we propose that the Government has a legal duty to set out in a published report its proposals and policies for meeting the budgets for the three periods ahead. By providing a clear indication of its intentions the Government should reinforce business and public confidence that plans are in place to ensure budgets will be achieved.

Question 3: Should the UK move to a system of carbon management based upon statutory five-year carbon budgets set in secondary legislation?

[28] Strictly speaking, the legislation intends to incorporate the 2020 target into statute by requiring that the average annual emissions during the carbon budget containing the year 2020 (i.e. the period 2018-22) should be at least 26%, and not more than 32%, lower than the 1990 baseline level of emissions.

Question 4: Do you agree there should be at least three budget periods in statute at any one time?

Reviewing targets and budgets

5.20 Internationally, the commitments enshrined in the Kyoto protocol are only binding until the end of 2012. Negotiations to reach a consensus for the post-2012 period are currently underway and it is essential that agreement is reached in 2009.

5.21 Ahead of such an international agreement, it would be prudent for the UK to allow sufficient flexibility in its domestic framework so that it will not be inconsistent with the eventual multilateral context. This means that the statutory targets and carbon budgets that the UK sets itself as part of this legislation should be open to review, should there be significant developments in relevant circumstances.

5.22 The targets for 2050 and for the 2018-2022 budget are intended to provide long and medium term clarity over the direction of Government policy. As the key fixed points of the legislation, it is appropriate that they can only be adjusted in limited circumstances and with the approval of Parliament. For reviewing the 2050 and 2020 targets these factors would be:

- scientific knowledge about climate change – for example if significant new evidence emerges on the impacts of global warming which might require higher or lower rates of emissions reductions internationally, then this may need to be reflected in our domestic targets; and,
- international law and policy – for example if a new multilateral agreement requires the UK to act differently[29] then the national target should be amended to reflect this.

5.23 In addition, it is imperative that a sustainable emissions reduction pathway is associated with continued strong economic growth and opportunities for all. The Government is committed to strong action to tackle climate change, but recognises there are some additional risks and costs potentially associated with acting unilaterally, and is determined to ensure that the UK does not suffer significant shocks as a result of its unilateral commitments, particularly shocks imposing short term costs which deliver comparatively little by way of long term environmental benefit. It therefore considers that five year carbon budgets specifically should also be subject to review and possible amendment to ensure that environmental goals are always being achieved in the most proportionate way, taking account of significant changes affecting the basis upon which the budgets were set (see paragraph above for details on the factors making up this basis).

[29] For example: if the UK were compelled to adopt more stringent emissions reduction targets; or if emissions from international aviation and/or shipping are included in emissions reductions targets in the future.

5.24 It is intended that budgets would only be reviewed where there were significant changes in circumstances[30], in order to maintain the certainty they provide in terms of the emissions reduction trajectory. We also propose that budgets should only be amended following open and transparent advice from the independent Committee on Climate Change and with the agreement of Parliament, via the affirmative resolution procedure.

5.25 This differentiated level of flexibility is intended to ensure the integrity of the framework, striking a balance between certainty and flexibility. Too rigid, and the unilateral framework risks being too costly and possibly have to be significantly amended in future; too flexible, and there will be insufficient clarity in the Government's intentions. The Government believes these arrangements strike the right balance.

Question 5: Do you agree there should be a power to review targets through secondary legislation, to ensure there is sufficient flexibility in the system?

Question 6: Are there any factors in addition to, or instead of, those already set out that should enable a review of targets and budgets?

Counting overseas credits towards the budgets and targets

5.26 A strong message from last year's Stern Review is that co-ordinated multilateral action is important and the cost of emissions reductions can be substantially reduced by allowing trading of emissions reductions as the means to utilise least cost abatement opportunities without environmental costs. This is the principle behind the various flexible mechanisms found in the Kyoto Protocol, as described in Box 4.

[30] For example inclusion of CO_2 emissions from aviation within the EU ETS; or a significant long term shift in fuel prices which changed the basis of the emissions forecasts on which the budget(s) had initially been set.

Box 4: *The Kyoto Protocol and flexible mechanisms*

The Kyoto Protocol[31] provides countries that have adopted targets with a number of ways to meet them, through international emissions trading and 'flexible' mechanisms (explained below). Through these mechanisms the Protocol creates a system whereby emissions reductions may occur at the least cost location, the net effect being a reduction in global greenhouse gas emissions.

The Kyoto flexible mechanisms, the Clean Development Mechanism (CDM) and Joint Implementation (JI), allow for countries with a Kyoto target to participate in projects that abate emissions in another country. The credits generated (where each is worth one tonne of CO_2e abated) can then be used to meet the participating country's Kyoto target.

The CDM provides for countries with a Kyoto target ("Annex I" countries) to carry out projects in developing countries which do not have a reduction commitment ("non-Annex I" countries). These projects reduce emissions and may have additional sustainable development benefits. The 2006 DfID White Paper on International Development[32] set out the Government's objectives regarding deployment of low-carbon technology in developing countries and CDM projects play an important role in this regard.

JI allows a country with a reduction target under Kyoto to purchase credits generated by a project to reduce emissions in another country covered by a Kyoto target.

Further information on CDM and JI is available from the Defra website:

- http://www.defra.gov.uk/environment/climatechange/internat/kyotomech/cdm.htm
- http://www.defra.gov.uk/environment/climatechange/internat/kyotomech/ji.htm

5.27 The EU, with a strong lead from the UK, has built on the Kyoto Protocol to take the world's most significant step in that direction by establishing the EU Emissions Trading Scheme. The UK is committed to building on the EU ETS as its main way of pricing carbon in the economy, to ensure that emissions are effectively limited. The scheme already covers approximately half of the UK and EU's CO_2 emissions, including emissions from electricity production. Its introduction in 2005 has led to the creation of a growing carbon market, valuing carbon by placing a limit on the overall quantity of carbon dioxide which can be emitted. In 2006 the carbon market was estimated to be worth €22.5bn globally, and €18.1bn for the EU ETS. The scheme is described in further detail in Box 5.

[31] Please see http://unfccc.int/kyoto_protocol/items/2830.php for further details.
[32] "Eliminating World Poverty: making governance work for the poor". Available from: http://www.dfid.gov.uk/wp2006/default.asp

Box 5: *The EU Emissions Trading Scheme (EU ETS)*

The EU ETS is one of the key policies introduced by the European Commission to help meet the EU's 8% greenhouse gas emissions reduction target under the Kyoto Protocol. The Scheme covers energy activities (e.g. boilers, electricity generation, CHP); production and processing of ferrous metals; mineral industries; pulp and paper industries.

The EU ETS uses a market-based mechanism to incentivise the reduction of greenhouse gas emissions in a cost-effective and economically efficient manner. The Scheme operates through the allocation and trade of greenhouse gas emissions allowances throughout the EU, where one allowance represents one tonne of CO_2 equivalent. An overall limit or "cap" is set by each Member State on the total number of allowances to issue to installations in the Scheme, based on the member state's Kyoto and/or national emissions reduction target.

At the end of each year, the scheme's participants (i.e. individual companies) are required to ensure they have sufficient allowances to account for their installation's actual emissions. They have the flexibility to buy additional allowances above their allocation, or to sell any surplus allowances generated by reducing their emissions below their allocation. The buying and selling of allowances takes place on an EU-wide market, and under the rules of the Scheme there is no restriction placed on where within the EU allowances are sourced, or how many may be purchased to cover actual emissions. All transfers are recorded in electronic national registries.

The Linking Directive amends the EU ETS Directive and provides for the use of credits from the Kyoto Protocol's flexible mechanism for compliance purposes in the EU ETS. Use of these credits are required to be restricted up to the limit set out in each member state's national allocation plan.

Further information on the EU ETS is available from the following web pages:

- Defra: http://www.defra.gov.uk/environment/climatechange/trading/eu/index.htm
- European Commission: http://ec.europa.eu/environment/climat/emission.htm

5.28 Kyoto's flexible mechanisms and the EU ETS are very important in terms of achieving emissions reductions at least cost, as well as providing a means of co-ordinating international action, and a conduit for helping developing countries achieve low carbon economies. It is important that the targets and budgets in this Bill do not restrict the UK or UK organisations from using these mechanisms. We therefore propose that the Bill should allow emissions reductions achieved overseas but paid for by UK entities to be counted towards the targets and budgets.

5.29 This does not mean that all (or an unlimited amount of) emissions reduction effort should or would be achieved overseas. There is considerable potential for cost-effective measures to reduce emissions in the UK, and the Government is actively pursuing programmes such as the Energy Efficiency Commitment to help deliver these. Guidance on the degree to which emissions reductions should be achieved domestically are contained in the international principle of 'supplementarity'[33] which states that:

[33] Located in the **Marrakesh Accords** - a set of agreements reached at the Conference of the Parties 7 (COP7) meeting in 2001 on the rules of meeting the targets set out in the Kyoto Protocol.

*"...the use of the [Kyoto project] mechanisms shall be **supplemental** to domestic action and…domestic action shall thus constitute a significant element of the effort made by each Party…"* .

5.30 This principle is primarily intended to demonstrate to developing countries that industrialised countries are willing to take positive action domestically and make real efforts to reduce their own emissions, rather than expecting others to make all the reductions for them. The principle also guards against the possibility of rich developed countries buying the least cost emissions reductions from countries which may in the future take on their own targets, but for which few or no cheap and easy emissions reductions remain.

5.31 There is a lack of clarity over what precisely the supplementarity principle means in terms of a quantitative limit on emissions reduction effort which can be achieved overseas. For one thing, no quantitative limit is explicitly given in the guidance. For another, the principle refers only to Kyoto project mechanisms (CDM and JI) for complying with Kyoto obligations, whereas it is also the case that EU ETS allowances purchased overseas are strictly speaking international rather than domestic effort. As stated in Box 5 there is no limit on the degree to which organisations within the EU ETS system can reduce their emissions through purchasing allowances, many or all of which could come from other EU Member States.

5.32 As noted above, the Stern Review pointed to the environmental and economic advantages of international carbon trading in ensuring that ambitious reduction targets can be delivered at least cost, and noted the advantages of distinguishing between the overall level of responsibility for reducing global emissions that each country undertakes, rather than the emissions reductions that are required to physically occur within its borders, commenting that this distinction can drive investment flows globally that can make it possible for developing countries to limit their emissions far below the levels they would otherwise be expected to reach. This is one of the reasons the Government believes it appropriate to adopt a target based on the "net UK carbon account."

5.33 Allowances and credits may be purchased from overseas by a range of entities – organisations, individuals, and the Government. The Government may deem it appropriate to purchase credits from overseas itself, in order that it can count these credits towards meeting the UK's targets and budgets. Several other governments are already adopting this approach. In addition to those UK entities that are already able to purchase credits, the Government is therefore seeking authorisation in the Bill to spend money on overseas credits and allowances, to help the UK to remain within budget if necessary.

5.34 As well as how much effort is allowed to be achieved overseas, there is uncertainty regarding the post-2012 international framework, in terms of what *types* of credits may be counted as legitimate emissions reductions. In the future new types of overseas credits (in addition to those currently specified) may become available for use under a new framework. Furthermore, an increasing number of countries and regions are developing and proposing emissions

trading schemes (e.g. Norway, Switzerland, Japan and state-level schemes in the US and Australia). Properly constructed links to such schemes would increase the liquidity of the carbon market, and benefit all participants and the wider public interest. It is not yet clear how these links would be made, but it will be important for the UK to support such global efforts and allow UK organisations to benefit from them.

5.35 The Bill therefore contains a duty on Government to produce regulations setting out the types of overseas credits that can count towards the UK carbon budget and emissions reduction targets, and the amount of carbon dioxide emissions reductions that each type of credit represents. This measure will provide clarity as to what limits there are on the types of emissions reduction credits that can be counted towards the UK's legislated targets and budgets. In addition, it is proposed that the Committee on Climate Change should have a duty to advise the Government, as part of its advice on the level of carbon budgets, on the optimal balance between domestic and overseas effort to inform the Government's decision-making.

Question 7: Do you agree that, in line with the analysis in the Stern Review and with the operation of the Kyoto Protocol and EU ETS, effort purchased by the UK from other countries should be eligible in contributing towards UK emissions reductions, within the limits set under international law?

Banking

5.36 The Stern Review emphasises the importance of flexibility when designing policies to reduce the impact of climate change. In general, some flexibility in the timing of emissions reductions is desirable in order to respond to unforeseen circumstances.

5.37 As discussed above, this flexibility is a key driver behind the decision to propose five year carbon budgets as opposed to a trajectory of specific CO_2 emissions targets for each year.

5.38 Building on this, we believe that any emissions reductions which exceed those budgeted for could be "banked", for use in the next budget period. This would make it easier to meet the next budget and provide an incentive for early action and over-performance in earlier budget periods. In essence, banking provides an incentive to achieve continuous emissions reductions, and avoids losing the benefits of over-performance between budget periods. The Kyoto Protocol currently follows this principle and allows some unused emissions rights to be banked for future use (see section 5 in the RIA).

Question 8: Do you agree it should be permissible to carry over any surplus in the budget? Are there any specific circumstances where you consider this provision should be withdrawn?

Borrowing

5.39 As set out above, we believe that the system of carbon management should have a degree of flexibility in order to accommodate inevitable uncertainties about the future. This is particularly important when acting unilaterally.

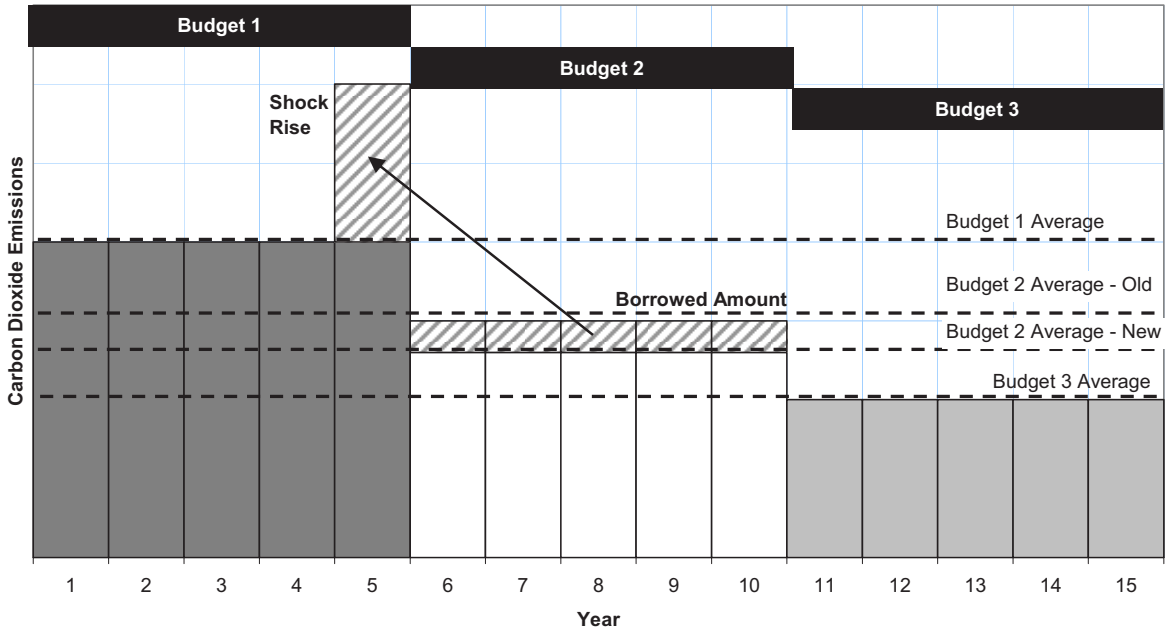
5.40 In any budget period the Government considers it should be able to borrow a limited quantity of emissions rights from the subsequent period. In practice this means increasing the current budget by a certain amount, and reducing the next period's budget by the same amount.

5.41 This would help to ensure that a carbon budget would not be 'missed' due to, for example, an unexpectedly cold winter in the last year of the budget, as a result of which there could be increased CO_2 emissions due to increased gas demand, and insufficient time to compensate for this before the end of the budget period (at least not without taking measures which would impose very high costs, for comparatively small long term environmental benefit). Another scenario in which limited borrowing might be appropriate would be to make end of period adjustments, for example where data changes occurred after the close of a budget period (when final validated data becomes available for the final two years of the budget period that could differ from provisional data). Borrowing provides the flexibility to deal with such unexpected events whilst not affecting cumulative emissions.

5.42 As an illustration, figure 4 shows how the excess emissions in budget one are covered by borrowing emissions from 'budget two'. 'Budget two is as a result lowered to reflect the amount borrowed. If the actual emissions in budget two are less than its new (lower) limit, then total emissions over budgets one and two remain unchanged. Borrowing maybe attractive as it allows time to introduce new actions and policies to respond to unexpected events.

Figure 4

Carbon Budgeting - Inter Budget Flexibility; Borrowing



5.43 On the other hand, borrowing should be strictly limited to ensure the budget from which emissions are borrowed is not unduly diminished, and certainty in the level of future budgets not undermined. Our analysis indicates (as set out in the RIA) that a borrowing limit of 1% of the subsequent budget period would provide sufficient flexibility to accommodate such variations, whilst at the same time not making future budgets unduly difficult to meet. The decision to borrow would obviously not be taken lightly as it is important to maintain the credibility and integrity of the framework. We therefore propose that the Government should first seek, and take account of, advice from the independent Committee on Climate Change (see following section for details). Furthermore, the ability to borrow would be constrained by the necessity of meeting the targets laid down for the 2018-2022 budget and for 2050, targets which can only be altered in very limited circumstances.

Question 9: Do you agree that limited borrowing between budget periods should be allowed?

Compliance with Carbon Budgets and Targets

5.44 This legislation puts a legal duty on the Government to ensure that the UK meets its targets and stays within the limits of its carbon budgets (subject to provisions on banking and borrowing). This legal duty would mean that a Government which fails to meet its targets or stay within budget would be open to Judicial Review (JR).

5.45 In addition to this specific legal consequence, the legislation also seeks to create a transparent reporting framework within which the Government's activity and actions towards meeting its targets and keeping to budget can be continually monitored, and which makes the Government continually accountable to the public and to Parliament. The precise measures constitute the 'Reporting' element of the Bill (see below for further details).

5.46 With this system in place, both this Government and future Governments should have clear incentives to carry out the necessary actions to keep to their targets and within their budgets.

Question 10: Is it right that the Government should have a legal duty to stay within the limits of its carbon budgets?

Devolution

5.47 Targets and carbon budgets will affect all parts of the UK and impact on both devolved and reserved policies. In developing the final Bill the Government and the Devolved Administrations will need to consider how this should be reflected in the process of agreeing and revising budgets and targets.

The Committee on Climate Change

The need for an independent analytical organisation

5.48 There are a number of different emissions reduction pathways to our long term target of 60% CO_2 emissions reduction by 2050. Choices between these paths must balance the need for urgent action to tackle climate change and the UK's desire to show international leadership, with the need to maintain a strong economy.

5.49 The Government already produces very detailed analysis on a number of climate change issues, including a detailed Emissions Inventory and projections to 2020 to fulfil its international reporting commitments, and policy appraisals to show the cost-effectiveness and impact of different policy measures.

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5.50 Balancing these considerations is a complex and technical task. It is therefore important that, in formulating scenarios of how the UK will achieve its emissions reductions goals, Government, businesses, the public and other stakeholders have access to expert independent analysis. It is imperative that this analysis is clear, transparent and independent of Government so that – irrespective of the Government of the day – the analysis is seen as objective and free from political interference, which would otherwise potentially damage its credibility.

5.51 We therefore propose to establish a new non-departmental public body (NDPB), the Committee on Climate Change, to independently assess how the UK can optimally achieve its emissions reductions goals[34].

Question 11: Do you agree that establishing an independent body will improve the institutional framework for managing carbon in the economy?

Functions of the Committee on Climate Change

5.52 It is intended that the Committee on Climate Change will advise Government on the level of carbon budgets appropriate to meeting its legislated targets. In recommending the level of the first three carbon budgets, the Committee on Climate Change would also be required to advise the Government on whether its recommended budget for 2008-12 is consistent with the Government's existing 2010 target of a 20% CO_2 emissions reduction compared to 1990 levels, and the costs and benefits of achieving such a budget. The 2010 target to cut CO_2 emissions by 20% (which was designed to be far more stretching than our Kyoto commitment of a 12.5% GHG emissions reduction) remains a Government objective, albeit one which now looks very challenging to meet. It is therefore important that the Government receive advice from the Committee as to whether the optimal pathway towards achieving the medium and long term targets set in statute by this Bill are consistent with this 2010 target.

5.53 The Committee will also advise on:

[34] It is proposed that the Committee on Climate Change will also be responsible for independently assessing the UK's progress towards meeting its goals, as discussed in the reporting section below.

- The extent to which carbon budgets should be met by domestic emissions reductions versus emissions reductions purchased overseas (as discussed in paragraphs above);
- the respective contributions towards meeting the budgets of those sectors of the economy covered by trading schemes; and,
- the contribution towards meeting the budget of those sectors not covered by trading schemes.

5.54 Furthermore, the Committee would advise Government publicly before it sought to use banking or borrowing facilities (as outlined above), and could be required to provide any other advice relating to climate change on request from the Government. A specific example of this regards advice to the Government about whether to provide for targets and budgets for emissions of GHGs other than CO_2 (as discussed in above). The Committee will perform a technical (or analytical) role which in broad terms will consider how to achieve CO_2 emissions reductions as cost-effectively as possible.

Question 12: Do you agree that the Committee on Climate Change should have an advisory function regarding the pathway to 2050?

Question 13: Do you agree with the proposal that the Committee on Climate Change should have a strongly analytical role?

Factors for the Committee on Climate Change to consider

5.55 The Committee will be tasked with providing its assessment of the optimum abatement pathway which is consistent with the 2020 and 2050 targets and the UK's international obligations. Clearly the optimal pathway will depend on the objectives that should be achieved in reducing emissions. This means that the Committee should be asked to take specific factors into account in order that the positive impacts on these factors be maximised, and negative impacts minimised, in setting the emissions reduction pathway. These factors (as detailed in above) are:

(a) scientific knowledge about climate change;
(b) technology relevant to climate change;
(c) economic circumstances, and in particular the likely impact of the decision on the economy and the competitiveness of particular sectors of the economy;
(d) fiscal circumstances, and in particular the likely impact of the decision on taxation, public spending and public borrowing;
(e) social circumstances, and in particular the likely impact of the decision on fuel poverty;
(f) energy policy, and in particular the likely impact of the decision on energy supplies and the carbon and energy intensity of the UK; and,
(g) international circumstances.

Question 14: Are these the right factors for the Committee on Climate Change to take into account in assessing the emissions reduction pathway? Do you consider there are further factors that the Committee should take into account?

Membership and composition

5.56 We would like the Committee on Climate Change to have a Chair and a Board comprising 5-8 members, supported by a standing secretariat of staff to conduct in-depth analysis into the issues being considered. The Chair would be consulted on the appointment of the members.

5.57 To ensure its credibility it is important that the Committee is able to clearly and rationally present the economics of the costs, benefits and risks of abatement decisions. This means that the Committee's members should be experts in their field, rather than representing specific stakeholder groups, and will be supported by a secretariat with a strong analytical skills base. The following list provides an indication of the types of expertise that will be desirable in the overall composition of the Committee:

(a) economic analysis and forecasting;
(b) business competitiveness;
(c) financial investment;
(d) technology development and diffusion;
(e) energy production and supply;
(f) climate science;
(g) emissions trading; and,
(h) climate change policy in particular its social impacts.

Question 15: Do you agree the Committee on Climate Change should be comprised of technical experts rather than representatives of stakeholder groups?

Question 16: Are these the appropriate areas of expertise which should be considered? Do you consider there are further areas that should be considered or any areas that are less important?

Devolution

5.58 The advice of the Committee on Climate Change will cut across areas of devolved responsibility and the UK Government and the Devolved Administrations will need to consider how this should be reflected in the arrangement for the oversight and governance of the Committee on Climate Change.

Enabling Powers

5.59 Government policies to date have succeeded in keeping CO_2 emissions lower than they might otherwise have been given the growth we have experienced in the economy. However we need to do more to deliver the emissions reductions needed to meet the targets in the Bill. The Government is therefore working to implement further policies to ensure that the UK reduces its emissions and meets the long-term targets in the Bill. Details of these will be set out in the forthcoming Energy White Paper.

5.60 The scale and long-term nature of the challenge and continuing evolution in understanding of how to tackle climate change, however, means that new policies and changes to existing policies are likely to be needed over the coming decade and beyond. Some elements of policy can already be introduced and reviewed relatively quickly. The Government reviews taxation policy every year in the Budget, followed by an annual Finance Bill. But the Government is not able to act equally quickly in relation to other measures. Therefore a key element of the Bill is the creation of new powers to introduce new policies to help us stay within our carbon budgets and meet our targets. These will thus form a key part of the framework created by this Climate Change Bill to manage greenhouse gas emissions over time and across the economy.

Types of policies to reduce emissions

5.61 There are a range of policies available to achieve reductions in emissions. These include tax, voluntary agreements, traditional regulations, awareness raising and trading schemes[35]. All these instruments have a role to play in reducing emissions but have different characteristics. For example tax can be increased on specific activities to reflect the cost of emissions and, where relevant, other negative impacts which they produce and therefore discourage the emissions. This gives certainty that the cost of emissions (and in some cases other negative impacts) is being taken into account but does not guarantee a fixed level of emissions.

5.62 As GHG emissions have an equal impact on global emissions irrespective of where they are created, climate change policy lends itself to the use of trading schemes as a way of achieving environmental objectives at the least cost.

Box 6: *What are trading schemes?*
These type of policies fix a policy objective but allow participants to determine the cheapest and easiest way to meet it. For example, in *'cap and trade'* schemes where an emissions cap has been imposed on all participants, an individual company might reduce their emissions by reducing their consumption of fuel (by reducing waste or by developing new technology), or they might trade with another participant who can reduce their emissions more cheaply. Similarly where participants are given an *obligation* to supply a specific percentage of their fuel from renewable sources, they can either chose to meet this obligation or trade with others who can meet the obligation more cheaply.

5.63 There are two main potential advantages of this type of policy mechanism. Firstly, there is certainty about the level of carbon dioxide emissions that will be achieved as the outcome is fixed and mechanisms are in place to avoid the outcome not being achieved. This is particularly the case for "cap and trade" schemes. Secondly, trading allows participants to reduce emissions where it is cost-effective to do so and trade where it is cheaper for others to do so therefore reducing emissions at least cost, so long as the costs of participating in administering and enforcing the scheme are proportionate. This type of mechanism has also proved successful in other policy areas. For example, a

[35] Please see Box 6 for further details of trading schemes.

tradable permit regime was introduced to limit oil discharges in the UK offshore gas and oil industry as this was felt to be the best option for minimising costs while still giving a high degree of certainty that the UK's international obligations will be met. The scheme was fully supported by the industry.

5.64 In deciding the most appropriate policies for controlling and pricing emission, the Government takes account a range of factors including:

- the relative cost-effectiveness of emissions reductions;
- social objectives, including reducing fuel poverty;
- the impact on the competitiveness of the UK economy and firms within it;
- the optimal balance for raising the revenue needed to fund public services from across the economy; and,
- the availability of benefits in other policy areas – for example in terms of security of energy supply, or in reductions in emissions of air quality pollutants.

How can trading schemes be applied?

5.65 The majority of carbon dioxide emitted by the UK comes from burning fossil fuels (principally oil, gas and coal) for three activities – to create electricity, to power vehicles and to provide heat. A reduction in the amount emitted can be achieved by reducing demand for energy, reducing the amount of carbon dioxide released for each unit of energy consumed or a combination of both.

5.66 Trading schemes can be applied to different points in the fuel supply chain depending on the outcome sought and optimal administrative arrangements. So policies can be applied *upstream* at the point at which fuel is sold for combustion or supplied into the market or *downstream* at the point of final consumption of the fuel. Different policies can simultaneously be placed up and downstream in the same sector where this is judged to address particular market failures and uncover additional carbon savings.

5.67 Emissions from both upstream and downstream consumers can also be both direct and indirect. So for example a consumer will directly emit carbon dioxide when powering their car and heating their home but indirectly emit carbon dioxide when using electricity (as the emissions occur at the point at which electricity was created rather than consumed).

Extending the suite of domestic trading schemes

5.68 There are a number of domestic trading schemes already in place across the UK economy, as shown in Box 7.

Box 7: *Existing UK trading schemes*

The **EU Emissions Trading Scheme** puts a cap on emissions by electricity producers and others including ferrous metals, mineral and pulp and paper industries, while the **Renewables Obligation** puts an obligation on electricity producers to supply a specific amount of electricity from renewable sources. **Climate Change Agreements** negotiated with energy intensive sectors set out emissions reduction targets. The **Energy Efficiency Commitmen**t puts an obligation on electricity and gas supplies to offer energy efficiency measures to their customers. The proposed Energy Performance Commitment would put a cap on emissions from non-energy intensive commercial and industrial users.

All these policies with the exception of the Renewables Obligation also apply to parts of the heat sector, although coverage is less comprehensive than in the electricity sector.

The **Renewable Transport Fuel Obligation (RTFO)** is due to be introduced into the transport sector in 2008. It will be similar to the Renewables Obligation. The RTFO will require the road transport and fuel suppliers to ensure that a proportion of their road fuel sales are from a renewable source, like bio fuels.

5.69 Government's long-term aim is to build on the EU ETS by extending the application of the scheme to cover new sectors and gases[36]. However it is not certain that all sectors will be appropriate for inclusion or that the EU will reach agreement. Government may want to take domestic action ahead of the EU where it is cost effective and necessary to reduce UK emissions and will help sectors to prepare for inclusion in ETS. Government may also wish to supplement EU level action and introduce its own policies to uncover efficiencies and support clean technologies.

5.70 Such policies might or might not be in the form of trading schemes, but it is possible that in coming years Government may consider implementing *upstream* schemes to supplement the EU ETS, implementing schemes for emissions on downstream energy use and implement schemes to support cleaner technologies and fuels. Government is also likely to need to make improvements to existing schemes as our understanding of climate change develops.

5.71 Government is therefore proposing to take **enabling powers** to make it easier to implement new trading schemes as well as consolidate, and extend trading schemes more easily.

Question 17: Do you agree with the principle of taking enabling powers to introduce new trading schemes?

[36] http://www.hm-treasury.gov.uk/media/98D/4B/environment_emissionstrading301006.pdf

Benefits and structure of enabling powers

5.72 The building blocks of trading schemes in different sectors and to meet different objectives are very similar and therefore make it possible to take broad powers to introduce them through secondary rather than primary legislation. Taking these powers will make policy-making more responsive by avoiding the need for new and separate primary legislation to introduce any future schemes. This does not mean less analysis, scrutiny or consultation before a decision to implement a new scheme but will reduce the time and cost to the UK of developing and scrutinising the same building blocks again and again. This frees up time to consider the policy itself.

5.73 Taking powers does not mean a presumption against the use of taxes or non-traded policy instruments where they are more appropriate. Nor does it compel Government to introduce specific policies. It simply addresses a gap in existing powers: changes to the taxation system can be introduced quickly through the annual Finance Bill process, and EU measures can be implemented using the European Communities Act 1972 without the need for new legislation. These proposed enabling powers would enable other climate change mechanisms to be established (or adjusted) to a similar timeframe.

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5.74 The powers in the Bill cover the following design elements and would enable the Government to:

- introduce trading schemes to uncover carbon savings;
- define persons to which the scheme applies;
- set targets / level of obligations;
- define units to be traded;
- allocate tradable units to participants without charge;
- define trading periods;
- create compliance mechanisms and appropriate penalties;
- establish an appeals process;
- appoint an administrator and / or regulator for the scheme;
- set out provisions should participants exit from the scheme;
- link to other domestic and global trading schemes; and,
- allow the administrator to obtain data to verify emissions.

5.75 The Government is investigating the feasibility of taking a power to allow scheme administrators to access data already collected by Government for different purposes but currently protected by legal restrictions. This power could help reduce the administrative costs of trading schemes for both Government and participants.

5.76 The allocation of allowances within a trading scheme can happen in a number of ways. Powers in the Climate Change Bill would permit the allowances to be allocated free of charge, whilst allocation by auction or otherwise for value is intended to be taken forward on a case by case basis in the annual Finance Bill, starting with provisions for auctioning within the EU Emissions Trading Scheme in the 2007 Finance Bill. Powers to introduce measures that generate revenue in some way - such as auctioning - are traditionally taken in the Finance Bill, and there is no need to create new powers in the Climate Change Bill. Each decision about whether to use auctioning will be taken on a case by case basis. As has been the case in the past, the possibility that revenues could be balanced in some way with other measures to benefit participants will be considered during the design stages of any policy, taking into account the wider public interest, including the need to ensure the optimal balance for funding public services from across the economy.

Question 18: Do you consider that these powers are sufficient to introduce effective new policies via secondary legislation? If not, what changes would you make?

Devolution

5.77 The devolved administrations have a role to play in existing trading schemes, for example the powers under which the EU ETS is transposed are largely devolved. The role of the devolved administrations in the proposed new powers will need further consideration.

Reporting

The need for regular, independent monitoring of the UK's progress

5.78 The Government is already legally required to produce an annual assessment of its progress on greenhouse gas emissions reductions, under Section 2 of the Climate Change and Sustainable Energy Act 2006[37]. We would like to provide for the Committee on Climate Change to become involved in this annual reporting process, so as to maximise the independence and credibility of the reporting framework.

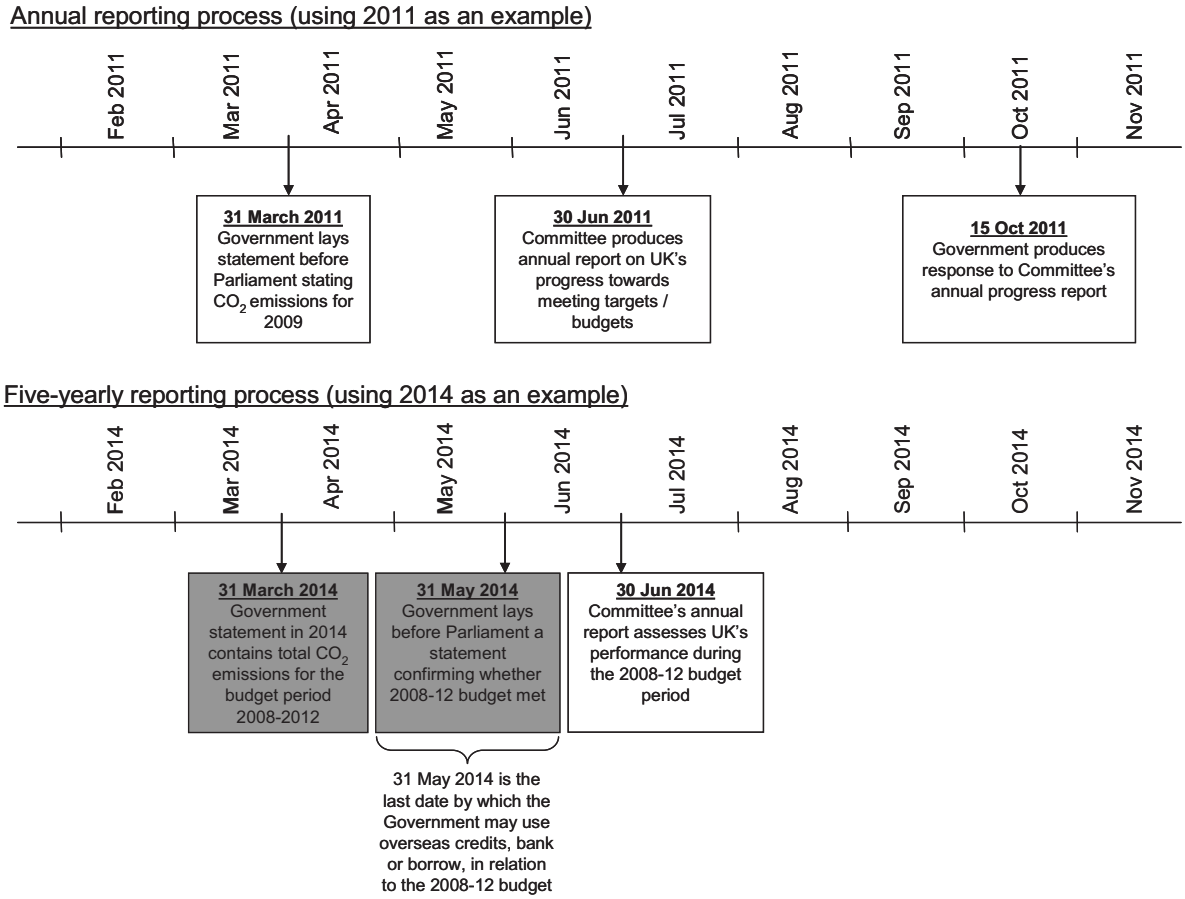
5.79 We therefore propose that the Committee on Climate Change should produce an annual report on the UK's progress towards both its budgets and targets, produced in the summer of each year and including the latest data on emissions in the UK. The report would be placed before Parliament for maximum transparency, and the Government would be required to respond to this report, explaining its actions and outlook on progress in the light of the Committee on Climate Change's report.

[37] Available from: http://www.opsi.gov.uk/ACTS/acts2006/20060019.htm

5.80 In addition, every five years, following the release of the final, validated data to show emissions in the last year of a budget period[38], the Government should lay before Parliament a compliance statement of whether the budget was met. This statement would take account of the Government's decision to offset overseas credits against domestic emissions, as well as any decision to borrow or bank emissions rights. The Committee on Climate Change should then include in its annual report for that year an assessment of the validity of the Government's compliance statement, and the implications of this for current and future actions to stay on track to meet the legislated targets. Figure 5 below outlines the precise reporting timetable.

[38] Due to the international reporting framework there is a two-year time lag on the publication of this final, validated data. Hence for the 2008-12 budget period the comprehensive assessment report would be published in spring 2014.

Figure 5



5.81 We believe that this regular and comprehensive reporting regime will help to strengthen accountability for achieving emissions reductions; and thereby raise expectations that budgets will be met, which in turn will reinforce confidence amongst businesses, households and other stakeholders.

Question 19: Do you agree that the Committee on Climate Change should be responsible for an independent annual report on the UK's progress towards its targets which would incorporate reporting on a completed budget period every five years?

Devolution

5.82 The Scottish Parliament, National Assembly for Wales and Northern Ireland Assembly may also wish to have a role in assessing progress.

Adaptation

5.83 There are currently no legal requirements on the Government to report on or monitor the risks of climate change and the progress the Government is making

in adapting to these risks, but there is growing recognition of the need for a more coherent approach[39].

5.84 To help ensure a transparent framework and a consistent approach to adaptation we are proposing that the Government undertakes a quinquennial review of the risks posed by the impacts of climate change to the UK. This will then help to inform the proposals and policies that Government should develop to ensure that adaptation is integrated into its work.

5.85 In addition to a risk assessment, it is proposed that this report will also outline progress made by Government on developing and implementing measures related to adaptation. The reporting process will allow Government to state its priorities on adaptation (taking into account developments in science, and the current economic and social context), outline measures it is using to incorporate adaptation into its work, and enable stakeholders to see clearly what Government is doing to address adaptation. This will provide a national context to their own adaptation efforts.

5.86 A statutory reporting requirement allows a public examination of the Government's work in this area, without imposing prescriptive measures that risk constraining adaptation activities or even leading to maladaptation as understanding of climate science and the economic situation develops. A Government report to Parliament would allow this flexibility whilst ensuring full public scrutiny and examination of the measures being taken.

Question 20: Is statutory reporting the best way to drive forward progress on adaptation while at the same time ensuring Government is able to develop flexible and appropriate measures reflecting developments in key policy areas?

[39] The overwhelming response to a Government consultation in 2005 on the development of an adaptation policy framework was that this would be useful in helping to co-ordinate adaptation action, both at local level and across Government. It was also felt that the time was right for a national framework to provide strategic direction, outline priority areas for action and develop methods for trying to avoid cross-sectoral inconsistencies

6 Next Steps and how to respond to this consultation

6.1 The UK Government is working to achieve the best means for responding to climate change and this document is designed to stimulate ideas to facilitate that.

6.2 This consultation document forms the core of a 13 week consultation exercise that is being conducted to seek the views of all of those with an interest in a broad range of climate change issues that the UK Government is considering for a Climate Change Bill. This document explains our thinking around the proposed Bill and invites your contributions and comments.

6.3 Following the close of this consultation period on **12 June 2007**, the UK Government and the Devolved Administrations will carefully consider all responses to this consultation exercise when further developing proposals for the Bill. Relevant documents, background to our work on a Climate Change Bill, details of supporting activities and latest updates on progress are all available on http://www.defra.gov.uk/corporate/consult/climatechange-bill/

What consultees are invited to do

6.4 You are welcome to comment on all aspects of this document but there are some specific issues on which we would particularly value your input and these are highlighted by questions throughout the document. It would be helpful if, when you respond, you indicate clearly the specific questions to which your answers relate.

6.5 To aid you in responding, a complete list of the questions asked in this document is presented at **Annex A**. We are also seeking your views on analysis contained within the partial Regulatory Impact Assessment, in particular on: both the high level benefits, costs and uncertainties surrounding the delivery of the proposed system of statutory targets and budgets (outlined in Section 4 of the RIA) as well as the analysis of the options considered as part of the detailed development of the proposed measures (which can be viewed at http://www.defra.gov.uk/corporate/consult/climatechange-bill/).

6.6 When responding to the consultation you may wish to comment on this analysis of costs and benefits, giving supporting evidence wherever possible.

6.7 **The consultation period runs from 13 March 2007 until 12 June 2007.** Please ensure that your response reaches us by **12 June 2007**. We cannot guarantee that responses made after that date will be taken into account. If you would like further copies of this consultation document it can be found at http://www.defra.gov.uk/corporate/consult/climatechange-bill/

Alternatively please call: **08459 33 55 77** or e-mail: climatechangeconsultation@defra.gsi.gov.uk to request a copy.

6.8 When responding to this consultation please state whether you are responding as an individual or representing the views of an organisation. If responding on behalf of a larger organisation please make clear who the organisation represents and where applicable, how the views of members were assembled.

6.9 It will help us if you send your response using the electronic form that is available at http://www.defra.gov.uk/corporate/consult/climatechange-bill/ although any electronic / written format (Microsoft Word is preferable) will be accepted. Please send responses to: E-mail: climatechangeconsultation@defra.gsi.gov.uk

Alternatively, responses can be sent by post to the following address:

Patrick Erwin / James Hardy
Climate Change Legislation Team
Area 4/F5
Ashdown House
123 Victoria Street
London
SW1E 6DE

Confidentiality

6.10 In line with Defra's policy of openness, at the end of the consultation period copies of the responses we receive will be made publicly available through the Defra Information Resource Centre, Lower Ground Floor, Ergon House, 17 Smith Square, London SW1P 3JR. The information they contain will also be published in a summary of responses.

6.11 If you do not consent to this, you must clearly request that your response be treated confidentially. Any confidentiality disclaimer generated by your IT system in e-mail responses will not be treated as such a request. You should also be aware that there may be circumstances in which Defra will be required to communicate information to third parties on request, in order to comply with its obligations under the Freedom of Information Act 2000 and the Environmental Information Regulations.

6.12 The library will supply copies of consultation responses to personal callers or in response to telephone or e-mail requests (tel: 020 7238 6575, email: defra.library@defra.gsi.gov.uk Wherever possible, personal callers should give the library at least 24 hour notice of their requirements. An administrative charge will be made to cover photocopying and postage costs.

6.13 If you have any comments or complaints about the consultation process, as opposed to the content in the consultation paper, please address them to Marjorie Addo, Defra's Consultation Co-ordinator, Area 7B Nobel House, 17 Smith Square, London SW1P 3JR, or email: consultation.coordinator@defra.gsi.gov.uk.

Annex A: Consultation Questions

Consultation Questions

Consultation questions are asked in **Section 5** of this document. To aid you in responding, a complete list of the questions asked is presented below, referenced by question number.

Targets and Budgets

Setting statutory targets

1. Is the Government right to set unilaterally a long-term legal target for reducing CO_2 emissions through domestic and international action by 60% by 2050 and a further interim legal target for 2020 of 26-32%?

2. Is the Government right to keep under review the question of moving to a broader system of greenhouse gas targets and budgets, and to maintain the focus at this stage on CO_2?

Carbon budgeting

3. Should the UK move to a system of carbon management based upon statutory five-year carbon budgets set in secondary legislation?

4. Do you agree there should be at least three budget periods in statute at any one time?

Reviewing targets and budgets

5. Do you agree there should be a power to review targets through secondary legislation, to ensure there is sufficient flexibility in the system?

6. Are there any factors in addition to, or instead of, those already set out that should enable a review of targets and budgets?

Counting overseas credits towards the budgets and targets

7. Do you agree that, in line with the analysis in the Stern Review and with the operation of the Kyoto Protocol and EU ETS, effort purchased by the UK from other countries should be eligible in contributing towards UK emissions reductions, within the limits set under international law?

Banking

8. Do you agree it should be permissible to carry over any surplus in the budget? Are there any specific circumstances where you consider this provision should be withdrawn?

Borrowing

9. Do you agree that limited borrowing between budget periods should be allowed?

Compliance with carbon budgets and targets

10. Is it right that the Government should have a legal duty to stay within the limits of its carbon budgets?

The Committee on Climate Change

The need for an independent analytical organisation

11. Do you agree that establishing an independent body will improve the institutional framework for managing carbon in the economy?

Functions of the Committee on Climate Change

12. Do you agree that the Committee on Climate Change should have an advisory function regarding the pathway to 2050?

13. Do you agree with the proposal that the Committee on Climate Change should have a strongly analytical role?

Factors for the Committee on Climate Change to consider

14. Are these the right factors for the Committee on Climate Change to take into account in assessing the emissions reduction pathway? Do you consider there are further factors that the Committee should take into account?

Membership and composition

15. Do you agree the Committee on Climate Change should be comprised of technical experts rather than representatives of stakeholder groups?

16. Are these the appropriate areas of expertise which should be considered? Do you consider there are further areas that should be considered or any areas that are less important?

Enabling Powers

Extending the suite of domestic trading schemes

17. Do you agree with the principle of taking enabling powers to introduce new trading schemes?

Benefits and structure of enabling powers

18. Do you consider that these powers are sufficient to introduce effective new policies via secondary legislation? If not, what changes would you make?

Reporting

The need for regular, independent monitoring of the UK's progress

19. Do you agree that the Committee on Climate Change should be responsible for an independent annual report on the UK's progress towards its targets which would incorporate reporting on a completed budget period every five years?

Adaptation

20. Is statutory reporting the best way to drive forward progress on adaptation while at the same time ensuring Government is able to develop flexible and appropriate measures reflecting developments in key policy areas?

Annex B: Glossary of terms and abbreviations

Glossary of terms and abbreviations

Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
Anthropogenic	'Human activity' - usually used when explaining man-made emissions.
Clean Development Mechanism (CDM)	The project mechanism provided for under Article 12 of the Kyoto Protocol. These are projects in developing countries which reduce emissions of greenhouse gases or enhance sinks.
CO_2	Carbon Dioxide.
CO_2e	For the purposes of this Bill greenhouse gas emissions, reductions of such emissions and removals of greenhouse gas from the atmosphere, shall be measured or calculated in tonnes of carbon dioxide equivalent. A tonne of carbon dioxide equivalent means one metric tonne of carbon dioxide or an amount of any other greenhouse gas with an equivalent global warming potential (calculated consistently with international carbon reporting practice).
EU ETS	European Union Emissions Trading Scheme.
GDP	Gross Domestic Product
G8	Group of 8 of the world's major industrialised economies (Canada, France, Germany, Italy, Japan, Russia, UK, USA), with the European Commission also represented at meetings.
GHG	Greenhouse gas. Under the Kyoto Protocol these include CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).
IPCC	Intergovernmental Panel on Climate Change: A UN body set up to "*assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.*" For further details please see: http://www.ipcc.ch/
Joint Implementation (JI)	The project mechanism provided for under Article 6 of the Kyoto Protocol. These are projects undertaken in developed countries with targets which reduce emissions of greenhouse gases or enhance sinks.
Kyoto Protocol	The Kyoto Protocol to the UNFCCC. Negotiated in Japan in 1997, it came into force in February 2005. Among other things, the Protocol sets binding targets for the reduction of greenhouse gas emissions by industrialized countries.
Marrakesh Accords	Agreements reached in 2001 which set out the detailed provisions building on provisions of the Kyoto Protocol, including those relating to supplementarity, CDM and JI.

Mitigation	An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases.
NDPB	Non-Departmental Public Body: a body which has a role in the processes of national government but is not a government department, or part of one, and which accordingly operates to a greater or lesser extent at arm's length from ministers.
ppm	Parts per million: measurement of atmospheric concentration of greenhouse gas.
Project mechanisms	Collective term for CDM and JI.
RIA	Regulatory Impact Assessment
Sinks	Any process, activity, or mechanism that removes carbon dioxide from the atmosphere.
Supplementarity	The principle that the use of the project mechanisms should be supplemental to domestic action to reduce greenhouse gas emissions.
Trading schemes	These type of policies fix a policy objective but allow participants to determine the cheapest and easiest way to meet it, for example, *'cap and trade'* schemes.
UNFCCC	United Nations Framework Convention on Climate Change. 189 countries around the world have joined this international treaty that sets general goals and rules for confronting climate change. The Convention sets an ultimate objective of stabilizing greenhouse gas emissions "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system." As a "framework" document it is something to be amended or augmented over time. Further information is available from: http://unfccc.int

Climate Change Bill

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TO

Set a target for the year 2050 for the reduction of carbon dioxide emissions; to provide for a system of carbon budgeting; to establish a Committee on Climate Change; to confer powers to establish trading schemes for the purpose of limiting greenhouse gas emissions or encouraging activities that reduce such emissions or remove greenhouse gas from the atmosphere; to make other provision about climate change; and for connected purposes.

BE IT ENACTED by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

PART 1

CARBON TARGET AND BUDGETING

The target for 2050

1 The target for 2050

(1) It is the duty of the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 60% lower than the 1990 baseline.

(2) "The 1990 baseline" means the amount of net UK carbon dioxide emissions for the year 1990.

(3) The Secretary of State may by order amend the percentage specified in subsection (1).

(4) That power may only be exercised if it appears to the Secretary of State that there have been significant developments—

(a) in scientific knowledge about climate change, or

(b) in international law or policy,

that make it appropriate to do so.

(5) An order under this section is subject to affirmative resolution procedure.

Carbon budgeting

2 Carbon budgets

(1) It is the duty of the Secretary of State—

(a) to set for each succeeding period of five years beginning with the period 2008-2012 ("budgetary periods") an amount for the net UK carbon account (the "carbon budget"), and

(b) to ensure that the net UK carbon account for a budgetary period does not exceed the carbon budget.

(2) The carbon budget for a budgetary period may be set at any time after this Act comes into force, and must be set—

(a) for the periods 2008-12, 2013-2017 and 2018-2022, before 31st December 2008;

(b) for any later period, not later than 30th June in the 12th year before the beginning of the period in question.

3 Level of carbon budgets

(1) The carbon budget—

(a) for the budgetary period including the year 2020, must be such that the annual equivalent of the carbon budget for the period is at least 26%, but not more than 32%, lower than the 1990 baseline;

(b) for the budgetary period including the year 2050, must be such that the annual equivalent of the carbon budget for the period is lower than the 1990 baseline by at least the percentage specified in section 1 (the target for 2050);

(c) for the budgetary period including any later year specified by order of the Secretary of State, must be such that the annual equivalent of the carbon budget for the period is at least the minimum percentage so specified, but not more than the maximum percentage so specified, lower than the 1990 baseline.

(2) The "annual equivalent", in relation to the carbon budget for a period, means the amount of the carbon budget for the period divided by the number of years in the period.

(3) The Secretary of State may by order amend—

(a) the percentages specified in subsection (1)(a);

(b) any percentages specified under subsection (1)(c).

(4) That power may only be exercised if it appears to the Secretary of State that there have been significant developments—

(a) in scientific knowledge about climate change, or

(b) in international law or policy,

that make it appropriate to do so.

(5) An order under this section is subject to affirmative resolution procedure.

4 Setting of carbon budgets for budgetary periods

(1) The Secretary of State must set the carbon budget for a budgetary period by order.

(2) The carbon budget for a period must be set with a view to meeting—

(a) the target in section 1 (the target for 2050), and

(b) the requirements of section 3 (requirements as to level of carbon budgets),

and complying with the international obligations of the United Kingdom.

(3) In making any decision as to the level of the carbon budget for a budgetary period, the Secretary of State must take into account the advice of the Committee on Climate Change.

(4) An order setting a carbon budget is subject to affirmative resolution procedure.

5 Matters to be taken into account in connection with carbon budgets

(1) The following matters must be taken into account—

(a) by the Secretary of State in coming to any decision under this Part relating to carbon budgets, and

(b) by the Committee on Climate Change in considering its advice in relation to any such decision.

(2) The matters to be taken into account are—

(a) scientific knowledge about climate change;

(b) technology relevant to climate change;

(c) economic circumstances, and in particular the likely impact of the decision on the economy and the competitiveness of particular sectors of the economy;

(d) fiscal circumstances, and in particular the likely impact of the decision on taxation, public spending and public borrowing;

(e) social circumstances, and in particular the likely impact of the decision on fuel poverty;

(f) energy policy, and in particular the likely impact of the decision on energy supplies and the carbon and energy intensity of the economy;

(g) international circumstances.

(3) Nothing in this section is to be read as restricting the matters that the Secretary of State or the Committee may take into account.

6 Duty to report on proposals and policies for meeting carbon budgets

It is the duty of the Secretary of State to lay before Parliament, as soon as is reasonably practicable after making an order setting the carbon budget for a budgetary period, a report setting out the proposals and policies of Her Majesty's Government in the United Kingdom for meeting the carbon budgets for the current and future budgetary periods up to and including that period.

Determination whether objectives met

7 Annual statement of UK emissions

(1) It is the duty of the Secretary of State to lay before Parliament in respect of each year, beginning with the year 2008, a statement containing the following information.

(2) It must—

(a) state the amount for the year of UK carbon dioxide emissions, UK carbon dioxide removals and net UK carbon dioxide emissions, and

(b) identify the methods used to measure or calculate those amounts.

(3) If in accordance with international carbon reporting practice a change of method is such as to require adjustment of an amount for an earlier year in the same budgetary period, it must specify the adjustment required and state the adjusted amount.

(4) It must—

(a) state the total amount of carbon credits used (as at the date of the statement) towards meeting the carbon budget for the budgetary period in which the year falls, and

(b) give details of the number and type of those carbon credits.

(5) It must state the total amount of carbon debits that (as at the date of the statement) fall to be taken into account in determining the net UK carbon account for the budgetary period in which the year falls.

(6) It must state the amount (as at the date of the statement) of the net UK carbon account for the budgetary period in which the year falls.

(7) The statement required by this section must be laid before Parliament not later than 31st March in the second year following that to which it relates.

8 Powers to carry amounts from one budgetary period to another

(1) The Secretary of State may decide to carry back part of the carbon budget for a budgetary period to the preceding budgetary period.

The carbon budget for the later period is reduced, and that for the earlier period increased, by the amount carried back.

(2) The amount carried back under subsection (1) must not exceed 1% of the carbon budget for the later period.

(3) The Secretary of State may decide to carry forward the whole or part of any amount by which the carbon budget for a budgetary period exceeds the net UK carbon account for the period.

The amount of the carbon budget for the next budgetary period is increased by the amount carried forward.

(4) Before deciding to carry an amount back or forward under this section, the Secretary of State must obtain, and take into account, the advice of the Committee on Climate Change.

(5) Any such decision must be made no later than 31st May in the second year after the end of the earlier of the two budgetary periods affected.

9 Final figures for budgetary period

(1) It is the duty of the Secretary of State to lay before Parliament in respect of each budgetary period a statement containing the following information.

(2) It must state the final amount for the period of UK carbon dioxide emissions, UK carbon dioxide removals and net UK carbon dioxide emissions.

That is the total of the amounts (or adjusted amounts) stated under section 7 (annual statement of UK emissions) for the years included in the period.

(3) It must—

(a) state the final amount of carbon credits used towards meeting the carbon budget for the period, and

(b) give details of the number and type of those carbon credits.

(4) It must state the final amount of carbon debits to be taken into account in determining the net UK carbon account for the period.

(5) It must state the final amount of the net UK carbon account for the period.

(6) It must state whether the Secretary of State has decided to carry an amount back under section 8(1) (power to carry amount back from the budget for the next budgetary period), and if so what amount.

(7) It must state the amount of the carbon budget for the period.

That is the amount originally set, subject to—

(a) any exercise of the powers conferred by section 8 (powers to carry amounts from one budgetary period to another), and

(b) any alteration of the budget under section 13.

(8) Whether the carbon budget for the period has been met shall be determined by reference to the figures given in the statement laid before Parliament under this section.

(9) The statement required by this section must be laid before Parliament not later than 31st May in the second year following the end of the period to which it relates.

10 Final figures for 2050

(1) It is the duty of the Secretary of State to lay before Parliament in respect of the year 2050 a statement containing the following information.

(2) It must state the amount for that year of UK carbon dioxide emissions, UK carbon dioxide removals and net UK carbon dioxide emissions.

That is the amount stated for that year under section 7 (annual statement of UK emissions).

(3) It must—

(a) state the amount of carbon credits used to offset those emissions, and

(b) give details of the number and type of those carbon credits.

(4) It must state the amount of carbon debits to be taken into account in determining the net UK carbon account for that year.

(5) It must state the amount of the net UK carbon account for that year.

(6) Whether the target in section 1 (the target for 2050) has been met shall be determined by reference to the figures given in the statement laid before Parliament under this section.

(7) The statement required by this section must be laid before Parliament not later than 31st May 2052.

Supplementary provisions

11 Response to Committee's reports on progress

(1) The Secretary of State must lay before Parliament a response to each report of the Committee on Climate Change under section 21 (reports on progress).

(2) The response must be laid before Parliament not later than 15th October in the year in which the Committee's report is made.

(3) The Secretary of State may by order extend that period.

(4) Any such order is subject to negative resolution procedure.

12 Alteration of budgetary periods

(1) The Secretary of State may by order amend section 2(1)(a) so as to alter—
(a) the length of the budgetary periods, or
(b) the dates in the calendar year on which the budgetary periods begin and end.

(2) This power may only be exercised if it appears to the Secretary of State necessary to do so in order to keep the budgetary periods under this Part in line with similar periods under any international agreement to which the United Kingdom is a party.

(3) The power may not be exercised in such a way that any period falls outside a budgetary period.

(4) An order may make such consequential amendments of the provisions of this Act as appear to the Secretary of State to be necessary or expedient.

(5) An order under this section is subject to affirmative resolution procedure.

13 Alteration of carbon budgets

(1) An order setting the carbon budget for a period may not be revoked after the date by which a budget for the period was required to be set.

(2) The Secretary of State may alter a carbon budget only after obtaining, and taking into account, the advice of the Committee on Climate Change.

(3) An order setting the carbon budget for a period may be amended after the date by which a budget for the period was required to be set only if it appears to the Secretary of State that, since the budget was originally set (or previously altered), there have been significant changes affecting the basis on which the previous decision was made.

(4) An order setting the carbon budget for a period may be amended after the period has begun only if it appears to the Secretary of State that there have been such changes since the period began.

(5) An order setting the carbon budget for a period may not be amended after 31st May in the second year following the end of the period.

(6) An order revoking or amending an order setting a carbon budget is subject to affirmative resolution procedure.

Interpretation

14 Carbon dioxide emissions and carbon removals

(1) In this Part—

(a) "carbon dioxide emissions" means emissions of carbon dioxide into the atmosphere that are attributable to human activity;

(b) "UK carbon dioxide emissions" means carbon dioxide emissions from sources in the United Kingdom;

(c) "UK carbon dioxide removals" means removals of carbon dioxide from the atmosphere due to land use, land-use change or forestry activities in the United Kingdom;

(d) the "net UK carbon dioxide emissions" for a period means the amount of UK carbon dioxide emissions for the period reduced by the amount for the period of UK carbon dioxide removals.

(2) The amount of UK carbon dioxide emissions and UK carbon dioxide removals for a period must be determined consistently with international carbon reporting practice.

15 Emissions from international aviation or shipping

(1) Carbon dioxide emissions from international aviation or shipping do not count as emissions from sources in the United Kingdom for the purposes of this Part, except as provided by regulations under this section.

(2) The Secretary of State may by order define what is to be regarded for this purpose as international aviation or shipping.
Any such order is subject to negative resolution procedure.

(3) If there is a change in international carbon reporting practice relating to aviation or shipping, the Secretary of State may make provision by regulations as to the circumstances in which, and the extent to which, carbon dioxide emissions from international aviation or shipping are to be regarded for the purposes of this Part as emissions from sources in the United Kingdom.

(4) The regulations may make provision—

(a) as to the period or periods (whether past or future) in which emissions are to be taken into account as UK carbon dioxide emissions, and

(b) as to the manner in which such emissions are to be taken into account in determining the 1990 baseline in relation to those periods.

(5) They may, in particular—

(a) designate a different base year, or

(b) designate a number of base years,

and provide for the emissions in that year, or the average amount of emissions in those years, to be taken into account as if part of the 1990 baseline.

(6) Regulations under this section are subject to affirmative resolution procedure.

16 Carbon credits and carbon debits

(1) In this Part—

"carbon credits" means amounts that in accordance with regulations made by the Secretary of State may be set against net UK carbon dioxide emissions for the purposes of this Part;

"carbon debits" means amounts that in accordance with regulations made by the Secretary of State are to be added to the amount of net UK carbon dioxide emissions for the purposes of this Part.

(2) The credits must be amounts representing—

(a) a reduction in an amount of greenhouse gas emissions,

(b) the removal of an amount of greenhouse gas from the atmosphere, or

(c) an amount of greenhouse gas emissions allowed under a scheme or arrangement imposing a limit on such emissions,

being emissions from sources, and removals occurring, outside the United Kingdom.

(3) The debits must be amounts representing—

(a) a reduction in an amount of greenhouse gas emissions,

(b) the removal of an amount of greenhouse gas from the atmosphere, or

(c) an amount of greenhouse gas emissions allowed under a scheme or arrangement imposing a limit on such emissions,

being emissions from sources, and removals occurring, in the United Kingdom.

(4) In relation to credits, the regulations must make provision as to—

(a) the credits that may be used,

(b) the amount of carbon dioxide emissions that different types of credit are treated as offsetting, and

(c) the circumstances in which a credit is to be set against net UK carbon dioxide emissions.

(5) In relation to debits, the regulations must make provision as to—

(a) the debits to be taken into account,

(b) the amount of carbon dioxide emissions to which different types of debit are treated as equivalent, and

(c) the circumstances in which a debit is to be added to the amount of net UK carbon dioxide emissions.

17 Carbon credits and carbon debits: supplementary

(1) The following provisions apply to regulations under section 16 (carbon credits and carbon debits).

(2) The regulations may make provision—

(a) for a scheme for registering or otherwise keeping account of carbon credits and carbon debits;

(b) appointing a body to administer the scheme;

(c) establishing a body for that purpose and making such provision in relation to the appointment of members, staffing, expenditure, procedure and otherwise as the Secretary of State considers appropriate;

(d) conferring power on the Secretary of State to give guidance or directions to the body administering the scheme;

(e) requiring the payment by persons using the scheme of fees (of an amount determined by or under the regulations) towards the cost of operating it.

(3) If an existing body is appointed to administer the scheme, the regulations may make such modifications of any enactment relating to that body as the Secretary of State considers appropriate.

(4) The regulations must contain provision for ensuring that credits that are set against net UK carbon dioxide emissions for the purposes of this Part cease to be available to offset other greenhouse gas emissions.

(5) Regulations making such provision as is mentioned in subsection (3) above are subject to affirmative resolution procedure.

(6) Other regulations under section 16 are subject to negative resolution procedure.

18 Net UK carbon account

In this Part the "net UK carbon account" for a period means the amount of net UK carbon dioxide emissions for the period—

(a) reduced by the amount of carbon credits used in accordance with regulations under section 16 to offset those emissions, and

(b) increased by the amount of carbon debits that in accordance with regulations under that section are to be added to those emissions.

PART 2

THE COMMITTEE ON CLIMATE CHANGE

The Committee

19 The Committee on Climate Change

(1) There shall be a body corporate to be known as the Committee on Climate Change (referred to in this Part as "the Committee").

(2) Schedule 1 contains further provisions about the Committee.

Functions of the Committee

20 Advice in connection with carbon budgets

(1) It is the duty of the Committee to advise the Secretary of State, in relation to each budgetary period, on—

(a) the level of the carbon budget for the period,

(b) the extent to which the carbon budget for the period should be met—

(i) by reducing the amount of net UK carbon dioxide emissions, or

(ii) by the use of carbon credits, and

(c) the respective contributions towards meeting the carbon budget for the period that should be made by—

(i) sectors of the economy covered by trading schemes, and

(ii) other sectors of the economy.

(2) In relation to the budgetary period 2008-2012, the Committee must also advise the Secretary of State on—

(a) whether it would be consistent with its advice on the level of the carbon budget for the period to set a carbon budget such that the annual equivalent for the period was lower than the 1990 baseline by 20%, and

(b) the costs and benefits of setting such a budget.

(3) The Committee must give its advice under this section—

(a) for the budgetary periods 2008-2012, 2013-2017 and 2018-2022, before 1st September 2008;

(b) for any later period, not later than four months before the last date for setting the carbon budget for the period (see section 2(2)(b)).

21 Reports on progress

(1) It is the duty of the Committee to lay before Parliament each year, beginning with the year 2009, a report setting out the Committee's views on the progress made towards meeting—

(a) the carbon budgets set under Part 1, and

(b) the target in section 1 (the target for 2050).

(2) The Committee's report in the second year after the end of a budgetary period must also—

(a) state the final figures for the period for—

(i) UK carbon dioxide emissions, UK carbon dioxide removals and net UK carbon dioxide emissions,

(ii) the amount of carbon credits used towards meeting the carbon budget (giving details of the number and type of those carbon credits),

(iii) the amount of carbon debits falling to be taken into account, and

(iv) the net UK carbon account; and

(b) set out the Committee's views on the manner in which the Secretary of State's functions under Part 1 were performed in relation to the period.

(3) A report under this section must be laid before Parliament not later than 30th June in the year in which it is made.

(4) The Secretary of State may by order extend that period.

(5) Any such order is subject to negative resolution procedure.

22 Duty to provide advice or other assistance on request

(1) It is the duty of the Committee, if at any time requested to do so by the Secretary of State, to provide advice, analysis, information or other assistance to the Secretary of State in connection with—

(a) the Secretary of State's functions under this Act,

(b) the progress made towards meeting the objectives set by or under this Act, or

(c) climate change generally.

(2) In particular, the Committee must, if at any time requested to do so by the Secretary of State—

(a) advise the Secretary of State about any limit proposed to be set by a trading scheme on the total amount of the activities to which the scheme applies;
(b) assist the Secretary of State in connection with the preparation of statistics relating to greenhouse gas emissions;
(c) advise the Secretary of State about whether to bring forward legislation providing for targets and budgets for emissions of greenhouse gases other than carbon dioxide;
(d) advise the Secretary of State about the level of any such targets and budgets.

Supplementary provisions

23 General ancillary powers

(1) The Committee may do anything that appears to it necessary or appropriate for the purpose of, or in connection with, the carrying out of its functions.

(2) In particular the Committee may—
(a) carry out or commission research,
(b) enter into contracts,
(c) acquire, hold and dispose of property,
(d) borrow money,
(e) accept gifts, and
(f) invest money.

24 Grants to the Committee

(1) The Secretary of State may make grants to the Committee of such amounts as the Secretary of State thinks fit.

(2) A grant may be made subject to such conditions as the Secretary of State thinks fit.

25 Power of Secretary of State to give guidance

(1) The Secretary of State may give the Committee guidance as to matters to be taken into account by it in the exercise of any of its functions.

(2) The guidance may relate to a particular function or functions or to the Committee's functions generally.

(3) The power to give guidance under this section includes power to vary or revoke it.

(4) In performing its functions the Committee must have regard to any guidance given under this section.

26 Power of Secretary of State to give directions

(1) The Secretary of State may give the Committee general or specific directions as to the exercise of its functions.

(2) The power to give directions under this section does not include power to direct the Committee as to the content of any advice or report.

(3) The power to give directions under this section includes power to vary or revoke the directions.

(4) The Committee must comply with any directions given under this section.

Interpretation

27 Interpretation of Part 2

Expressions used in this Part that are defined in Part 1 (carbon target and budgeting) have the same meaning as in that Part.

PART 3

TRADING SCHEMES

Trading schemes

28 Trading schemes

(1) The Secretary of State may make provision by regulations for trading schemes relating to greenhouse gas emissions.

(2) A trading scheme may be framed with a view to—

(a) limiting activities that consist of the emission of greenhouse gas or that cause or contribute, directly or indirectly, to such emissions, or

(b) encouraging activities that cause or contribute, directly or indirectly, to the reduction of greenhouse gas emissions or the removal of greenhouse gas from the atmosphere.

29 Activities to which trading schemes may apply

(1) For the purposes of this Part activities are regarded as indirectly causing or contributing to greenhouse gas emissions if they involve, in particular—

(a) the consumption of energy whose production directly caused or contributed to greenhouse gas emissions,

(b) the use of materials in whose production such energy was consumed,

(c) the disposal otherwise than for recycling of materials in whose production energy was consumed, or

(d) the production or supply of anything whose subsequent use directly causes or contributes to greenhouse gas emissions.

(2) Correspondingly, for the purposes of this Part activities are regarded as indirectly causing or contributing to the reduction of greenhouse gas emissions if they involve a reduction under any of those heads.

(3) This Part applies to activities carried on in the United Kingdom, regardless of where the related emissions, reductions or removals of greenhouse gas occur.

30 Matters that may or must be provided for in regulations

(1) Schedule 2 specifies matters that may or must be provided for in regulations under this Part.

(2) In that Schedule—

Part 1 deals with schemes framed with a view to limiting activities that consist of the emission of greenhouse gas or that cause or contribute to such emissions;

Part 2 deals with schemes framed with a view to encouraging activities that cause or contribute to reductions of greenhouse gas emissions or to removals of greenhouse gas from the atmosphere;

Part 3 deals with administration and enforcement.

(3) Regulations under this Part may also make provision about the application of the regulations to the Crown.

31 Procedure for making regulations

(1) Before making regulations under this Part the Secretary of State must consult such persons likely to be affected by the regulations as the Secretary of State considers appropriate.

(2) Before making regulations under this Part that set a limit on the total amount of the activities to which a trading scheme applies for a trading period or periods, the Secretary of State must obtain, and take into account, the advice of the Committee on Climate Change on the amount of the limit.

(3) Regulations under this Part are subject to affirmative resolution procedure if they—

(a) create a trading scheme,
(b) extend the class of participants or activities to which a trading scheme applies,
(c) extend the duration of a trading scheme,
(d) make the overall requirements of a trading scheme significantly more onerous,
(e) create an offence or increase the penalties for an existing offence, or
(f) amend or repeal a provision of an Act of Parliament.

(4) Otherwise, regulations under this Part are subject to negative resolution procedure.

Supplementary provisions

32 Power of Secretary of State to give guidance

(1) The Secretary of State may give the administrator of a trading scheme guidance as to the exercise of the administrator's functions.

(2) The guidance may relate to a particular function or functions or to the administrator's functions generally.

(3) The power to give guidance under this section includes power to vary or revoke it.

(4) In performing its functions the administrator must have regard to any guidance given under this section.

33 Power of Secretary of State to give directions

(1) The Secretary of State may give the administrator of a trading scheme general or specific directions as to the exercise of the administrator's functions.

(2) The power to give directions under this section includes power to vary or revoke the directions.

(3) The administrator must comply with any directions given under this section.

34 Grants to participants

(1) The Secretary of State may make, or arrange for the making of, grants to the participants in a trading scheme.

(2) A grant under this section may be made subject to such conditions as may be determined by, or in accordance with arrangements made by, the Secretary of State.

Interpretation etc

35 Interpretation of Part 3

In this Part—

"administrator", in relation to a trading scheme, means a person appointed as the administrator of the scheme by regulations under paragraph 18 of Schedule 2;

"participants", in relation to a trading scheme, means the persons to whom the scheme applies by virtue of regulations under paragraph 4 or 13 of Schedule 2;

"trading period", in relation to a trading scheme, means a period by reference to which the scheme is to operate by virtue of regulations under paragraph 2 or 11 of Schedule 2.

36 Power to make consequential and transitional provision

The Secretary of State may by regulations—

(a) make such provision amending, repealing or revoking any enactment as the Secretary of State considers appropriate in consequence of regulations under this Part;

(b) make such transitional provision and savings as the Secretary of State considers appropriate in connection with the coming into effect of such regulations.

PART 4

MISCELLANEOUS AND SUPPLEMENTARY PROVISIONS

Miscellaneous

37 General duty to report on adaptation to climate change

(1) It is the duty of the Secretary of State to lay before Parliament from time to time a report—

(a) containing an assessment of the risks of the current and predicted impacts of climate change for the United Kingdom, and

(b) setting out the proposals and policies of Her Majesty's Government in the United Kingdom for adapting to climate change.

(2) Subject to subsection (3)—

(a) the first report under this section must be laid before Parliament no later than three years after this Act comes into force, and

(b) subsequent reports must be laid before Parliament no later than five years after the previous report was so laid.

(3) The Secretary of State may extend the period for laying any such report, but must publish a statement setting out the reasons for the delay and specifying when the report will be laid before Parliament.

Supplementary provisions

38 International carbon reporting practice

(1) In this Act "international carbon reporting practice" means accepted practice in relation to reporting for the purposes of the protocols to the United Nations Framework Convention on Climate Change or such other international agreements or arrangements as the Secretary of State may specify by order.

(2) An order under this section is subject to negative resolution procedure.

39 Territorial scope of application

(1) This Act applies to emissions from sources or other matters occurring in, above or below—

(a) UK coastal waters, or

(b) the UK sector of the continental shelf,

as it applies to emissions from sources or matters occurring in the United Kingdom.

(2) In subsection (1)—

"UK coastal waters" means areas landward of the seaward limit of the territorial sea adjacent to the United Kingdom;

"the UK sector of the continental shelf" means the areas designated under section 1(7) of the Continental Shelf Act 1964 (c. 29).

(3) This section is subject to section 15 (emissions from international aviation or shipping not to count as emissions from UK sources for the purposes of Part 1, except as provided by regulations).

40 Financial provisions

(1) There shall be paid out of money provided by Parliament—
  (a) any expenses incurred by the Secretary of State—
    (i) in acquiring carbon credits to be set against net UK carbon emissions for the purposes of Part 1, or
    (ii) in making grants under section 24 (grants to Committee on Climate Change) or section 34 (grants to participants in trading schemes;
  (b) any other expenses incurred by a government department in consequence of this Act.

(2) Sums received by virtue of this Act by way of fees—
  (a) if received by the Secretary of State, must be paid into the Consolidated Fund, and
  (b) if received by a person other than the Secretary of State, must be paid by that person to the Secretary of State, who must pay them into the Consolidated Fund.

41 Orders and regulations

(1) Orders and regulations under this Act shall be made by statutory instrument.

(2) Where orders or regulations under this Act are subject to "affirmative resolution procedure" the order or regulations must not be made unless a draft of the statutory instrument containing them has been laid before and approved by a resolution of each House of Parliament.

(3) Where orders or regulations under this Act are subject to "negative resolution procedure" the statutory instrument containing the order or regulations is subject to annulment in pursuance of a resolution of either House of Parliament.

(4) An order or regulations under this Act may—
  (a) make different provision for different cases or circumstances,
  (b) include supplementary, incidental and consequential provision, and
  (c) make transitional provision and savings.

(5) Any provision that may be made by order under this Act may be made by regulations; and any provision that may be made by regulations under this Act may be made by order.

(6) Any provision that may be made by order or regulations under this Act subject to negative resolution procedure may be made by order or regulations subject to affirmative resolution procedure.

42 General interpretation

(1) In this Act—
  "the 1990 baseline" has the meaning given by section 1(2);
  "annual equivalent", in relation to the carbon budget for a period, has the meaning given by section 3(2);
  "enactment" includes—
    (a) an enactment contained in subordinate legislation within the meaning of the Interpretation Act 1978 (c. 30),

(b) an enactment contained in, or in an instrument made under, an Act of the Scottish Parliament,

(c) an enactment contained in, or in an instrument made under, Northern Ireland legislation within the meaning of the Interpretation Act 1978 (c. 30), and

(d) an enactment contained in, or in an instrument made under, a Measure or Act of the National Assembly for Wales;

"fuel poverty" shall be construed in accordance with the provisions of section 1 of the Warm Homes and Energy Conservation Act 2000 (c. 31);

"greenhouse gas" means any of the following—

(a) carbon dioxide (CO_2),

(b) methane (CH_4),

(c) nitrous oxide (N_2O),

(d) hydrofluorocarbons (HFCs),

(e) perfluorocarbons (PFCs),

(f) sulphur hexafluoride (SF_6);

"greenhouse gas emissions" means emissions of greenhouse gases that are attributable to human activity;

"international carbon reporting practice" has the meaning given by section 38.

(2) For the purposes of this Act greenhouse gas emissions, reductions of such emissions and removals of greenhouse gas from the atmosphere shall be measured or calculated in tonnes of carbon dioxide equivalent.

(3) A "tonne of carbon dioxide equivalent" means one metric tonne of carbon dioxide or an amount of any other greenhouse gas with an equivalent global warming potential (calculated consistently with international carbon reporting practice).

Final provisions

43 Extent

This Act extends to the whole of the United Kingdom.

44 Commencement

This Act comes into force at the end of two months beginning with the day it is passed.

45 Short title

The short title of this Act is the Climate Change Act 2007.

SCHEDULES

SCHEDULE 1

Section 19

THE COMMITTEE ON CLIMATE CHANGE

Membership

1 (1) The Committee shall consist of—
(a) a person appointed by the Secretary of State to chair the Committee ("the chair"), and
(b) not less than five and not more than eight other members appointed by the Secretary of State.

(2) The Secretary of State must consult the chair before appointing the other members.

(3) In appointing a member, the Secretary of State must have regard to the desirability of securing that the Committee (taken as a whole) has experience in or knowledge of—
(a) economic analysis and forecasting,
(b) business competitiveness,
(c) financial investment,
(d) technology development and diffusion,
(e) energy production and supply,
(f) climate science,
(g) emissions trading, and
(h) climate change policy, and in particular the social impacts of such policy.

(4) The Secretary of State may by order amend sub-paragraph (1)(b) so as to alter the minimum or maximum number of members of the Committee.

(5) Any such order is subject to negative resolution procedure.

2 The Secretary of State may appoint one of the members as deputy to the chair ("the deputy chair").

Term of office

3 A member holds and vacates office in accordance with the terms of the member's appointment.

4 A member may resign by giving written notice to the Secretary of State.

5 The Secretary of State may remove a member—
(a) who has been absent from meetings of the Committee without its permission for a period of 6 months or more,

(b) who has become bankrupt or has made an arrangement with creditors,

(c) whose estate has been sequestrated in Scotland or who, under Scots law, has made a composition or arrangement with, or granted a trust deed for, creditors, or

(d) who in the opinion of the Secretary of State is otherwise unable or unfit to carry out the duties of that member.

6 A person ceases to be the chair or the deputy chair if the person—

(a) resigns that office by giving written notice to the Secretary of State, or

(b) ceases to be a member.

7 A person who—

(a) ceases to be a member, or

(b) ceases to be the chair or the deputy chair,

may be reappointed to that office.

Remuneration and pensions etc

8 The Committee may pay to the members such remuneration and allowances as the Secretary of State may determine.

9 The Committee must, if required to do so by the Secretary of State—

(a) pay such pensions, gratuities or allowances as the Secretary of State may determine to or in respect of any person who is or has been a member, or

(b) pay such sums as the Secretary of State may determine towards provision for the payment of pensions, gratuities or allowances to or in respect of such a person.

10 (1) This paragraph applies if a person who, by reference to any office or employment, is a participant in a scheme under section 1 of the Superannuation Act 1972 (c. 11) becomes a member.

(2) The Minister for the Civil Service may determine that the person's service as member is to be treated for the purposes of the scheme as service in that office or employment (whether or not any benefits are payable by virtue of paragraph 9).

(3) The Committee must pay to the Minister for the Civil Service, at such times as the Minister may direct, such sums as the Minister may determine in respect of any increase attributable to this paragraph in the sums payable out of money provided by Parliament under the Superannuation Act 1972.

11 If the Secretary of State thinks there are special circumstances which make it right for a person who has ceased to be a member to receive compensation, the Committee must pay the person such compensation as the Secretary of State may determine.

Staff

12 (1) The Committee must appoint a person to be chief executive, but may only appoint a person who has been approved by the Secretary of State.

(2) The chief executive is an employee of the Committee.

(3) The Secretary of State may appoint the first chief executive.

13 The Committee may appoint other employees.

14 The Committee must, if required to do so by the Secretary of State—

(a) pay such pensions, gratuities or allowances as the Secretary of State may determine to or in respect of any employee or former employee, or

(b) pay such sums as the Secretary of State may determine towards provision for the payment of pensions, gratuities or allowances to or in respect of any employee or former employee.

15 (1) In Schedule 1 to the Superannuation Act 1972 (c. 11) (kinds of employment to which section 1 of that Act applies) in the list of other bodies at the appropriate place insert—

"The Committee on Climate Change."

(2) The Committee must pay to the Minister for the Civil Service, at such times as the Minister may direct, such sums as the Minister may determine in respect of any increase attributable to sub-paragraph (1) in the sums payable out of money provided by Parliament under the Superannuation Act 1972.

Sub-committees

16 (1) The Committee may establish sub-committees.

(2) A sub-committee may include persons who are not members of the Committee.

(3) The Committee may pay such remuneration and allowances as the Secretary of State may determine to any person who—

(a) is a member of a sub-committee, but

(b) is not a member of the Committee.

Proceedings

17 The Committee may regulate—

(a) its own procedure (including quorum), and

(b) the procedure of any sub-committee (including quorum).

18 The validity of anything done by the Committee or any sub-committee is not affected by—

(a) any vacancy in the membership of the Committee or sub-committee, or

(b) any defect in the appointment of any member of the Committee or sub-committee.

Discharge of functions

19 The Committee may authorise a sub-committee, member or employee to exercise any of the Committee's functions.

Application of seal and proof of documents

20 (1) The application of the Committee's seal must be authenticated by the signature of—

(a) a member of the Committee who is authorised (generally or specially) for that purpose, or

(b) an employee who is so authorised.

(2) A document purporting to be duly executed under the seal of the Committee or to be signed on behalf of the Committee shall be received in evidence and treated as so executed or signed unless the contrary is shown.

(3) This paragraph does not apply in relation to Scotland.

Reports, accounts etc

21 For each financial year the Committee must—

(a) prepare an annual report on the discharge of its functions during the year, and

(b) send a copy to the Secretary of State within such period as the Secretary of State directs.

22 In this Schedule "financial year" means—

(a) the period beginning with the day the Committee is established and ending with the next 31st March, and

(b) each subsequent period of 12 months ending with 31st March.

23 (1) The Committee must keep proper accounts and proper records in relation to the accounts.

(2) For each financial year the Committee must—

(a) prepare a statement of accounts in respect of that financial year, and

(b) send copies of the statement to the Secretary of State and the Comptroller and Auditor General within such period as the Secretary of State directs.

(3) The statement must be in such form as the Secretary of State may direct.

(4) The Comptroller and Auditor General must—

(a) examine, certify and report on the statement, and

(b) send a copy of the certified statement and the report to the Secretary of State as soon as possible.

24 The Secretary of State must lay before each House of Parliament a document consisting of—

(a) a copy of the report sent under paragraph 21, and

(b) a copy of the statement sent under paragraph 23(4).

25 (1) The Committee must provide the Secretary of State with such information as the Secretary of State may require relating to its property or to the discharge or proposed discharge of its functions.

(2) The Committee must also—

(a) permit any person authorised by the Secretary of State to inspect and make copies of any accounts or other documents of the Committee, and

(b) provide such explanation of them as that person or the Secretary of State may require.

Status

26 The Committee is not to be regarded as the servant or agent of the Crown or as enjoying any status, privilege or immunity of the Crown.

Public Records Act 1958 (c. 51)

27 In Schedule 1 to the Public Records Act 1958 (definition of public records) in Part 2 of the Table at the end of paragraph 3 at the appropriate place insert—

"The Committee on Climate Change."

Parliamentary Commissioner Act 1967 (c. 13)

28 In Schedule 2 to the Parliamentary Commissioner Act 1967 (departments etc subject to investigation) at the appropriate place insert—

"The Committee on Climate Change."

House of Commons Disqualification Act 1975 (c. 24)

29 In Part 2 of Schedule 1 to the House of Commons Disqualification Act 1975 (bodies of which all members are disqualified) at the appropriate place insert—

"The Committee on Climate Change."

Northern Ireland Assembly Disqualification Act 1975 (c. 25)

30 In Part 2 of Schedule 1 to the Northern Ireland Assembly Disqualification Act 1975 (bodies of which all members are disqualified) at the appropriate place insert—

"The Committee on Climate Change."

Race Relations Act 1976 (c. 74)

31 In Part 2 of Schedule 1A to the Race Relations Act 1976 (bodies and other persons subject to general statutory duty) at the appropriate place insert—

"The Committee on Climate Change."

Freedom of Information Act 2000 (c. 36)

32 In Part 6 of Schedule 1 to the Freedom of Information Act 2000 (other public bodies and offices which are public authorities) at the appropriate place insert—

"The Committee on Climate Change."

SCHEDULE 2

Section 30

TRADING SCHEMES

PART 1

SCHEMES LIMITING ACTIVITIES

Introductory

1 This Part deals with trading schemes framed with a view to limiting activities that consist of the emission of greenhouse gas or that cause or contribute, directly or indirectly, to such emissions.

Trading periods

2 The regulations must specify the period or periods by reference to which the scheme is to operate (a "trading period").

Activities

3 (1) The regulations must identify the activities to which the trading scheme applies.

(2) The regulations may, in particular—

(a) identify the activities by reference to the locations or locations at which they are carried on, or

(b) be expressed to apply to all activities of a particular kind carried on in the United Kingdom or a part of the United Kingdom.

(3) The regulations must specify the units of measurement of the activities for the purposes of the scheme.

(4) The regulations may specify units of measurement by reference to—

(a) the activities themselves,

(b) anything consumed or used for the purposes of the activities,

(c) anything produced by the activities, or

(d) any other consequence of the activities.

(5) The regulations may, in particular, make provision—

(a) for activities to be measured by reference to the amount (in tonnes of carbon dioxide equivalent) of the greenhouse gas emissions for which those activities are to be regarded as responsible; and

(b) as to the method by which that amount is to be measured or calculated.

(6) The regulations may make different provision in relation to different descriptions of activity to which the scheme applies.

Participants

4 (1) The regulations must identify the persons to whom the trading scheme applies (the "participants").

(2) The regulations—

(a) may identify the participants by reference to any, or any combination of, criteria, or

(b) provide for their identification by a specified person or body.

(3) The regulations may, in particular, identify or provide for the identification of the participants by reference to their responsibility for activities to which the trading scheme applies.

(4) The regulations may provide for more than one person to be treated as a single participant.

(5) The regulations may provide for persons to cease to be participants in circumstances specified in the regulations.

Allowances

5 (1) The regulations may provide for the allocation among the participants of allowances representing the right to carry on a specified amount of the activities in a trading period.

(2) The regulations may set a limit on—

(a) the total amount of the activities for a trading period, and

(b) the total amount of the allowances to be allocated for the period.

(3) The regulations—

(a) must provide for the allowances to be allocated free of charge, and

(b) may specify the method of allocation or provide for it to be determined in accordance with the regulations.

Paragraph (a) does not affect the power to require the payment of a fee: see paragraph 21.

(4) The regulations may require each participant to have or acquire enough allowances to match the participant's activities in a trading period, subject to any offsetting.

(5) The regulations—

(a) must contain provision for ensuring that allowances used by a participant for that purpose cannot be used by the participant for any other purpose;

(b) may enable allowances to be cancelled by a person by whom they are held instead of being used for that purpose.

Credits

6 (1) The regulations may enable participants to offset the carrying on of the activities in a trading period by acquiring credits representing—

(a) a reduction in an amount of greenhouse gas emissions, or

(b) the removal of an amount of greenhouse gas from the atmosphere.

(2) Regulations that make provision under this paragraph for a trading period must set a limit on the total amount of the activities for the period.

(3) If the regulations also provide for the allocation of allowances for the period, they must—

(a) set a limit on the total amount of the allowances to be allocated for the period, and

(b) require each participant to acquire enough credits to offset any activities carried on by the participant in the period in excess of those for which the participant has or has acquired allowances.

(4) Otherwise, such regulations must—

(a) set a limit on the amount of the activities that each participant may carry on in the period, and

(b) require each participant to acquire enough credits to offset any activities carried on by the participant in the period in excess of that limit.

(5) The regulations must specify—

(a) the descriptions of credits that may be used for offsetting a participant's activities,

(b) the value of different descriptions of credit as regards the amount of the activities they are treated as offsetting, and

(c) the circumstances in which credits of any description may be used for the purposes of the trading scheme.

(6) The regulations—

(a) must contain provision for ensuring that credits used to offset activities under a trading scheme cannot be used by the participant for any other purpose;

(b) may enable credits to be cancelled by a person by whom they are held instead of being used for that purpose.

Trading

7 (1) The regulations must provide for the participants in a trading scheme to trade in any allowances or credits under the scheme.

(2) The regulations may also provide for trading in the allowances or credits by third parties authorised in accordance with the regulations.

(3) The regulations must specify the circumstances in which trading is permitted.

(4) The regulations may require trading to be notified to the administrator of the trading scheme.

Permits

8 (1) The regulations may provide that participants may only carry on activities to which the trading scheme applies, or specified activities to which the scheme applies, if they hold a permit.

(2) The regulations may make provision about the issue, variation, transfer, surrender and revocation of permits.

(3) The regulations may provide for conditions to be attached to permits.

(4) References in this Schedule to the requirements of the scheme include requirements imposed by conditions attached to a permit.

Units under other schemes

9 (1) The regulations may make provision for recognising any of the following as equivalent to allowances or credits under the trading scheme—

(a) allowances, credits or certificates under another trading scheme for which provision is made by regulations under this Part;

(b) units under any other trading scheme (at United Kingdom, European or international level) relating to greenhouse gas emissions.

(2) The regulations may provide for determining the value for the purposes of the scheme of any such allowances, credits, certificates or units.

PART 2

SCHEMES ENCOURAGING ACTIVITIES

Introductory

10 This Part deals with trading schemes framed with a view to encouraging activities that consist of, or that cause or contribute, directly or indirectly to—

(a) reductions in greenhouse gas emissions, or

(b) the removal of greenhouse gas from the atmosphere.

Trading periods

11 The regulations must specify the period or periods by reference to which the scheme is to operate (a "trading period").

Activities

12 (1) The regulations must—

(a) identify the activities to which the trading scheme applies, and

(b) specify the units of measurement of the activities for the purposes of the scheme.

(2) The regulations may specify units of measurement by reference to—

(a) the activities themselves,

(b) anything consumed or used for the purposes of the activities,

(c) anything produced by the activities, or

(d) any other consequence of the activities.

(3) The regulations may, in particular, make provision—

(a) for activities to be measured by reference to the amount (in tonnes of carbon dioxide equivalent) of the reduction of greenhouse gas emissions, or removals of greenhouse gas from the atmosphere, for which those activities are to be regarded as responsible; and

(b) as to the method by which that amount is to be measured or calculated.

(4) The regulations may make different provision in relation to different descriptions of activity to which the scheme applies.

Participants

13 (1) The regulations must identify the persons to whom the trading scheme applies (the "participants").

(2) The regulations—

(a) may identify the participants by reference to any, or any combination of, criteria, or

(b) provide for their identification by a specified person or body.

(3) The regulations may provide for more than one person to be treated as a single participant.

(4) The regulations may provide for persons to cease to be participants in circumstances specified in the regulations.

Targets and obligations

14 The regulations must, for each trading period—

(a) set a target for the total amount of the activities, and

(b) impose, or provide for the imposition of, an obligation on each participant in relation to the carrying on of a specified amount of the activities in the period.

Certificates

15 (1) The regulations must provide for the issue of certificates evidencing the carrying on of the activities in a trading period.

(2) The regulations may provide for certificates to evidence the carrying on of the activities—

(a) by the participant in question,

(b) by another participant in the trading scheme, or

(c) by a third party authorised in accordance with the regulations to obtain certificates for the purposes of the scheme.

(3) The regulations must require each participant to have enough certificates at the end of each trading period to comply with the participant's obligations under the trading scheme.

(4) The regulations—

(a) must contain provision for ensuring that certificates used by a participant for that purpose cannot be used by the participant for any other purpose;

(b) may enable certificates to be cancelled by a person by whom they are held instead of being used for that purpose.

Trading

16 (1) The regulations must provide for the participants in a trading scheme to trade in certificates.

(2) The regulations may also provide for trading in certificates by third parties authorised in accordance with the regulations.

(3) The regulations must specify the circumstances in which trading is permitted.

(4) The regulations may require trading to be notified to the administrator of the trading scheme.

Units under other schemes

17 (1) The regulations may make provision for recognising any of the following as equivalent to certificates under the trading scheme—

(a) allowances, credits or certificates under another trading scheme for which provision is made by regulations under this Part;

(b) units under any other trading scheme (at United Kingdom, European or international level) relating to greenhouse gas emissions.

(2) The regulations may provide for determining the value for the purposes of the scheme of any such allowances, credits, certificates or units.

PART 3

ADMINISTRATION AND ENFORCEMENT

The administrator

18 (1) The regulations may appoint a person as the administrator of a trading scheme.

(2) The regulations may confer or impose functions on the administrator for the purposes of the scheme.

(3) Only the following may be appointed as the administrator of a trading scheme—

(a) the Secretary of State,

(b) a body established by an enactment, or

(c) a combination of two or more such bodies.

(4) The same person may be appointed as the administrator of more than one trading scheme.

(5) More than one person may be appointed as the administrator of the same trading scheme.

Monitoring compliance

19 (1) The regulations may make provision for monitoring compliance with the requirements of a trading scheme.

(2) The regulations may, in particular, make provision about—

(a) the keeping of records by the participants,

(b) the supply of information by the participants and other persons,

(c) the audit and verification of that information, and

(d) the inspection of premises.

(3) If the regulations confer functions on the administrator of the scheme for the purposes of this paragraph, they may provide for the administrator to delegate the performance of any of those functions.

Registers

20 (1) The regulations may provide for the creation of a register or registers of information relating to a trading scheme.

(2) The regulations may, in particular, provide for a register relating to a trading scheme to hold information about any of the following matters—

(a) the participants in the scheme;
(b) any limits on or obligations applying to the participants' activities under the scheme;
(c) any allocation of allowances among the participants;
(d) trading in allowances, credits or certificates;
(e) the allowances, credits or certificates held by the participants;
(f) permits held by the participants, and any conditions attached to those permits.

(3) The regulations may provide for the same register to hold information relating to more than one trading scheme.

(4) The regulations may make provision for the disclosure of information held in a register relating to a trading scheme—

(a) for the purposes of the administration of another trading scheme for which provision is made by regulations under this Part, or
(b) for the purposes of the administration of any other trading scheme (at United Kingdom, European or international level) relating to greenhouse gas emissions.

Fees

21 The regulations may—

(a) require the payment by participants of fees (of an amount determined by or under the regulations) towards the cost of operating the scheme, or
(b) provide for such fees to be imposed by—
(i) the Secretary of State,
(ii) the administrator of the scheme, or
(iii) such other person as may be specified in or determined in accordance with the regulations.

Enforcement

22 (1) The regulations may confer powers on the Secretary of State, the administrator of a trading scheme or such other person as may be specified in or determined in accordance with the regulations to—

(a) require the production of documents or the provision of information,
(b) question the officers of a company,
(c) enter premises with a warrant, or
(d) seize documents or records.

(2) The regulations must provide that the power in question may only be exercised where the person on whom it is conferred reasonably believes there has been a failure to comply with the requirements of a trading scheme.

Penalties

23 (1) The regulations may provide that a person is liable to a financial or other penalty if the person fails to comply with the requirements of a trading scheme.

(2) The regulations may—

(a) specify the amount of any financial penalty, or

(b) provide for the amount of any financial penalty to be determined in accordance with the regulations.

(3) The regulations may provide for enforcement action to be taken against a person who fails to comply with the requirements of a trading scheme.

Offences

24 (1) The regulations may—

(a) create offences relating to trading schemes,

(b) specify the penalties for such offences,

(c) provide for defences against such offences, and

(d) make provision about matters of procedure and evidence in proceedings relating to such offences.

(2) The regulations may provide for enforcement action to be taken against a person who is convicted of an offence relating to a trading scheme.

Appeals

25 (1) The regulations may confer rights of appeal against—

(a) decisions made in relation to a trading scheme, and

(b) civil penalties imposed or enforcement action taken for failure to comply with the requirements of a trading scheme.

(2) The regulations must specify the court, tribunal or person who is to hear and determine appeals in relation to a trading scheme.

(3) The regulations may provide for appeals in relation to a trading scheme to be heard and determined by—

(a) the Secretary of State, if not the administrator of the trading scheme, or

(b) a person appointed by the Secretary of State for that purpose.

CLIMATE CHANGE BILL

EXPLANATORY NOTES

INTRODUCTION

1. These explanatory notes relate to the Climate Change Bill which was published in draft on 13 March 2007. They have been prepared by the Office of Climate Change ("OCC") in order to assist the reader in understanding the Bill. They do not form part of the Bill.

2. The notes need to be read in conjunction with the Bill. They are not, and are not meant to be, a comprehensive description of the contents of the Bill. So where a clause or part of a clause does not seem to require any explanation or comment, none is given.

3. They are not published by authority and users should verify for themselves whether any provision contained in them is in force or whether it has been amended or repealed by subsequent legislation.

SUMMARY

4. This draft Bill sets up a framework for the UK to achieve its long term goals of reducing carbon dioxide emissions and ensure steps are taken towards adapting to the impacts of climate change. It is made up of four elements:

- **Emission reduction targets in statute and carbon budgeting.** It is intended that the Bill will establish an economically credible emissions reduction pathway to 2050, by putting into statute medium and long-term targets. These targets already exist on a non-statutory basis. In addition, a system of carbon budgeting is proposed which constrains the total amount of emissions in a given time period. The Bill proposes that carbon budget periods should last five years, and be set three periods ahead. This approach is more flexible than annual targets would be, but it should be noted that the emissions in each and every year count towards the budget.

- **A climate change advisory body.** The Bill proposes to create a new institutional framework with which to manage the UK's carbon budgets, through establishing a new independent body, "the Committee on Climate Change", to advise Government on how to reduce emissions over time and across the economy. This expert body will advise on the

optimum trajectory to 2050, the level of carbon budgets and where cost-effective abatement options lie across the economy, as well as reporting on progress.

- **Enabling powers to address climate change.** The Bill includes new powers to enable Government to introduce new domestic emissions trading schemes through secondary legislation. This increases the policy options which Government could use to reduce emissions and meet the medium and long-term targets in the Bill.

- **A new reporting framework.** The Bill will provide for a system of reporting on the UK's carbon dioxide emissions by the Government and the Committee on Climate Change. The Committee will have a specific annual role in reporting publicly on progress, with the Government required to lay before Parliament a response to this progress report. The Bill also sets out a new reporting procedure for assessing the risks of the impacts of climate change on the UK.

BACKGROUND

5. The science of climate change is indisputable - climate change is an issue of critical importance and urgent action is needed both at home and internationally to tackle it.

6. Last year's Stern Review sets out the economic case for action on climate change, and concludes that the cost of inaction will be far higher than tackling climate change now. It also makes clear that the costs are lowest in the context of multilateral action.

7. While government has already set out significant steps to strengthen the domestic programme on climate change – most recently by publishing the UK Climate Change Programme and Energy Review, it is clear that that the urgency of the need to tackle climate change needs further concerted action. In October 2006 the Government announced its intention to publish legislation on Climate Change; this draft Bill realises that commitment.

THE BILL

Part 1: Carbon Target and Budgeting

8. This Part of the Bill gives the Secretary of State a duty to reduce the net UK carbon account for the year 2050 to 60% below the level of net carbon dioxide emissions in 1990. The term "net UK carbon account" is defined in clause 18.

9. It also requires the Secretary of State to set "carbon budgets" representing UK emissions for five year periods, minus emissions reductions outside the UK for which the UK has paid (measured by a system of carbon credits), plus emissions reductions in the UK which

have been sold abroad (measured by a system of carbon debits) beginning with the period 2008-2012. Part 1 of the Bill includes a duty on the Secretary of State to report UK emissions levels to Parliament, and to report on the measures the Government will take to meet the objectives in Part 1.

10. Part 1 makes further provision relating to the target and to budgets, including provision on how to calculate whether the target for 2050 has been met and how carbon budgets are to be set. It requires that the carbon budget for 2018-22 is set in a way that is consistent with the Government's target to reduce carbon dioxide emissions by between 26% and 32% by 2020. It makes provision on the amendment of certain aspects of Part 1 of the Bill in certain circumstances, and gives a duty to make regulations about how carbon credits and carbon debits are to be used to ensure that the net carbon account is within budget.

Part 2: The Committee on Climate Change

11. Part 2 and Schedule 1 establish a new independent non-departmental public body, the Committee on Climate Change ("the Committee").

12. Part 2 gives the Committee duties to advise the Secretary of State on the levels of carbon budgets, and on the apportionment of effort between reductions in domestic emissions levels and the use of carbon credits. The Committee must also advise on the amount of effort to be made by sectors of the economy in trading schemes, and other sectors of the economy.

13. The Committee is also given a function of making an annual report to Parliament on the progress that is being made towards meeting the objectives in Part 1 of the Bill. At the end of each budget period, the Committee must include in its annual report its views on how the Secretary of State exercised his functions under Part 1 of the Bill in relation to that budget period.

14. Part 2 also gives the Committee the powers it needs to deliver its advisory and reporting functions, and the Secretary of State is given powers to make grants to the Committee and to issue guidance and directions to the Committee. Schedule 1 sets out the Committee's constitution.

Part 3: Trading Schemes

15. Part 3 provides the Secretary of State with a power to set up trading schemes relating to greenhouse gas emissions though secondary legislation. Trading schemes may limit activities that directly or indirectly lead to emissions of greenhouse gases (for example, cap emissions from a particular set of activities and allow trading of emissions within the cap), or

they may encourage activities that directly or indirectly lead to a reduction in greenhouse gas emissions or the removal of greenhouse gases from the atmosphere.

Part 4: Miscellaneous and supplementary provisions

16. Part 4 makes supplementary provision, and includes a duty on the Secretary of State to report to Parliament at least every five years on the risks of the impacts of climate change and the Government's proposals and policies for adapting to climate change.

TERRITORIAL EXTENT

17. The Bill extends to the whole of the UK. For the purposes of pre-legislative scrutiny and consultation the Bill has been drafted with all powers and duties appearing to rest with the Secretary of State. This approach, which does not reflect the devolution settlements, has been taken – with the agreement of each of the devolved administrations – to enable consultation and debate to proceed on this matter while recognising the elections to the Northern Ireland Assembly on 7th March 2007 and the forthcoming elections to the Scottish Parliament and the National Assembly for Wales in May 2007. The new administrations will need to develop their positions on this Bill, and the intent is not in any way to compromise their positions, while being in a position to legislate quickly once the new devolved administrations have been formed.

COMMENTARY ON CLAUSES

Part 1: Carbon Target and Budgeting

The target for 2050

Clause 1: The target for 2050

18. This clause creates a duty on the Secretary of State to reduce the "net UK carbon account" to meet a target, and allows the target to be amended by secondary legislation in certain circumstances.

19. *Subsections (1) and (2)* of this clause create a duty on the Secretary of State to ensure that "the net UK carbon account" (defined in clause 18 as net UK emissions less "carbon credits" plus "carbon debits", both of which are defined in clause 16) is at least 60% lower than the "1990 baseline" which is defined as the net amount of carbon dioxide emitted in 1990.

20. *Subsections (3) to (5)* allow the Secretary of State to amend the 2050 target. An order amending the target is to be made by affirmative resolution statutory instrument (i.e. before the order is made, there must be a debate and vote approving the order in both Houses of Parliament). Such an order may only be made if there have been significant developments in scientific knowledge about climate change, or in international law or policy. This power might be used, for example, in the event of a new international treaty on climate change.

21. The target for 2050 is set by reference to a 1990 baseline rather than a particular quantum of emissions because the baseline itself is subject to revision as understanding of historic emissions improves. This is the baseline used for emissions of carbon dioxide under the Kyoto Protocol, an international agreement to limit emissions of greenhouse gases, to which the UK is party.

Carbon budgeting

Clause 2: Carbon budgets

22. This clause creates a duty for the Secretary of State to set "carbon budgets", defined as an amount for the net UK carbon account for a given period (i.e. a "budgetary period"). The Secretary of State must set three consecutive five-year carbon budgets for the periods 2008-12, 2013-2017 and 2018-2022 by the end of 2008. It also creates a duty to set subsequent carbon budgets at least 11.5 years ahead. The intent of the clause is to provide certainty around the UK's carbon budget – on average – at least 15 years ahead.

23. *Subsection (1)* contains the duty to set and to stay within carbon budgets. *Subsection (2)* prescribes a time by which the first three budgets must be set and how to calculate the time by which later budgets must be set.

Clause 3: Level of carbon budgets

24. This clause sets out how the levels of carbon budgets should be set and the circumstances in which they may be amended.

25. *Subsection (1)* sets out the requirement for carbon budgets to be consistent with certain emissions levels in particular years: paragraph (a) requires that the "annual equivalent of the carbon budget" for the carbon budget covering the year 2020 is at least 26% and no more than 32% lower than the 1990 baseline; paragraph (b) requires that the "annual equivalent of the carbon budget" for the carbon budget covering the year 2050 is no more than the level specified in clause 1 compared with the 1990 baseline (60% below 1990 levels, unless amended under clause 1(3)); paragraph (c) provides the Secretary of State with a power to set further maximum and or minimum constraints as a percentage of the 1990 baseline after 2050 through secondary legislation.

26. *Subsection (2)* explains that the "annual equivalent" of a given carbon budget is the total carbon budget for a period divided by the number of years in that period.

27. *Subsections (3) and (4)* give the Secretary of State the power to amend the constraint set in subsection (1)(a), and any constraints in subsection (1)(c), by order, if there have been significant developments in scientific knowledge about climate change, or in international law or policy.

28. *Subsection (5)* prescribes that orders made under subsections (1)(c) and (3) are subject to affirmative resolution procedure.

Clause 4: Setting of carbon budgets for budgetary periods

29. This clause requires the Secretary of State to set carbon budgets through affirmative resolution orders.

30. *Subsection (2)* requires that every carbon budget must be set at a level which enables the target set in clause 1, the requirements set in clause 3 and compliance with the international obligations of the UK, (i.e. any international treaties to which the UK is a signatory) to be achieved.

31. *Subsection (3)* requires the Secretary of State to seek, and take account of, the advice of the Committee on Climate Change before making any decision on the level of carbon budgets.

Clause 5: Matters to be taken into account in connection with carbon budgets

32. This clause sets out matters that the Secretary of State must take into account when making decisions about carbon budgets and which the Committee on Climate Change must take into account in advising the Secretary of State on these decisions.

33. *Subsection (2)* sets out these matters. These are intended to exemplify the broad range of relevant factors that will inform any decision relating to carbon budgeting. *Subsection (3)* makes it explicit that this clause does not limit the general requirement for the Secretary of State and the Committee on Climate Change to take *all* relevant matters into account.

Clause 6: Duty to report on proposals and policies for meeting carbon budgets

34. This clause places a duty on Government to lay a report before Parliament setting out its proposals and policies for meeting the current and future carbon budgets. This clause aims to enshrine transparency in the system, so that Parliament is clear about how the Government intends to achieve its new obligations.

Determination whether objectives met

Clause 7: Annual statement of UK emissions

35. This clause places a duty on the Secretary of State to lay a report before Parliament on UK emissions in respect of every year from 2008 onwards. Finalised figures for UK

emissions, including a full inventory report, are currently produced, and submitted to the EU by the Government on 15th March (14.5 months after the end of calendar year in question). The report under this clause must therefore be laid no later than the 31st March in the second year after the year to which it relates (i.e. the report for 2008 must be laid by 31st March 2010).

36. *Subsection (2)* specifies that this report must set out: UK carbon dioxide emissions, UK carbon dioxide removals and net UK carbon dioxide emissions. These terms are defined in clause 14. *Subsection (3)* provides that where there has been a change in the international method of calculating emissions levels that requires the adjustment of emissions levels in earlier years in the budget period, then the report should set out the adjusted figures.

37. *Subsection (4)* specifies that the report must also set out the cumulative total of carbon credits (as defined in clause 16) up to the date of the report used towards meeting the carbon budget, and give details of the carbon credits used. *Subsection (5)* specifies that the report must state the total amount of carbon debits (also defined in clause 16), as at the date of the statement, which are to be taken into account in calculating the net UK carbon account for the relevant budgetary period. *Subsection (6)* provides that the report must also state the net UK carbon account for the relevant budgetary period.

Clause 8: Powers to carry amounts from one budgetary period to another

38. This clause provides a power for the Secretary of State to 'bank' and 'borrow' emissions between budgetary periods.

39. *Subsection (1)* allows the Secretary of State to carry back a limited part of a carbon budget to the preceding budgetary period, in so doing increasing the budget for that period and reducing the next by the same amount (i.e. borrowing).

40. *Subsection (2)* limits the amount that can be 'borrowed' under subsection (1) to no more than 1% of budget borrowed from.

41. *Subsection (3)* allows the Secretary of State to carry forward any part of the carbon budget that exceeds the net UK carbon account for that period (i.e. banking).

42. *Subsection (4)* requires the Secretary of State to obtain the advice of the Committee on Climate Change, and take this advice into account, before exercising powers under this clause, i.e. before 'banking' or 'borrowing'.

43. *Subsection (5)* places a back-stop on when the powers in the clause can be used to no later than 31st May in the second year after the earlier budget period ends. This is the same date as that on which a determination is made on whether the budget has been met.

Clause 9: Final figures for budgetary period

44. This clause places a duty on the Secretary of State to report the final figures for emissions during a budgetary period and how the determination of whether a budget has been met will be made.

45. *Subsections (1) to (6)* place a duty on the Secretary of State to report:

- under *subsection (2)*, the final amounts of UK carbon dioxide emissions and removals and net UK carbon dioxide emissions (this total may differ slightly from the sum of the net emissions for each of the years within the budgetary period, if there has been a change in the methodology internationally for how the 1990 baseline or emissions are calculated (see clause 7(3));
- under *subsection (3)*, the amount of carbon credits that have been used to count against emissions in that period, and details of the number and type of those credits;
- under *subsection (4)*, the final amount of carbon debits to be taken into account for the budgetary period;
- under *subsection (5)*, the net UK carbon account for the budgetary period (i.e. the UK emissions, as increased by carbon debits and decreased by carbon credits);
- under *subsection (6)*, if the Secretary of State has decided to borrow (using the power in clause 8(1)) from the next period, if so by what amount; and
- under *subsection (7)*, the amount of the budget, which will be the level of the budget as originally set, subject to any banking or borrowing under clause 8 and any alternation of the budget under clause 13.

46. *Subsection (8)* provides that the point at which this statement is laid is the point at which the determination will be made as to whether the budget has been met.

47. *Subsection (9)* sets a back-stop, requiring the Secretary of State to lay before Parliament the statement no later than the 31st May in the second year after the end of a budgetary period (e.g. no later than 31st May 2014 for the 2008-2012 budget).

Clause 10: Final figures for 2050

48. This clause places a duty on the Secretary of State to report to Parliament the final figures for emissions during 2050.

49. *Subsections (1) to (5)* place a duty on the Secretary of State to report:

- under *subsection (2)*, the final amounts of UK carbon dioxide emissions and removals and net UK carbon dioxide emissions for 2050;
- under *subsection (3)*, the amount of carbon credits that has been used to count against emissions for 2050, and details of the number and type of those credits;
- under *subsection (4)*, the final amount of carbon debits to be taken into account;
- under *subsection (5)*, the net UK carbon account for 2050.

50. *Subsection (6)* provides that the point at which this statement is laid is the point at which the determination will be made as to whether the target for 2050 (as defined by clause 1) has been met.

51. *Subsection (7)* sets a back-stop, requiring the Secretary of State to lay before Parliament the statement no later than the 31st May in the second year after the target year (i.e. 31st May 2052).

Supplementary provisions

Clause 11: Response to Committee's reports on progress

52. This clause places a duty on the Secretary of State lay before Parliament a response to each annual progress report of the Committee on Climate Change (see clause 21).

53. *Subsection (2)* requires that this response must be laid no later that the 15th October in the year the Committee's report was made (the Committee being obliged to report by 30th June). *Subsections (3) and (4)* allow this deadline to be changed by negative resolution statutory instrument (i.e. a statutory instrument that comes into force unless either House of Parliament votes against it). This is a provision is to allow flexibility (e.g. it might be used to allow for the consequences of future international treaties on climate change necessitating a change to the date when the Committee makes its report).

Clause 12: Alteration of budgetary periods

54. This clause allows, in certain circumstances, for the duration of budgetary periods and their start and end dates to be changed by affirmative resolution statutory instrument.

55. *Subsection (2)* prescribes the circumstances when this power can be exercised. These are when a change to the budgetary periods is needed to keep them in line with similar periods under international agreements to which the UK is a party.

56. *Subsection (4)* allows an order under subsection (2) to make consequential amendments to other parts of the Bill in order to ensure coherence of the provisions.

Clause 13: Alteration of carbon budgets

57. This clause gives the Secretary of State the power, via affirmative resolution statutory instrument, to amend the level of carbon budgets in certain circumstances. The clause also limits the conditions in which orders setting carbon budgets can be revoked.

58. *Subsection (1)* prevents any carbon budget being revoked after the final date by which it had to be set in accordance with clause 2(2).

59. *Subsection (2)* provides that the Secretary of State may only alter a budget after obtaining and taking into account the advice of the Committee on Climate Change.

60. *Subsection (3)* gives the Secretary of State the power to amend budgets, but limits the circumstances in which such an order can be made. A budget may only be amended if there have been significant changes in the factors on the basis of which the decision to set, or previously amend, the budget was made.

61. *Subsection (4)* limits the circumstances in which an order amending a budget after the start of the relevant budgetary period can be made. A budget may only be amended after the start of the budgetary period if there have been significant changes, since the budget period began, in the factors on the basis of which the decision to set or previously amend the budget was made. This is a more stringent test than in subsection (3) because there will typically have been less time for a significant change to happen.

62. *Subsection (5)* places a back-stop on when budgets can be amended. *Subsection (6)* requires any order amending budgets to follow the affirmative resolution order procedure.

Interpretation

Clause 14: Carbon dioxide emissions and carbon dioxide removals

63. This clause defines the terms "carbon dioxide emissions", "UK carbon dioxide emissions", "UK carbon removals" and "net UK carbon dioxide emissions" used in Part 1 of the Bill. *Subsection (2)* provides that UK emissions and removals shall be determined following international protocols, such as the United Nations Framework Convention on Climate Change (UNFCCC) Reporting Guidelines on Annual Inventories. While there are non-anthropogenic sources of greenhouse gases (e.g. volcanic activity), emissions only count for the purposes of this Bill if they are emissions of greenhouse gases from anthropogenic sources.

Clause 15: Emissions from international aviation and shipping

64. This clause makes provision about carbon dioxide emissions from international aviation or shipping. *Subsection (1)* provides that such emissions are not to count as UK emissions for the purposes of Part 1, except as provided for by regulations. The Secretary of State may define what is meant by "international aviation or shipping" by negative resolution order under *subsection (2)*.

65. *Subsection (3)* gives the Secretary of State the power to make regulations (under the affirmative resolution procedure) that would allow emissions from international aviation or shipping to count as UK emissions. This power may only be exercised in the event of a change in international carbon reporting practice relating to aviation or shipping. The regulations may also make provision about how the 1990 baseline is to be affected if such emissions are included for the purposes of Part 1 (see *subsections (4) and (5)*).

Clause 16: Carbon credits and carbon debits

66. In addition to the UK's level of net carbon dioxide emissions (as determined in accordance with clause 14), the "net UK carbon account" (as determined in accordance with clause 16) is affected by "carbon credits" (which will reduce the net carbon account) and "carbon debits" (which will increase it). This clause defines those two terms, although the circumstances in which carbon credits and debits will affect the net UK carbon account will be set out in regulations made by the Secretary of State (see *subsection (1)*).

67. *Subsection (2)* requires that credits must be amounts representing reductions in greenhouse gas emissions, removals of greenhouse gases from the atmosphere, or amounts of greenhouse gas emissions allowed under a scheme or agreement imposing a limit on greenhouse gas emissions (for example, Assigned Amounts Units (AAUs) under the Kyoto Protocol). Carbon credits relate to emissions reductions (or unused allowances) occurring outside the United Kingdom but being eligible for compliance in the UK. So regulations could provide that if a person in the United Kingdom pays for a reduction in emissions elsewhere (for example by buying a unit under an emissions trading scheme), this amount will decrease the net UK carbon account.

68. *Subsection (3)* makes corresponding provision about carbon debits. Carbon debits relate to emissions reductions (or unused allowances) occurring in the United Kingdom but which are used to for compliance in another country. As an example, a carbon debit might be added to the net UK carbon account where a UK Assigned Amount Unit under the Kyoto Protocol is sold abroad under an emissions trading scheme and an equivalent unit is not retired or cancelled in the UK.

69. *Subsections (4) and (5)* make further provision as to what the regulations must contain in relation to the detailed description of credits and debits.

Clause 17: Carbon credits and carbon debits: supplementary
70. This clause gives further information about the regulations that may be made under clause 16.

71. *Subsection (2)* allows the regulations to provide for a registration scheme for credits and debits, which may be administrated by an existing or new body. The regulations may require users of the scheme to pay fees towards the costs of its operation.

72. *Subsections (5) and (6)* explain what procedure is to be used for regulations under clause 16. If the regulations amend primary legislation (which may be the case if an existing body is appointed as the scheme administrator - see *subsection (3)*), affirmative resolution procedure must be used; in all other circumstances, negative resolution procedure may be used.

Clause 18: Net UK carbon account
73. This clause defines the term "net UK carbon account" for a budgetary period as net UK carbon dioxide emissions (as defined in clause 14) as decreased by any carbon credits used to offset net UK carbon dioxide emissions and increased by any carbon debits.

Part 2: The Committee on Climate Change

The Committee

Clause 19 and Schedule 1: The Committee on Climate Change
74. This clause establishes the Committee on Climate Change and introduces Schedule 1.

75. Schedule 1 sets out the constitution of the Committee on Climate Change, and includes provisions about its status, membership, chief executive and other employees, pay and pensions, procedure, accounts and annual reports.

Functions of the Committee

Clause 20: Advice in connection with carbon budgets
76. This clause sets out the Committee on Climate Change's advisory duties in relation to carbon budgets, and the timing of the advice which must be given.

77. *Subsection (1)(a)* provides that the Committee must advise on the levels at which carbon budgets should be set. *Subsection (1)(b)* requires the Committee to advise on the extent to which budgets should be met by reducing the level of net UK carbon dioxide emissions or by the use of carbon credits. *Subsection (1)(c)* gives the Committee a duty to advise on the contributions towards meeting carbon budgets that should be made by sectors of the economy covered by trading schemes and by other sectors.

78. *Subsection (2)* gives the Committee a duty to advise the Secretary of State on whether the optimal pathway towards meeting the target for 2050 is consistent with meeting a separate target of reducing emissions to 20% below the 1990 baseline in the budgetary period encompassing 2010 (i.e. for the annual equivalent of the 2008-2012 budget period) and to set out what the costs and benefits would be of setting a budget consistent with such a target.

79. *Subsection (3)* sets out the timing of the advice to be given under this clause.

Clause 21: Reports on progress

80. *Subsection (1)* requires the Committee on Climate Change to make an annual report to Parliament containing its assessment of the progress which is being made towards meeting the carbon budgets and the target for 2050 in clause 1 (i.e. unless amended, to reduce the net UK carbon account to 60% below 1990 levels). In compiling this report the Committee may make use of all relevant data available at that time including provisional emissions data and energy statistics and trends.

81. *Subsection (2)* requires the Committee to include data relating to the previous budgetary period, and its views on the manner in which the Secretary of State exercised his functions during that period, in the report in the second year after the end of a budgetary period (i.e. for the 2008–12 budget period, in 2014).

82. *Subsections (3) to (5)* provide that reports under this clause must be made by 30th June each year, and allow the Secretary of State, by order, to amend the timing of the report.

Clause 22: Duty to provide advice or other assistance on request

83. *Subsection (1)* requires the Committee to provide advice, analysis, information or other assistance, when requested to do so, on the Secretary of State's functions under the Bill, on progress towards meeting the Bill's objectives and on climate change generally. *Subsection (2)* gives specific examples of what may be required of the Committee, including advice on caps on activities under trading schemes, assistance in the preparation of statistics and advice on whether and how to legislate in relation to other greenhouse gases.

Supplementary provisions

Clause 23: General ancillary powers

84. *Subsection (1)* gives the Committee on Climate Change the power to do anything that appears to it necessary or appropriate for the purpose of, or in connection with, the carrying out of its functions. *Subsection (2)* sets out examples to illustrate the scope of the power.

Clause 24: Grants to the Committee

85. This clause enables the Secretary of State to fund the Committee on Climate Change. The Secretary of State may impose conditions when giving a grant (for example, a condition

requiring the Committee to supply a financial memorandum or enter into a management agreement).

Section 25: Power of Secretary of State to give guidance

86. This clause gives the Secretary of State power to give guidance to the Committee on Climate Change about how to carry out its functions. The Committee on Climate Change is required to have regard to guidance issued to it by the Secretary of State.

Clause 26: Power of Secretary of State to give directions

87. This clause gives the Secretary of State power to give general or specific directions to Committee on Climate Change. The Committee on Climate Change must comply with directions given under this section. *Subsection (2)* provides that the Secretary of State may not direct the Committee as to what its advice should be or what a progress report should say.

Part 3: Trading Schemes

Trading schemes

Clause 28: Trading schemes

88. This clause provides the Secretary of State with a power to set up trading schemes relating to greenhouse gas emissions though secondary legislation. S*ubsection (2)(a)* provides for trading schemes to limit activities that consist of the emission of greenhouse gases, or directly or indirectly lead to such emissions (for example, "cap and trade schemes" which cap emissions from a particular set of activities and allow trading of emissions within the cap). *Subsection (2)(b)* provides for trading schemes to encourage activities that directly or indirectly lead to a reduction in greenhouse gas emissions or the removal of greenhouse gases from the atmosphere.

Clause 29: Activities to which trading schemes may apply

89. This clause sets out what activities are regarded as indirectly causing or contributing to greenhouse gas emissions or reductions in greenhouse gas emissions. It also makes provision in relation to the location of activities and emissions covered by this Part.

90. *Subsection (1)* sets out the types of activity which are considered to be indirect causes of, or contributors to, greenhouse gas emissions, such as activities which involve the use of energy whose production directly led to greenhouse gas emissions or those involving the supply of something the use of which would lead to greenhouse gas emissions. For example the supply of a heating fuel would be regarded as indirectly causing emissions because it leads to emissions at the point of use by the consumer. *Subsection (2)* provides that reductions in the level of those activities are to be regarded as indirectly causing or contributing to reductions in greenhouse gas emissions.

91. *Subsection (3)* provides that Part 3 of the Bill applies to activities carried out in the United Kingdom, regardless of where emissions, or reductions in emissions, actually occur.

Clause 30 and Schedule 2: Matters that may or must be provided for in trading schemes
92. *Subsections (1) and (2)* introduce Schedule 2 to the Bill, which specifies matters which may or must be provided for in regulations made under this Part of the Bill.

93. *Schedule 2* makes specific provision on what must or may be included in regulations establishing trading schemes intended to reduce activities which cause or contribute to greenhouse gas emissions (Part 1 of Schedule 2) and trading schemes intended to encourage activities which lead to reductions in emissions of greenhouse gases (Part 2 of Schedule 2). Part 3 of Schedule 2 makes provision in relation to the administration of trading schemes, including the maintenance of registers and enforcement and penalty provisions.

94. *Subsection (3)* provides that regulations may also make provision about their application to the Crown.

Clause 31: Procedure for making regulations
95. This clause sets out the procedure which must be followed when regulations containing a trading scheme are made or amended. It includes requirements to consult persons likely to be affected by the scheme, a requirement to seek advice from the Committee on Climate Change and rules on Parliamentary procedure.

96. *Subsections (1) and (2)* provide that before making regulations about trading schemes, the Secretary of State must consult such persons as he considers are likely to be affected by the regulations, and also that he must seek, and take account of, the advice of the Committee on Climate Change on the levels of any limit on activities under the scheme.

97. *Subsections (3) and (4)* set out the circumstances in which the affirmative resolution procedure applies to the making of regulations (such as where a new scheme is established, the application of an existing scheme is extended, or the burden on participants is increased), and provide that the negative resolution procedure applies at all other times.

Supplementary provisions

Clause 32: Power of Secretary of State to give guidance
98. This clause gives the Secretary of State power to give guidance to an administrator of a trading scheme about how to carry out its functions.

99. The administrator is required to have regard to guidance issued to it by the Secretary of State.

Clause 33: Power of Secretary of State to give directions
100. This clause gives the Secretary of State power to give general or specific directions to an administrator of a trading scheme.

101. The administrator must comply with directions given under this clause.

Clause 34: Grants to participants
102. This clause enables the Secretary of State to make grants to participants of trading schemes and impose conditions when giving a grant.

Interpretation

Clause 35: Interpretation of Part 3
103. This clause defines the terms "administrator", "participants" and "trading period" used in Part 3.

Clause 36: Power to make consequential amendments
104. This clause gives the Secretary of State power to make regulations amending, repealing or revoking primary or secondary legislation as a consequence of regulations made under this Part of the Bill, and to make any transitional and saving provisions in connection with such amendments, repeals and revocations.

Part 4: Miscellaneous and Supplementary Provisions

Miscellaneous

Clause 37: General duty to report on adaptation to climate change
105. This clause places a duty on the Secretary of State lay a report before Parliament, at least every five years, setting out the risks of the current and predicted impacts of climate change for the UK and the Government's proposals and policies for adapting to climate change.

106. *Subsection (2)* requires the Secretary of State lay the first report on adaptation before Parliament no later that three years after the Act comes into force, and then subsequent reports at intervals of no more than five years.

Supplementary provisions

Clause 38: International carbon reporting practice
107. This clause defines the term "international carbon reporting practice" as accepted practice under the United Nations Framework Convention on Climate Change (UNFCC) or other international agreements which the Secretary of State may specify via a negative

resolution statutory instrument. For example, a post-Kyoto agreement may be specified for the purposes of this clause. An order may supplement or replace the requirement to follow UNFCC practices.

Clause 39: Territorial scope of application

108. This clause provides for the Bill to apply to emissions occurring in "UK coastal waters" or on the UK sector of the "continental shelf" in the same way as it applies in the UK

109. *Subsection (2)* defines "UK coastal waters" as areas on the land side of the seaward limit of the territorial sea adjacent to the UK (i.e. out to 12 nautical miles), and "the UK sector of the continental shelf" by reference to section 1(7) of the Continental Shelf Act 1964 (i.e. broadly, out to 200 nautical miles or the half-way point between countries whichever is closer).

110. *Subsection (3)* provides that this clause is subject to clause 15(1), which provides that emissions from international aviation and shipping are not to be regarded as emissions from UK sources for the purposes of Part 1 of the Bill, unless this is provided for by regulations.

Clause 40: Financial provisions

111. *Subsection (1)* provides that money spent by the Secretary of State on the acquisition of carbon credits and on making grants to the Committee on Climate Change or to participants in trading schemes may be paid out of money provided by Parliament. This subsection also provides cover for expenses of any other government departments in consequence of the Bill.

112. *Subsection (2)* requires that the proceeds of any fees charged under the Bill must be paid into the Consolidated Fund by the Secretary of State. Where fees are collected by someone other than the Secretary of State (e.g. an administrator of a trading scheme made in regulations under Part 3) they must be paid to the Secretary of State who must then pay them into the Fund. The effect of this is to ensure that all monies collected under the Bill are paid into to the general government fund rather than departmental funds; this is current Government policy.

Clause 41: Orders and regulations

113. This clause makes general provision in respect of any orders or regulations to be made under the Bill. It defines the terms "affirmative resolution procedure" and "negative resolution procedure". *Subsection (6)* provides that the affirmative resolution procedure may be used wherever the negative resolution procedure is stipulated, at the Government's discretion, to allow combined instruments.

Clause 42: General interpretation

114. This clause defines the terms used in the Bill, including "greenhouse gas", "greenhouse gas emissions" and "fuel poverty". The definition of greenhouse gases follows

that used in the Kyoto Protocol. It includes: hydroflurocarbons (partly fluorinated hydrocarbons), perflurocarbons (fully fluorinated hydrocarbons), nitrous oxide, methane and sulphur hexafluoride. More information about greenhouse gases can be found at: http://www.defra.gov.uk/environment/climatechange/about/g-gases.htm.

115. *Subsection (2)* requires that emissions of greenhouse gases are to be measured or calculated in "tonnes of carbon dioxide equivalent" (defined in *subsection (3)*); this is to allow for the differing relative forcing effects and atmospheric lifetimes of differing greenhouse gases, for example over 100 years, a tonne of methane has 33 times the global warming effect than carbon dioxide. These factors are known as "Global Warming Potentials" (GWPs) more about which can be found at the website cited in the paragraph above.

Final Provisions

Clause 43: Extent
116. The Bill extends to the whole of the UK: for more information see the sections on territorial extent above and territorial application below, as well as the section on devolution in the consultation document accompanying this draft Bill.

Clause 44: Commencement
117. This Bill has been drafted so that all the provisions will come into force on a date two months after Royal Assent. The Bill as introduced may seek to commence some provisions earlier than this to allow the Committee on Climate Change to be established and carbon budgets to be set quickly as possible after Royal Assent.

FINANCIAL EFFECTS AND EFFECTS ON THE NUMBER OF PEOPLE WORKING IN PUBLIC SERVICE

118. The Regulatory Impact Assessment (attached) has only identified very small *direct* changes in public service manpower with the new Committee on Climate Change creating roughly 15-20 new posts. Similarly the *direct* effect of the Bill on public expenditure is small with the Committee on Climate Change initially requiring approximately £2.25m p.a. in running costs. This is expected to fall to around £2m in later years.

119. The Bill sets the framework for managing down the carbon dioxide emissions from the UK. As such the Bill will also have *indirect* impacts associated with policy interventions associated with managing emissions, each of which will be subject assessments of expenditure, staffing and regulatory impact, but which are set out at high level in the partial Regulatory Impact Assessment that accompanies this draft Bill.

SUMMARY OF THE REGULATORY IMPACT ASSESSMENT

120. See the partial Regulatory Impact Assessment accompanying this draft Bill. This contains a high level discussion of the costs and benefits of action to mitigate climate change to realise statutory reductions in CO_2 emissions of 60% by 2050 and 26-32% by 2020 (compared to 1990 levels) together with an analysis of the key drivers and uncertainties surrounding these assessments to inform the development of detailed draft proposals.

121. The analysis suggests that there is a strong case surrounding the potential for domestic commitments to: help foster the conditions for broader and deeper international cooperation; reduce the economic costs of mitigation by creating greater market certainty for UK households and firms; as well as by improving the capacity of Government to manage uncertainty when establishing mitigation objectives. Policies to reduce domestic emissions are also likely to confer ancillary effects in the form of increased energy security, improved air quality and reduced fuel poverty.

122. However, it is likely that there will be long and short run-costs associated with a transition to a low carbon economy. Preliminary analysis conducted as part of the forthcoming Energy White Paper 2007 (using the Markal-Macro model) suggests that the costs of achieving our 60% goal range between a 0.3-1.5% reduction in GDP by 2050. Analysis suggests that the short-run GDP costs of increasing emissions reductions from the smoothed introduction of a carbon price sufficient to increase emissions reductions from 17% to 30% by 2020 could be around 1.6%.

123. Overall, the distribution of impacts from implementing the proposed carbon management framework is likely to be uneven, with a small number of energy intensive industries impacted substantially more than other areas of the economy such as commercial and residential sectors. In addition, sectors of the economy such as environmental consultancy and financial services, are likely to benefit from more robust mitigation frameworks, especially if these are replicated internationally. However, the distributional effects are likely to be strongly influenced by the choice of policy instrument: regulation, market mechanisms and fiscal incentives will have divergent distributional impacts.

EUROPEAN CONVENTION ON HUMAN RIGHTS

124. The Secretary of State has concluded that Bill is compatible with the European Convention on Human Rights and has made a statement to that effect.

TERRITORIAL APPLICATION

125. The devolution settlement with respect to climate change policy is complex: while elements of energy policy[1] and international relations are reserved, matters environmental policy is, to varying degrees, devolved to the Scottish Parliament, and the Welsh and Northern Ireland Assemblies.

126. This draft Bill extends to the whole of the UK. It has been drafted for the purposes of the consultation with all powers and duties appearing to rest with the Secretary of State. This approach has been taken – with the agreement of each of the devolved administrations – to enable consultation and debate to proceed on this matter while recognising the elections to the Northern Ireland Assembly on 7th March and the forthcoming elections to the Scottish Parliament and the Welsh Assembly in May. The new administrations will need to develop their positions on this Bill, and the intent is not in any way to compromise their positions, while being in a position to legislate quickly once the new devolved administrations have been formed.

127. Before the Bill is introduced into the UK Parliament, agreement from each of the devolved administrations on how to handle the devolved aspects of the Bill will need to be reached and the Bill amended accordingly.

128. The consultation document accompanying the Bill asks for views on how the devolution implications of the Bill might be addressed, as with the other representations to this consultation, any responses to these questions will be shared with the devolved Administrations and will inform how this aspect of the final Bill is addressed.

COMMENCEMENT DATE

129. See clause 44 of the Bill and commentary above. This Bill has been drafted with all provisions coming into force on a date two months after Royal Assent. The Bill as introduced may seek to commence provisions earlier than this convention to allow the Committee on Climate Change to be established and carbon budgets to be set quickly as possible after Royal Assent.

[1] Energy policy is not reserved for Northern Ireland.

Draft Climate Change Bill

Partial Regulatory Impact Assessment

March, 2007

Contents

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1. Executive Summary

1.1 There is a large body of scientific evidence highlighting the serious and urgent nature of climate change resulting from emissions of greenhouse gases (GHGs), particularly from combustion of fossil fuels and changes in the patterns of land use. Unabated, the projected increases in atmospheric concentrations of GHGs are likely to have severe effects on human welfare and, potentially, risk catastrophic impacts.

1.2 In economic terms, the Stern Review estimated that the costs of inaction on climate change significantly outweigh the expected costs of coordinated global action. Without efforts to tackle climate change, the Review predicts that it could cost the global economy between 5% and 20% of GDP now and forever, compared to much lower estimated costs of global action to stabilise atmospheric concentrations (at 550ppm CO_2e) of around 1% of Gross Domestic Product (GDP) by 2050, within a range of +/- 3%, now and forever.[1] This contrast between, in the long-run, the higher costs of inaction and the lower costs of action provide a fundamental rationale for the Government's proposals in the Climate Change Bill.

Summary of benefits and costs

1.3 The analysis contained within this partial Regulatory Impact Assessment (RIA) suggests that the proposals contained within the draft Climate Change Bill have the following potential **benefits**:

- ***create a strengthened framework for managing carbon in the economy so as to minimise mitigation costs***: The proposed carbon management framework provides for a strengthened institutional framework, including a new independent *Committee on Climate Change* to provide transparent advice and analysis, in order to identify and facilitate delivery of the least cost mitigation trajectory, with a view to minimising the adverse impacts on the economy, competitiveness, social impacts and relevant policy goals. The framework combines the increased certainty of statutory targets with a number of flexibilities aimed at minimising the risks to the UK of unilateral action and bolstering the credibility of the framework;

- ***promote investment in low-carbon technologies and behaviours through increased certainty***: Statutory domestic targets reduce uncertainty surrounding the implementation of policies to ensure the future achievement of emissions reductions. This results, in part, from the current absence of an international framework extending beyond 2012 and perceived risks surrounding the delivery of existing non-statutory targets and milestones. The statutory framework has the potential to promote investment in low-

[1] Stern Review cost assessments are based on a global perspective and assuming collective action. They are expressed in terms of a *balanced growth equivalent* which measures the welfare of action or inaction in response to climate change arising from an impact on consumption over time, in terms of the amount of consumption today which would deliver the same amount of utility. As such, this is a slightly different measure from the GDP indicator used in relation to the UK long run and transition cost modelling.

carbon technologies and reduce the risk of 'lock in' to carbon intensive patterns of production and consumption; and

- ***encourage conditions for international cooperation***: Climate change is an international collective action problem and there are economic risks where action is unilateral. However, leadership from developed countries is critical to securing a future multilateral global framework. Up front legal commitments by the UK to reduce emissions, in a way that is consistent with continuing economic and social prosperity, is intended to encourage reciprocal effort from other countries, including our international trading partners. The UK will actively promote this through engagement with trading partners within the EU and internationally.

1.4 The implementation of measures to achieve the targets in the draft Bill (and to stay within statutory carbon budgets) is likely to result in some **costs** to the UK both in the long term and in the medium and short run, resulting from the need to undergo a transition to a lower carbon economy. However, given that the draft Bill sets out a *framework* for carbon management and does not assume a precise trajectory to 2050 or pre-judge the specific policies required to achieve these goals, it is only feasible to discuss these impacts in a high-level and illustrative way.

1.5 Quantitative analysis at this stage is therefore intended only to provide a high level *indication* of the possible scale of costs. Preliminary results from research undertaken as part of preparations for the forthcoming 2007 Energy White Paper indicate that:

- The long run costs to the UK of achieving a 60% reduction in carbon emissions, through domestic and international effort, by 2050 are likely to be within the range indicated by Stern's assessment of global costs of around 1% of GDP by 2050 (and beyond), within a range of +/- 3%.

- There could be additional shorter term transition costs (i.e. between now and 2020) associated with progress towards long run objectives which are in the upper range of those highlighted by the Stern Review analysis (which focused on the long term costs in 2050).

- Both short and long run costs could be unevenly distributed, with a small number of energy intensive industries affected more significantly (particularly those exposed to international competition), whereas less energy intensive areas of the economy, such as service and residential sectors, are likely to be much less affected. These effects may be offset by stronger inducements to raise energy efficiency and innovate. Other sectors, such as environmental consultancy and financial services, may have opportunities to benefit from more robust mitigation frameworks, especially if these are replicated internationally.

1.6 The precise costs to the UK are also dependent on a number of factors, including: fossil fuel prices; the cost and availability of low-carbon technologies; the degree of multilateral action; the choice of policy instrument; and, (particularly in the case of transition costs) the emissions reduction path chosen.

1.7 This partial RIA considers these issues in more detail, and explores their implications for the desirability of a flexible policy framework which actively assesses, manages and, where necessary, reviews the optimal pathway and delivery of transition to a low-carbon economy.

1.8 Finally, there are expected to be administrative costs associated with the implementation of these proposals, in particular associated with the establishment and management of a new independent body – the Committee on Climate Change. These are expected to be in the region of £2.25m in the first year and £2m annually thereafter.

Table 1 Summary of Benefits and Costs

Measure	Benefits	Costs
Statutory targets to reduce emissions by 60%, through domestic and international effort, by 2050 and 26-32% by 2020, supported by a system of five-year carbon budgets established three periods ahead	Minimise mitigation costs through realisation of optimal emissions reduction pathway and maintenance of flexibility to respond to adverse or unexpected circumstances Increase business certainty surrounding future value of emissions reductions Demonstrate UK leadership on climate change internationally Create a strategic framework for policy management Encourage greater energy resource efficiency and other ancillary effects such as energy security	Long run mitigation costs expected to be consistent with range of mitigation costs identified by the Stern Review There could potentially be short and medium run transition costs (i.e. between now and 2020) which could be in the upper end of the range indicated by the Stern Review However, costs highly dependent on the choice of transition path as well as policy mix, and on uncertain factors such as fuel/ technology costs and degree of international commitment
	Expected growth in sectors of the economy such as financial and environmental services	Energy and trade intensive sectors (particularly those open to international competition) likely to be relatively most affected
The Committee on Climate Change	Improved institutional framework for transparent advice on emissions reduction trajectory and optimal balance of domestic abatement versus UK financed emissions reductions overseas	Management costs expected to be in the region of £2.25m in the first year and £2m annually thereafter.
Powers for Government to i) regularly purchase international emissions reductions credits	Facilitate flexibility so that emissions reductions can be achieved domestically or overseas, thereby reducing mitigation costs	Costs dependent on volume of credits purchased and future costs of emissions reductions credit (but overall reduction in mitigation costs)

ii) introduce trading schemes via regulations, if desirable in the future, through secondary legislation	Improve responsiveness of policy-making, by allowing new trading schemes to be developed without need for further primary legislation Reduce contingent administrative costs arising from need to introduce primary legislation in the event of introduction of new trading schemes in domestic markets	Limited administrative costs of preparing appropriate clauses
Annual report by Committee on Climate Change to Parliament on progress towards objectives to which Government has a duty to respond	Transparent information for Parliament and the public on progress towards emission reduction goals Government held accountable annually in Parliament	Limited administrative costs of additional reporting requirement
Report by Government on risks of the impact of climate change on the UK, and on its proposals and policies for adapting to climate change	Regular (every 5 years) report clearly outlining the adaptation strategy of the Government	Limited administrative costs of additional reporting requirement

2. Purpose and intended effect

2.0.1 This is a partial Regulatory Impact Assessment (RIA) of the proposed measures in the draft Climate Change Bill. These are summarised in Section 5.5 and outlined in detail in Sections 5.1 to 5.4 (as well as in the consultation document). The Climate Change Bill will be introduced as soon as Parliamentary time allows following the pubic consultation process and pre-legislative scrutiny, and we intend that the provisions in the final Bill (as intended in this draft), will come into force in Spring 2008.

2.0.2 A full RIA will be published prior to the introduction of the Bill, following the public consultation exercise. Comments on both the approach, as well as the detailed analysis included in this document, are welcomed as part of this exercise. The development of this partial RIA has been conducted in accordance with current best regulatory practice, and has been subject to comment and advice from better regulation specialists.

2.1 Objectives

2.1.1 The proposals contained within the draft Climate Change Bill are intended to create a legislative framework which minimises the cost of mitigation to the UK, in particular by:

- facilitating delivery of the optimal emissions reduction trajectory as well as balance of domestic abatement versus UK financed emissions reductions overseas;
- providing greater clarity and certainty for UK industry to plan effectively for, and invest in, a low-carbon economy; and,
- strengthening conditions for strategic management of policy.

2.1.2 In addition, it is intended to maximise the UK's leadership internationally to help raise the ambition and urgency of collective action.

2.2 Background

International and scientific context

2.2.1 As outlined in the consultation document, there is an overwhelming body of scientific evidence highlighting the serious and urgent nature of climate change, largely due to emissions of greenhouse gases (GHGs) as a result of human activities such as the combustion of fossil fuels and changing patterns of land use. The most recent Intergovernmental Panel on Climate Change (IPCC) report, published in February 2007,[2] shows conclusively that the debate over the science of climate change has moved on from whether or not it is happening to what we need to do about it.

[2] Working Group I Contribution to the Fourth Assessment Report: *Climate Change 2007: The Physical Science Basis*, available from: http://www.ipcc.ch. The reports of the other working groups, and the Fourth Assessment Report (AR4) will be released in the course of 2007.

2.2.2 The international community has already begun a coordinated response to the challenge. The Kyoto Protocol, an agreement to reduce GHG emissions, was signed under the United Nations Framework Convention on Climate Change in December 1997. Its long run objective is the "stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".[3]

2.2.3 Under the Protocol, "Annex I" signatories (a number of industrialised countries including the UK, other European Union (EU) member states, Canada and Japan) agreed to reduce their collective expected GHG emissions by 5.2% between 2008 and 2012 (compared to the year 1990).[4] However, as the Stern Review amply demonstrated, it is now clear that international cooperation must go much further to achieve atmospheric stabilisation at levels sufficient to avoid unacceptable levels of environmental risk.

2.2.4 As such, it is imperative to build on the existing international frameworks. Key objectives include: the establishment of a second commitment phase extending beyond 2012, involving a broader set of signatories (such as the US and Australia) together with a larger number of "Annex I" countries prepared to accept a share of the responsibility for emissions reductions. However, individual countries must demonstrate the willingness and the capacity to reduce emissions in order to help create the conditions for such sustained multilateral cooperation in the medium to long term.

2.2.5 This leadership must come from the major developed economies such as the UK which have been responsible for the majority of the historic rise in GHG concentrations, generally have higher per capita emissions, and have income levels and the technological capacity to lead the necessary investment. The Stern Review estimated that developed countries should take responsibility for GHG emissions reductions of between 60 and 80% (compared with 1990 levels) by 2050. In addition, to a wide range of ambitious domestic measures, for example as part of the Climate Change Programme,[5] the UK has already demonstrated leadership in the multilateral context (see Section 4.1 for details).

Managing domestic policy in the context of international uncertainty

2.2.6 Currently, there is significant uncertainty surrounding the degree of climate change mitigation that will be undertaken in the future. This is, in part, because no international agreement yet exists beyond 2012 (as a successor to Kyoto). Uncertainty is also generated because there is, as yet, no defined commitment as part of further phases of the EU-ETS. The principal doubt relates to the existence of a carbon price, but also applies to the strength of the incentive for low-carbon investment. Such uncertainty is likely to increase the returns required by households and particularly firms when making low-carbon investment decisions, risking continued high levels of investments in carbon-intensive capital.

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[3] 1992 United Nations Framework Convention on Climate Change

[4] 1990 is the base year for carbon dioxide, methane and nitrous oxide. For the other greenhouse gases in the Kyoto basket (known as F-gases) the base year is 1995

[5] Available from: http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

2.2.7 The draft Bill proposes to enshrine domestic commitments in statute. These commitments would be reinforced by the implementation and management of credible policies, such as those included as part of the forthcoming 2007 Energy White Paper, which have the potential to deliver the proposed statutory objectives. Together the emissions reduction framework and associated policies would reduce uncertainty surrounding the intention of current and future Governments to institute domestic policies to realise these goals. This would in turn increase **certainty** for UK households and particularly firms investing in the UK.

2.2.8 The mitigation framework needs to balance the objectives of minimising uncertainty for UK households and firms, and retaining sufficient flexibility to ensure that mitigation is not unnecessarily costly. This is especially true given that our emissions reduction targets could remain more stringent than those of other countries, risking a loss to UK competitiveness. The draft Climate Change Bill contains a range of proposals designed to provide this flexibility, for example through the allowance of banking and limited borrowing of emissions rights across carbon budget periods, and through allowing emissions reductions to be achieved overseas through trading and purchasing of international emissions reduction credits, thereby utilising least-cost abatement options overseas (all of these mechanisms are discussed further in Section 5).

2.2.9 This partial RIA contains a high level discussion of the costs and benefits of action to mitigate climate change to a degree consistent with the Government's established medium and long term objectives, together with analysis of the key drivers and uncertainties surrounding these assessments which inform the detailed proposals within the draft Bill. However, the proposals contained within this draft Bill do not pre-judge the trajectory and specific policies required to achieve these goals. The Committee on Climate Change will be tasked with producing a full assessment of the wide range of potential impacts when advising on the level of carbon budgets, and the Government will be required to consider these impacts carefully before reaching a final decision on setting budgets in legislation (see Part 1 of the draft Bill). These impact assessments will be made public at that stage. Furthermore, detailed RIAs, in line with the principles of better regulation, will be conducted as part of bringing forward any specific proposals for trading schemes using the enabling powers in this draft Bill, or any other policy measures intended to reduce emissions.

3. Consultation

3.1 Please see www.defra.gov.uk/corporate/consult/climatechange-bill for a full list of consultees.

4. Outline of Mitigation Benefits, Costs and Uncertainties

4.0.1 This section contains a high level discussion of the:

- illustrative benefits and costs of action to deliver the proposed statutory emissions reduction targets of 60%, through domestic and international effort, by 2050 and 26-32% by 2020 (compared to 1990 levels);
- key uncertainties and sensitivities surrounding these assessments; and,
- potential distributional impacts across different sectors of the UK.

4.0.2 However, as outlined in the introduction, the draft Bill does not provide for either the precise trajectory or the policy mix towards achieving these targets. As such, further detailed impact assessments will be conducted when budgets are set and individual policies are put in place.

4.1 Benefits of UK action to reduce climate change

4.1.1 This section outlines the benefits of proposals contained within the draft Bill, focussing in particular on the potential impact of a domestic carbon management framework based on a system of carbon budgets and statutory targets (discussed in more detail in Section 5.1). This is designed to:

- facilitate delivery of the optimal emissions reduction trajectory which minimises the costs and potential adverse impacts of abating towards any given target level;
- provide greater clarity and certainty for UK industry to plan effectively for, and invest in, a low-carbon economy;
- strengthen the framework for strategic management of policy; and,
- maximise the UK's leadership internationally to help raise the ambition and urgency of collective action.

4.1.2 It is important to note that a key element of the draft Climate Change Bill is to place a duty on the Government to regularly report on the risks of the impacts of climate change for the UK, and on its proposals and policies for adapting to climate change. This will provide a framework for making clear the actions to tackle the now unavoidable effects of climate change, providing further certainty. A quantitative analysis of the associated benefits of adaptation is not provided here, as the duty relates to the reporting of measures rather than their implementation. It is envisaged that significant adaptation measures would themselves be accompanied by impact assessments before implementation.

4.1.3 As outlined in Section 2.2 (and in the consultation document), unabated climate change presents unacceptable environmental risks: 'business as usual' assessments of future global GHG emissions mean it is likely that atmospheric concentrations will reach levels where human society risks potentially catastrophic environmental consequences. The Stern Review, based on the latest science of environmental risk, highlighted the need to abate urgently in order to stabilise atmospheric GHG concentrations and avoid the most dangerous impacts of climate change. In addition, it indicated the desirability of action to mitigate climate change around these levels, as the costs of

coordinated global action to stabilise atmospheric concentration at 550 ppm CO_2e substantially outweighed the costs of inaction.

Establishing a framework to minimise abatement costs

4.1.4 The proposed carbon management framework, based on a system of statutory targets and five year carbon budgets supported by independent analysis and advice from a new Non-Departmental Public Body (see Section 5 for details), is intended to minimise the cost of mitigation, in particular by facilitating:

- the optimal emissions reductions trajectory towards the statutory targets; and,
- the desirable balance of domestic emissions reductions versus financed emissions reductions overseas.

4.1.5 As outlined later in Section 4.3, the timing and pathway of emissions reductions towards the overall target is likely to impact on costs. It is anticipated that, informed by detailed, specialist advice from a newly create Committee on Climate Change, the carbon budgets would be set consistent with the expected least cost trajectory towards the statutory targets. Detailed decisions to ensure flexibility to be able to respond to adverse or unexpected circumstances are discussed in Section 5.

4.1.6 In addition, the proposed framework is intended to deliver the optimal balance of domestic emissions reductions versus financed emissions reductions overseas (sometimes referred to as traded 'effort'). As a global externality, the location of emissions reductions does not change their environmental value. However, it may be cheaper to abate in less developed countries which often utilise relatively less efficient capital stock.

4.1.7 Flexibility to choose where to invest to reduce GHG emissions is a key pillar of existing multilateral frameworks:

- the Kyoto Protocol establishes a system of tradable emissions reductions credits, such as Clean Development Mechanism (CDM) and Joint Implementation (JI) mechanisms, which allow "Annex 1" countries (i.e. countries with direct emissions reductions obligations) to invest in mitigation projects in developing countries in order to meet their own GHG reduction targets. However, the Kyoto Protocol also supports the "principle of supplementarity", which asserts that "Annex I" countries should use the project mechanisms in a way which is supplemental to domestic emissions reductions (although this is not quantified, in relation to our international targets under this agreement); and,
- the EU-ETS determines that any emissions reductions resulting from the purchase of an emissions allocation ('effort') overseas by a UK installation counts towards our domestic targets. This decision is typically determined by whether it is cheaper to abate directly or buy credits in the event of scarcity at firm level.

4.1.8 Under the proposed framework, the Committee on Climate Change would advise on the appropriate balance of domestic emissions reductions versus financed emissions reductions overseas (following guidance from Government

surrounding its interpretation of the "principle of supplementarity"). In providing this advice, it would need to consider:

- the marginal and dynamic costs of domestic abatement in sectors outside the EU-ETS in relation the expected international carbon price. This would need to factor in assessments of potential ancillary effects, such as improved public health, increased energy security, and reduced fuel poverty, which are likely to reduce the cost of domestic mitigation policies (see Annex A for background); and,
- the potential impact of purchasing emissions reductions overseas on the capacity of the UK to demonstrate international leadership (resulting in slower transformation in the carbon intensity of domestic markets).

Detailed decisions in relation to the development of the proposed carbon management framework, designed to facilitate this optimal balance of domestic emissions reduction versus UK financed 'effort' overseas, are outlined under Issue 3 of Section 5.2.

4.1.9 The overall costs of mitigation could be further minimised through the implementation of policies based on the three-pronged approach identified by the Stern Review (and building on existing policies), in particular the:

i) Establishment of a carbon price: consumers and producers must bear the full cost of consumption or production decisions, including the external costs of climate change from emissions of CO_2 or other GHGs, in order that markets encourage socially optimal economic behaviour. It is desirable that this price should apply universally as well as be credible, flexible and be subject to a degree of certainty over time. Credible, certain policy frameworks are necessary to drive sufficient investment, essential for transition to a low-carbon economy. However, the underlying uncertainties that are inherent in understanding the problem of climate change means that any framework also needs to be flexible to allow decision makers to make adjustments in light of new information or unexpected events.

ii) Promotion of innovation in low-carbon technologies: technological developments are needed to increase cost effective mitigation potential in the long run. Uncertainties and costs surrounding the development and deployment of the technologies to address it (as well as the environmental risks associated with ineffective mitigation) are substantial. This points to the need for close cooperation between governments and industry to support the development and diffusion of a portfolio of low-carbon technology options.

iii) Overcoming market barriers and failures: which restrict the transmission of incentives in markets affecting energy demand is needed to increase cost effective mitigation potential in the short and medium run, particularly in relation to uncovering greater energy efficiency savings. These include: hidden and transaction costs; lack of information about available options; capital constraints; misaligned incentives; as well as behavioural and organisational factors affecting economic rationality in decision-making.

Creating greater certainty for investors

4.1.10 Policy instruments such as taxation, trading schemes or regulation establish a value for future emissions reductions. This incentivises investment in less carbon intensive capital as well as innovation in the development of longer term technological and behavioural solutions. However, these incentives are weakened where households and firms perceive risks surrounding the existence of a carbon price (these are in addition to those inherent to many investment markets). In such cases, Governments are largely responsible for uncertainty surrounding the market benefits of mitigation.

4.1.11 Uncertainty is likely to increase the level of profitability required by households and particularly firms when making investment decisions, resulting in the risk of inefficiently high levels of carbon intensive capital.[6] This is an especially important factor in markets which are currently investing heavily in long lived capital, such as electricity generation and buildings, where there is the potential for extended 'lock in' to high carbon technologies, for example coal fired generation stock or energy inefficient housing. This may result in the need to undertake potentially expensive early capital retirement programmes or abate more aggressively in other sectors at higher cost in the future.

4.1.12 Currently, there is significant uncertainty surrounding the degree of climate change mitigation that will be undertaken. This is, in part, because no international agreement yet exists beyond 2012 (as a successor to Kyoto). Uncertainty is also generated because there is, as yet, no defined commitment for Phase III of the EU-ETS (and beyond). Whilst the principal doubt relates to the existence of a carbon price, greater certainty over the degree of ambition, with clear implications for policy commitment, therefore has implications the implied scale of returns to investment.

4.1.13 The draft Bill proposes to enshrine domestic commitments in statute. This would reduce uncertainty surrounding the intention of Government to institute domestic policies to realise these goals. As such, it would increase **certainty** for UK households and particularly firms investing in the UK. However, it is essential that these commitments are reinforced by the implementation of credible policies, which clearly demonstrate capacity to deliver these objectives. As such, policies as part of the forthcoming 2007 Energy White Paper are an important part of this matrix.

4.1.14 However, in sectors covered by EU-ETS, the UK alone cannot determine the exact rewards from climate change abatement and the development of cleaner technologies. This is because the value of emissions reductions is determined by the degree of constraint across the EU as a whole. Nevertheless, such a domestic commitment would have an effect on the Government's efforts to promote EU cooperation to establish further, deeper EU-ETS commitment

[6] Blyth, W., and M. Yang (2006): 'The effect of price controls on investment incentives', presentation to the Sixth Annual Workshop on Greenhouse Gas Emission Trading, Paris: IEA/IETA /EPRI, September 2006, available from http://www.iea.org/Textbase/work/2006/ghget/Blyth.pdf.; Blyth, W. and M. Yang (forthcoming), 'Impact of climate change policy uncertainty on power generation investments', Paris: IEA.

periods (for example under a Phase III), and for the scale of any future national allocations it was prepared to accept.[7]

4.1.15 Furthermore, setting emission reduction targets for the whole economy in statute gives firms in the UK the added certainty that, should the EU-ETS cease to exist in the future, the UK Government would need to establish new policies to ensure the ongoing existence of rewards for emissions abatement and the development of cleaner technologies in sectors formerly covered by the scheme. In short the draft Bill should help provide improved certainty as to the long run existence of a carbon price, but there are limitations to its capacity to confer certainty, particularly as to precise value of emissions reductions.

Promoting conditions for international cooperation through domestic leadership

4.1.16 Climate change is an international collective action problem which requires cooperation in order to minimise both environmental risk and mitigation costs. However, cooperation is affected by market failures which lead to the under-provision of public goods[8] where individuals or countries face an incentive to free-ride on the actions of others.[9] This leads to the risk that countries will try and avoid reducing emissions (and incurring associated costs), while benefiting from mitigation commitments of others.

4.1.17 Game theory can provide useful lessons and insights. For example, the Prisoner's Dilemma game illustrates that countries have the incentive to free ride on the abatement of others, with the result being that everybody is worse off than if they had cooperated. However, analysis of this game also suggests it is possible to sustain cooperation if the game is repeated, for example where a series of commitment phases are required to stabilise atmospheric GHG concentrations.

4.1.18 However, there are likely to be a number of possible 'equilibria', in any game (or agreements on degrees of commitment to reduce emissions).[10] The precise outcome may be influenced by the approaches to climate change that countries *expect* others to adopt. By placing domestic commitments in statute, the UK Government is signalling its intention to seek a low GHG concentration equilibrium and not to free ride on any commitments of other countries. This may help influence overall global outcomes, particularly if the strategy is replicated by others, for example across the wider EU.

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[7] Although recognising that allocations under the EU-ETS scheme could become based on 'auctioning' to a greater degree in the future.

[8] A public good is a good that is non-rival where the consumption of such a good by one individual does not reduce the amount of the good available for consumption by others. The term public good is often used to refer to goods that are non-excludable as well as non-rival. This means it is not possible to exclude individuals from the good's consumption.

[9] Wicksell K. (1896) identified the problem of free-riding. He showed that the voluntary provision of public goods would lead to undersupply, because all actors hope that others will bear the cost of provision, so do not contribute.

[10] Nash, J.F., Equilibrium Points in N-person Games, *Proceedings of the National Academy of Sciences* 36 (1950), 48–49.

4.1.19 Stabilising atmospheric GHG concentrations is likely to require cooperation across multiple commitment phases. There is evidence that countries are starting to adopt strategies of conditional co-operation, in which they contribute more to the provision of a public good the more others contribute: for example, at the Spring European Council on 8/9 March 2007, EU Heads of Government agreed an ambitious, independent binding target to reduce Europe's greenhouse gas emissions by at least 20% by 2020 (compared to 1990 levels) and increase this commitment to a 30% reduction as part of an international agreement. The UK can help build consensus within the EU, and to a lesser extent internationally, aimed at creating a critical mass towards such deeper cooperation.

4.1.20 Leadership must come from developed countries because they have been responsible for the majority of the historic rise in GHG concentrations, generally have higher per capita emissions, as well as the income levels and technological capacity to lead the necessary investment. The Stern Review suggested that developed countries should take responsibility for GHG emissions reductions of between 60 and 80% from 1990 levels by 2050. Without such commitment from developed countries, securing a future multilateral global framework will be impossible.

4.1.21 The UK, along with other developed countries, therefore has an important responsibility to build consensus towards strong international collective action. This legislation is part of that endeavour. The UK has been at the forefront of diplomatic solutions, policy development as well as in research to combat the threat of climate change, in particular by:

- putting climate change on top of its agenda for the dual presidencies of the Group of Eight (G8) and the EU in 2005 (resulting in the establishment of the Gleneagles Dialogue on Climate Change and Sustainable Development);
- working with the World Bank and the multilateral development banks to drive investment in low-carbon energy sources, energy efficiency and adaptation to climate change in developing countries;
- promoting cooperation on technology transfer, for example as part of strategic 'Dialogues' with India and China;
- accepting relatively high burden sharing agreements under the Kyoto Protocol commitments as well as in Phase I and Phase II national allocation agreements under the EU-ETS;
- encouraging development of wider EU policies to tackle GHG emissions including through regulation of certain fluorinated gases, and a suite of energy efficiency performance standards; and,
- developing our collective understanding of the costs and risks by sponsoring research into both mitigation and adaptation, for example by the recent Stern Review.

4.1.22 By making clear up-front legal commitments for the UK to take responsibility for reducing a fair share of global emissions in a way that is consistent with continuing economic and social prosperity, it would be reinforcing this leadership with a view to creating the conditions in which commitments are more likely to be mutually reinforcing. The UK Government will pursue this objective through engagement with trading partners within the EU and

internationally, building on a range of existing approaches (including those outlined above).

4.1.23 **Overall, analysis suggests that there is a strong case surrounding the potential for the proposed framework to help minimise the costs of abatement to the UK by facilitating the delivery of the optimal emissions reduction trajectory and balance of domestic mitigation versus UK emissions reductions overseas. In addition, domestic statutory commitments are likely to provide greater clarity and certainty for UK industry to plan effectively for, and invest, in a low-carbon economy and maximise the UK's leadership internationally to help foster the conditions for broader and deeper international cooperation, particularly through the EU (which could reduce the costs of mitigation significantly).**

4.2 Outlining the costs of UK action to reduce climate change

4.2.1 This section outlines the:

- indicative long run costs of implementing the proposed statutory target to reduce CO_2 emissions by 60% in 2050 (compared to 1990 levels);
- indicative transition costs associated with an interim emissions reductions targets within the range of 26% and 32% by 2020;
- key uncertainties surrounding these cost projections together with the underlying sensitivities (in order to inform decisions surrounding the design of the policy framework); and,
- likely distribution of long run and transition costs and the way in which the choice of policy mix might influence this.

4.2.2 However, it is important to note again that the draft Bill does not provide for either the precise trajectory or the policy mix towards achieving these targets, rather it creates a framework for managing the transition to a low-carbon economy. The overall economy wide and distributed impacts are likely to be influenced by detailed decisions regarding the size of overall carbon budgets and the balance of policies to deliver them. These will be the subject of further and more detailed impact assessments, which will be produced before carbon budgets are set, and when designing individual policy measures to deliver emissions reductions.

4.2.3 This section draws on a range of different modelling results applicable to both the UK economy and, in some circumstances, drawing on analogous mitigation cost studies in other developed countries. This includes research undertaken as part of the Stern Review, together with analysis conducted for, and due to be published alongside, the forthcoming Energy White Paper (in particular, a newly developed Macro MARKAL model which focuses on long run mitigation costs of meeting the 2050 target, as well as a study conducted by Oxford Economics to explore the potential short run adjustment costs of meeting the 2020 target).

Box 1: Using Modelling to Estimate Costs

Technology 'bottom up' models, such as the UK MARKAL and MARKAL MACRO (MM) models are useful in understanding long run costs of climate change mitigation. They are based on highly detailed assumptions regarding the potential costs of future technologies.

- The UK MARKAL model is a dynamic energy optimisation model that minimises the total cost of the energy system over a 50 year plus horizon. It provides valuable insights into the technical options and costs of carbon abatement between now and 2050. It has been substantially updated since 2003 with more detailed information and revised assumptions on technology costs and processes as part of a joint DTI/DEFRA sponsored project with the UK Energy Research Centre (UKERC) and Policy Studies Institute (PSI).[11]
- This project also developed the MM model, which links the detailed characterisation of the standard UK MARKAL, with a 'top down' macroeconomic component. This model allows households and firms to reduce their demand for energy in response to higher prices (a response not available in the 2003 iteration). It also facilitates the explicit calculation of the macroeconomic variables such as GDP impacts, which was calculated 'off model' in the 2003 study.

The MARKAL and MM model are particularly useful in exploring the energy system in the long-term, and may be expected to produce lower-bound estimates of the costs of carbon abatement in 2050. As a UK only model, the MM model cannot capture trade and competitiveness impacts. In addition, the model describes the economy in equilibrium, and therefore is unable to capture transition costs that might occur as the economy adjusts to changes in energy policy. It is also somewhat limited in its ability to capture the obstacles that, in reality, can slow uptake of cost effective abatement or which make it more expensive, such as information barriers and policy costs.

Macroeconomic models, whose focus is on the short-run dynamics, are better suited to capturing these transitional costs as well as competitiveness effects associated with any policy change. As such, analysis undertaken as part of the forthcoming Energy White Paper 2007 using a suite of models developed by consultants Oxford Economics, explore the potential short-run adjustment costs associated with moving to a low-carbon economy up to 2020. However, insofar as macroeconomic models such as the UKEIM do not have the technological detail of 'bottom up' models such as the MARKAL; they have the potential to overestimate the potential GDP impacts by overlooking the potential for cost-effective abatement.[12]

When considering the results of such macroeconomic models, it is desirable to compare those which include induced technological change with those where this factor is exogenous. In the case of the former, mitigation commitment frameworks which establish a value to GHG reductions as well as incentives to increase Government or private sector expenditure on research and development impact on the speed of technological development and resulting abatement costs. The latter class of models, which do not account for these factors, tend to produce relatively higher cost assessments. A study commissioned by the Stern Review found that the inclusion of induced technical change could lower the estimated costs of stabilisation by one or two percentage points of global GDP by 2030.[13]

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[11] More detailed papers on the development of the MARKAL and MARKAL-MACRO model available from the UKERC website http://www.ukerc.ac.uk/content/view/142/112/

[12] Results discussed here are preliminary. The full report by Oxford Economics will be published alongside the Energy White Paper later this year.

[13] Barker T. *et al.,* A report prepared for the HM Treasury Stern Review on "The economics of climate change" The Costs of Greenhouse Gas Mitigation with Induced Technological Change: A Meta-Analysis of Estimates in the Literature http://www.hm-treasury.gov.uk/media/8A7/01/ster_review_supporting_technical_material_terry_barker_231006.pdf

4.2.4 Technical issues surrounding the use of these and wider generic approaches to modelling mitigation costs are outlined in Box 1 below. It is important to emphasise that projections based on models are inherently uncertain, especially over the long term. Therefore, the modelling results cited in this report (some of which are preliminary) are only intended to illustrate possible costs rather than predict precise outcomes. As such, any results must be carefully interpreted when designing policy and the inherent degree of uncertainty surrounding these has implications for the desirable level of flexibility within the overall framework (discussed in Section 5).

Illustrating long run cost impacts up to 2050

4.2.5 The Stern Review concluded that, based on an extensive review of the current literature, the long run costs of global action to stabilise atmospheric GHG concentrations at 550ppm CO_2e are expected to be around 1% of GDP by 2050, within a range of +/-3%. Co-ordinated multilateral action, with good policy design and flexibility over where, when and what emissions are reduced are essential to keep costs this low. This range is substantially lower than the expected costs of 'do nothing' to reduce climate change, estimated at between 5% and 20% of global GDP now and forever.[14]

4.2.6 As part of the 2003 Energy White Paper, the Government used the 'bottom up' UK MARKAL model to estimate long run mitigation costs. It concluded that, based on a wide range of sensitivity analyses, the expected costs of reducing carbon emissions by 60% by 2050 were approximately equal to between a 0.5% and 2% permanent reduction in GDP in 2050.[15] Since 2003, this model has been substantially updated, and supplemented by the development of a new MARKAL-MACRO model which facilitates the explicit calculation of the macroeconomic variables such as GDP impacts (see Box 1 for details on both models). The new MARKAL-MACRO is expected to produce lower estimated abatement costs than the updated standard MARKAL (or the version of the model used in 2003).

4.2.7 Preliminary MARKAL-MACRO modelling analysis undertaken as part of the context of the forthcoming 2007 Energy White Paper indicates that the long run costs of reducing carbon emissions by 60% by 2050 are around 0.7% of GDP by 2050 in the central fossil fuel price scenario, falling to 0.3% of GDP by 2050 in the high fossil fuel price scenario. As in the analysis for the 2003 Energy White Paper, the cost and availability of low-carbon technologies is important in keeping costs low: the new MARKAL MACRO analysis suggests that costs could be up to 1.5% of GDP in 2050 if innovation is restricted[16]. This is within the range of global costs indicated by Stern, but lower than the 2003 analysis. Two important factors affecting this are the potential for the model to capture

[14] The cost assessments outlined by the Stern Review are expressed in terms of a balance growth equivalent. This measures the welfare of action or inaction in response to climate change arising from an impact on consumption over time, in terms of the amount consumption today which would deliver the same amount of utility. As such, this is a slightly different measure from the GDP indicator used in relation to the UK long run and transition cost modelling.

[15] In the 2003 analysis, GDP impacts were estimated 'off model' and are not directly comparable with the MARKAL-MACRO estimates (see Box 1),

[16] In this scenario, post 2010 'vintages' of efficient end-use technologies and measures, as well as power sector and other upstream technologies, are restricted from the model.

reduction in the demand for energy services (in response to energy price increases), as well the impact of higher fossil fuel price forecasts (compared to those forecast in 2003).

4.2.8 **Preliminary analysis for the UK, undertaken as part of the forthcoming 2007 Energy White Paper, indicates that the long run costs of achieving significant reductions in CO_2 emissions are within the range identified by the Stern Review (which estimated that the long run costs of global action to stabilise atmospheric GHG concentrations at 550ppm CO_2e are likely to be around 1% of GDP by 2050, within a range of +/- 3%). International emissions trading will be an important factor in keeping costs to a minimum. However, there are substantial uncertainties surrounding assessments of the precise costs which are outlined in Section 4.3.**

Illustrating transition costs in the short and medium term

4.2.9 Transforming the carbon intensity of all key markets affecting energy demand, such as electricity, heat, and transport, requires investment in new capital and processes as well as ongoing long run technological development. However, in addition to the long run costs illustrated in the previous section, it is likely that there will be short and medium run costs, in terms of reduced consumption, output and employment, for example:

- carbon intensive sectors of the economy are likely to contract from the imposition of more rigorous carbon constraints (although others may benefit); this may result, for example, in some structural adjustment in employment patterns;
- households and firms may need to replace capital prematurely in response to new financial incentives to conserve energy or switch fuels, increasing production and consumption costs; and
- households and firms may incur additional transaction costs associated with shifting patterns of production and consumption, for example arising from the need to acquire information or develop skills in relation to new technologies, or potentially interrupt production.

4.2.10 As outlined in Box 1, macroeconomic models which focus on the short-run dynamics, are better suited to capturing these transitional costs than 'bottom up' models referred to in the previous section.

4.2.11 Macroeconomic analysis conducted by Oxford Economics, as part of the forthcoming Energy White Paper, is helpful in illustrating the potential short-run adjustment costs associated with moving to a low carbon economy up to 2020. In particular, it considers the potential economic costs of the introduction of a *purely illustrative* carbon price on all sectors sufficient to achieve constant annual reductions (i.e. a 'straight line' trajectory) towards an overall carbon emissions reduction of 30% by 2020 (based on 1990 levels). This analysis incorporates in the baseline the continuation of the EU-ETS post 2012, contributing to a 17% reduction in emissions (from 1990 levels). Preliminary results from this analysis suggest that the transition costs could be between 1.3

to 2% of GDP in 2020.[17] This is equivalent to a 0.7% to 0.9% reduction in cumulative GDP over the period.[18]

4.2.12 Any assessment of the UK transition costs needs to be put in the context of a wider (though limited) pool of analysis that focuses on the dynamic costs of mitigation policy in the UK and in other developed countries. Much of the analysis on transition costs has focussed on the attempts of developed countries to meet their Kyoto protocol targets. Based on a review of a wide range of studies, the IPCC concluded in its Third Assessment Report (2001) that the cost of implementing Kyoto in 2010 for Annex I countries was in the range 0.2 to 2% of GDP without the use of the flexible mechanisms (trading between Annex B countries[19]) and 0.1 to 1.1% of GDP with these mechanisms in place. However, these figures may be overestimates, as they don't allow for cost effective reductions in methane, nitrous oxide and fluorinated gases.

4.2.13 US studies of transition costs have tended to suggest that transition costs could be more substantial. One study of US Kyoto compliance costs indicated transition costs of as much as 3.4% by 2010 and 0.2% in 2020.[20] However, it is likely that these are over-estimates due to the fact that the analysis modelled technological exogenously, used high emissions baselines and assumed of limited policy flexibility (not reflected in the Kyoto framework). Nordhaus famously estimated that the US would face a cost of meeting Kyoto which was more than the global total for the Annex I countries. His estimates suggest that the US would face discounted costs of $325 billion while the rest of the world has a net benefit from Kyoto of $108 billion. In these estimates European OCED countries face relatively small abatement costs. This high cost of the Kyoto Protocol to the US arose because CO_2 emissions were projected to grow much more rapidly in the US than in other regions, so containing emissions would prove much more expensive.

4.2.14 However, these short term costs will depend on a number of factors, including the absolute level of 'effort' required to achieve a target, the relative effort compared to other countries and regions, fossil fuel prices and the level of technological change and speed of adjustment to higher prices. The potential importance of these factors is discussed in the next section.

4.2.15 **Short and medium run (i.e. to 2020) transition costs could be in the upper end of the range indicated by the Stern Review although these are highly dependent on the choice of transition path as well as policy mix. However, there are substantial uncertainties surrounding assessments of the precise costs which are outlined in the next section.**

[17] These costs show that GDP in 2020 would be 1.3% to 2% lower that under the baseline.
[18]. Cumulative measure discounts future expected GDP reductions by 3.5% in line with HM Treasury Green Book.
[19] The group of countries included in Annex B of the Kyoto Protocol that have agreed to a target for their greenhouse gas emissions.
[20] Energy Information Administration (1998)

4.3 Outlining the Key Uncertainties and Sensitivities

4.3.1 This section outlines analysis surrounding the sensitivity of the cost assessments outlined in the previous section, to a number of key uncertainties including the:

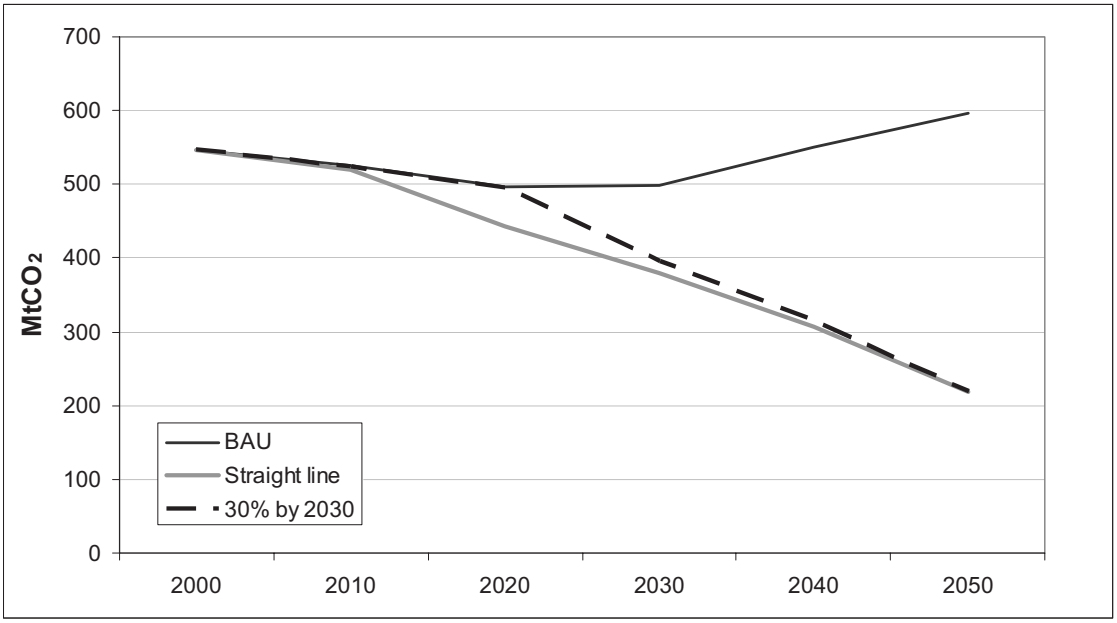
- choice of emissions reductions pathway;
- degree of international commitment to reduce GHG emissions including the relative effort between countries and regions;
- cost and availability of low-carbon or energy efficient technologies; and,
- cost of fossil fuels.

This is intended to inform more detailed decisions surrounding the development of the proposed carbon management framework.

Pathways to transition

4.3.2 The timing and pathway of emissions reductions towards an overall objective is likely to impact on costs. Preliminary results from the newly developed MARKAL-MACRO model compare the long run costs of two different pathways to achieving a 60% reduction by 2050. In particular, a 'straight line' trajectory from 2010; and one where the model achieves 30% reductions (based on 1990 levels) by 2030,[21] and thereafter falling linearly to 2050. These different pathways are shown in the Figure 1.

Figure 1 Comparing Pathways to 60% emissions reduction by 2050



4.3.3 Preliminary results suggest that following a tougher 'straight line' abatement profile could result in higher marginal and total costs in the short and medium term (i.e. up to 2030). However, the analysis suggests that if action to reduce

[21] These constraints are applied in the attempt to replicate realistic options for abatement. Without any intermediate constraints the model might choose a path where all efforts are made towards the end of the period, which would, however, imply an unrealistic pattern of asset replacement and might also create some computational problems in the model.

carbon emissions is delayed then marginal costs in the longer run are expected to be higher. Furthermore, delaying action implies that less carbon is abated on a cumulative measure.

4.3.4 The forthcoming analysis using the Oxford Economics model indicates a relatively high sensitivity of short and medium run adjustment costs to the choice of two different, *purely illustrative*, pathways to an overall CO_2 emissions reduction of 30% by 2020 (based on 1990 levels). It indicated that the total cumulative GDP costs over the period 2007-2020 were over double (around 1.6% GDP) in the case of a 'big bang' scenario, in which a large immediate carbon price is imposed on all sectors, compared to the case of a smoothed introduction of carbon price (around 0.8% GDP), designed to achieve a 'straight line' emissions reduction trajectory.

Degree of international effort

4.3.5 The proposals within the draft Bill set unilateral targets placed in statute for the UK to take responsibility for a fair share of the global mitigation effort. However, it is likely that the resulting transition costs will be affected by the degree of wider international commitment as this may affect, for example, the size of markets for individual low-carbon technologies as well as the wider macroeconomic conditions affecting the UK. However, there remains some uncertainty surrounding the exact nature of the impact of differing degrees of multilateralism on mitigation costs.

4.3.6 Recent work for the Australian government[22] showed relatively low impacts of differing degrees of international commitment on domestic mitigation costs. However, research by the IPCC found relatively high risks of asymmetric mitigation action resulting in the transfer of productive capital to countries without carbon policies, known as 'carbon leakage'.[23] However, it is likely that different approaches to modelling technological change account for some of these differences (outlined in Box 1).

4.3.7 Analysis conducted as part of the forthcoming 2007 Energy White Paper looked at the macroeconomic impacts in the UK of different degrees of EU and international effort by 2020. Preliminary results suggest that short run costs to the UK could be slightly magnified in the event of more symmetric European and international action, due to the initial negative impacts of foreign efforts on external demand for UK exports. However, in the medium run (i.e. by 2020) costs to the UK might be lower, due to smaller competitiveness effects.

[22] Energy Futures forum http://www.csiro.au/files/files/pbd1.pdf

[23] IPPC (2001) Third Assessment Report, using Computational General Equilibrium models with exogenous technological change, estimated leakage rates for first period Kyoto through uniform carbon taxes of between 5-20%. Babiker (2005) produced much higher leakage estimates ranging from 25 to over 100%; implying significant losses of competitiveness for OECD countries using a global general equilibrium model.

Cost and availability of low-carbon or energy efficient technologies

4.3.8 Mitigation costs for a given emissions reduction trajectory are likely to be heavily influenced by the availability and costs of key abatement technologies. Furthermore, the speed of technological development is itself likely to be influenced by the decisions of policy makers regarding the overall commitment framework (which establishes a value to GHG reductions as well as incentivising Government or private sector expenditure on research and development). A study commissioned by the Stern Review found that the inclusion of induced technological change within modelling exercises could lower the estimated costs of stabilisation by one or two percentage points of GDP by 2030.[24]

4.3.9 Preliminary results from the analysis using the Oxford Model suggest that induced technological change can affect the magnitude of costs in the short-term. For example, sensitivity analysis in which technological change was assumed to be relatively fast in response to carbon prices, suggested that total GDP costs by 2020 might be reduced by 13%. Conversely, GDP costs in 2020 were around 7% higher in 2020, when expected technological inducement was assumed to be relatively slower.[25]

4.3.10 Analysis for the forthcoming Energy White Paper also looked at the sensitivity of costs in the long term to the level of innovation and availability of low-carbon technologies, including both end-use and generation technologies. Preliminary results from the MARKAL-MACRO model suggests that the long term (to 2050) GDP costs could be roughly double in the scenario in which innovation in technology was restricted beyond 2010, i.e. 1.5% compared with 0.7% in the central case[26]

The cost of fossil fuels

4.3.11 The long run levels as well as short term fluctuations in fossil fuel prices are key uncertainties affecting energy markets. In general relatively low fossil fuel prices increase abatement costs as low-carbon alternatives become relatively more expensive, and as demand for energy increases in response to low price; although in the electricity generation sector, the relative prices between the fossil fuels is an important factor. Preliminary analysis conducted as part of the forthcoming 2007 Energy White Paper indicates that:

- long run mitigation GDP costs of achieving a 60% reduction in emissions in 2050 are cut by more than a half in the case of high fuel price scenarios, i.e. from 0.7% reduction in GDP by 2050 in the central case to a 0.3% reduction in the case of high prices;[27] and

[24] Barker T. *et al*. (2006)

[25] This is based on the introduction of a *purely illustrative* carbon price sufficient to achieve constant annual reductions, i.e. a 'straight line' trajectory, towards an overall carbon emissions reduction of 30% by 2020 (based on 1990 levels), and assumes baseline emissions reductions of 17%.

[26] The restricted innovation scenario, fewer efficient end-use technologies are available, and learning improvements in technologies are not allowed post 2010.

[27] Analysis using MARKAL MACRO. Conversely, however, the low fuel price scenario is the same cost as central, 0.7% GDP in 2050. This is because, although all fuels are cheaper, the relative price change makes gas more competitive than coal resulting in lower emissions than in the central in the base.

- short and medium run transition GDP costs in 2020 of achieving 30% emissions reductions could increase (up to 2% of GDP by 2020) under low fossil fuel prices but fall to 1.3% in the event of high fuel prices.[28]

Uncertainty and policy design

4.3.12 **The analysis presented in this section indicates that mitigation costs are highly sensitive to the choice of emissions reduction pathway as well as assumptions regarding technology costs and, in addition, are moderately sensitive to those regarding fuel prices. However, the underlying sensitivity of mitigation costs to differing degrees of mitigation by other countries is less well understood.**

4.3.13 **The extent of these sensitivities implies the desirability of a flexible policy framework which actively assesses, manages and, where necessary, reviews the optimal pathway and delivery of transition to a low-carbon economy in light of a wide range of factors** including: the degree of international commitment to reduce GHG emissions; the cost and availability of low-carbon or energy efficient technologies; and the cost of fossil fuels. Detailed policy design issues are set out and discussed in Section 5 in the light of these uncertainties.

4.4 Estimating Distributional Effects

4.4.1 The impacts of climate change mitigation policies are likely to be unevenly distributed across sectors and households. The distributional impacts will be affected by the extent to which the UK acts unilaterally and by the particular policy mechanisms used in each sector. As mitigating climate change is a relatively new objective for Government, there are not, as yet, any substantial *ex-post* (i.e. retrospective) econometric analyses that illustrate the distributional and employment effects induced by mitigation policies. As such, much analysis of these potential effects is based on theoretical reasoning and simulation studies which must be interpreted cautiously. This section discusses the possible distributional impacts of achieving the headline targets proposed in the draft Bill.

Energy intensive industries

4.4.2 The Stern Review suggests that industrial sectors which have high energy-intensities of production and that are highly exposed to international competition are likely to experience the most adverse impacts on output and employment . The Stern Review analysed the potential effects of implementing a carbon price of £70/tC on the UK economy using input output tables.[29] It found that energy intensive sectors are the most likely to be adversely affected by mitigation policies. However, it also found that only 6 of the 123 UK sectors were projected

[28] Evaluated on the basis of a 'straight line' trajectory towards an overall carbon emissions reduction of 30% by 2020 (incorporating the continuation of the EU-ETS post 2012 in the baseline, contributing to a 17% reduction in emissions from 1990 levels).
[29] Stern Review, Chapter 11.

to face an increase in variable costs of 5% from higher energy costs as a result of carbon pricing. These are: gas supply and distribution; electricity production and distribution; refined petroleum; cement; fertilisers; and fishing. This is because many sectors tend to trade mostly inside the EU. For example, trade intensity falls seven-fold in the cement industry when restricted to non-EU countries and four-fold in pulp and paper, plastics and fibres. As such, mitigation through the EU-ETS (and other policies such as EU wide regulation) which establish a single carbon price across the trading block, have the potential substantially to reduce competition risks.

4.4.3 Overall, preliminary results from research undertaken as part of the forthcoming 2007 Energy White Paper suggests that the imposition of carbon constraints may cause some structural adjustment in the economy, with output and employment re-allocated from energy intensive to non-energy intensive sectors. The analysis suggests that working cooperatively, and especially through the EU-ETS, minimises the effects on those sectors exposed to international competition. Further analysis, considering the impact under a scenario where a carbon price is imposed more symmetrically across the EU, which better reflects the UK's current mitigation strategy which places primacy on the EU-ETS for these sectors, is likely to show reduced structural effects and competitiveness risks.

Non-energy intensive sectors

4.4.4 Climate change mitigation policies may have some impact on less energy intensive areas of the economy, predominantly those in the service sector. However, the extent of this impact is likely to be limited by the fact that these sectors typically have a very low ratio of energy costs to output - often less than 2% (compared to typical labour costs in the region of 26%).[30] As such, a marginal increase in energy prices as a result of the introduction of a carbon price is unlikely to have a substantial impact on overall production costs, especially when considered in the context of natural fluctuations in the fuel markets (see next section on energy prices and consumers). Any cost increases could be partially offset by inducements to innovate and use energy more efficiently (see section in on encouraging innovation and resource efficiency).

4.4.5 Some sectors of the UK may be well placed to benefit from its early action, such as environmental consultancy services. As a major provider of financial services, it is likely that the UK, and particularly London, will benefit from growth in an international carbon market: city industrial and financial experts have quickly developed expertise in forecasting and hedging carbon prices and developing futures markets which support the operations of the EU-ETS. A recent World Bank / IETA report on the growth rate in the market for JI and CDM credits quadrupled last year and UK companies increased their share from 12% to 15% of this market.[31]

4.4.6 DTI analysis however also suggests several sectors where the UK has a reasonable to good probability of success in global markets including: Air Pollution Control, Environmental Monitoring and Instrumentation, and Environmental Consultancy Services. Other possible areas of commercial

[30] 2005 estimate in Annual Business Inquiry (see http://www.statistics.gov.uk/abi/)
[31] State of the carbon market report, 2006

success could include; Cleaner Technologies and Processes, Renewable Energy, Waste Management and Energy Management.

Consumers and energy prices

4.4.7 Carbon abatement can be costly and can increase energy prices. The existence of the EU-ETS is, for example, having an impact on electricity prices in the UK because electricity generators can pass on the cost of carbon allowances. The size of this impact depends on the scale of effort to deliver carbon savings across the EU and the degree of pass-through of the carbon price.

4.4.8 The Stern Review Input-Output analysis reveals that a £70/tC ($30/tCO$_2$) carbon resource cost is likely to have a similar impact as an $11/bl real oil price increase at 2003 prices (assuming a proportionate gas price increase). However, to put this in context, the sterling oil price has increased by 150% in real terms since 2003 (average), when the price of Brent crude hovered at around $26 a barrel for most of that year. On this basis, the change in the real oil price since 2003, assuming a proportionate changes in gas prices, may have a similar impact on the economy as unchanged oil and gas prices and the imposition of a carbon price £260/tC ($132/tCO$_2$). However, these impacts may differ according to the precise economic circumstances such as the underlying drivers of price changes. In addition, a carbon price would have relatively greater impacts on the price of more carbon-intensive fuels such as coal.

4.4.9 Climate change mitigation policies will ultimately affect the users of energy intensive products as, ultimately, all costs of energy price rises will be borne by consumers. However, analysis conducted by the Stern Review suggests that cost increases may not necessarily be that large for households. The input output analysis identified a 0.9% long run increase in consumer prices arising from a £70/tC carbon price.[32] Furthermore, climate change mitigation policies may incentivise the take up of cost effective energy saving technologies among energy users. While it can be argued that delivering the proposed mitigation framework will increase the number of households exposed to fuel poverty, the extent of this could be limited by energy efficiency inducements (outlined in the next section) as well as carefully targeted policies to address such secondary effects. The Committee on Climate Change (in advising on carbon budgets), and the Government (in setting them) will have regard to this issue when implementing the framework.

Encouraging innovation and resource efficiency

4.4.10 The potentially negative impact of mitigation policies as a result of higher energy prices (leading to a potential increase in fuel poverty) and reduced growth, may be offset by induced improvements in energy efficiency. Analysis attributed positive macroeconomic effects to energy efficiency policies implemented as part of the Climate Change Programme in the form of lower inflation and higher output, in particular: a 0.3% reduction in the annual growth rate of prices (i.e. lower inflation) for 2005-10 and a 0.1% increase in the annual GDP growth rate

[32] Stern Review Chapter 11.

for 2005-10.[33] Analysis outlined in paragraph 5.1.33 identified significant cost effective abatement potential across the UK economy. It is likely that further policies could help uncover further economic benefits. For example, analysis of the potential impacts of the Energy Performance Commitment[34] suggested that there was significant, untapped cost effective potential for emission reductions in large, non-energy intensive organisations (up to up to 11% of current emissions from the sector). Energy efficiency measures are clearly an important policy tool, with reduced energy use having not just macroeconomic benefits but important co-benefits such as reduced fuel poverty and increased energy security. Such considerations are key when considering the unilateral nature of the emissions reduction framework.

4.4.11 Furthermore, some academics challenge the traditional theoretical view that early adopters of climate change mitigation policies adversely impact on their industries by creating additional costs. Porter identifies examples of environment regulation/policies which lead to innovation by creating pressures that encourage firms to look for 'cleaner' and/or more efficient production technologies and processes.[35] Denmark's success in wind energy is often cited as a case of regulation led innovation – creating both local jobs and expertise that has been exported globally. The overall costs of regulation depend on the precise policy context. However, it is likely that performance standards induce the creation and adoption of new technologies although at some real opportunity cost.[36]

The choice of policy mix

4.4.12 The choice of policy instrument is also likely to have a significant distributional effect: regulation, market mechanisms or fiscal measures will have divergent distributional impacts. However, even within these particular tools different designs are likely to have markedly different sectoral impacts. For example, the allocation methodology used in emissions trading has large distributional impacts. When allowances are grandfathered[37] there is scope for some allowances to make windfall profits by passing on the (opportunity) cost of the permits despite receiving costless emissions allocation rights. DTI analysis has estimated that the large electricity generators gained £1.2 - £1.3 billion in 2005 arising from grandfathering of emission allowances under the EU-ETS.

4.4.13 **Overall, the distribution of impacts from implementing the proposed carbon management framework is likely to be uneven, with a small number of energy intensive industries affected potentially more**

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[33] Barker et al,. The Macro-Economic Rebound Effect and the UK Economy, A report to DEFRA May 2006. http://www.defra.gov.uk/science/Project_Data/DocumentLibrary/EE01015/EE01015_3554_FRP.pdf

[34] 'Energy Efficiency and Trading Part II: Options for the implementation of New Mandatory UK Emissions Trading'. NERA consulting 2006.

[35] M. E. Porter, C. van der Linde, (1995), "Toward a New Conception of the Environment–Competitiveness Relationship", *Journal of Economic Perspectives*, Fall 1995, pp. 97–118.

[36] See, for example, Palmer, K., W.E. Oates and P.R. Portney (1995): 'Tightening environmental standards: The benefit-cost or the no-cost paradigm?' Journal of Economic Perspectives 9:119–132

[37] Grandfathering involves allocating allowances to firms on the basis of their past emissions. Firms that polluted more in the past would have larger shares. Grandfathering has the disadvantage of favouring existing firms and creating barriers to entry by new firms wanting to set up.

significantly (particularly those exposed to international competition), whereas less energy intensive areas of the economy, such as services and residential, are likely to be much less affected. Other sectors, such as environmental consultancy and financial services, may have opportunities to benefit from more robust mitigation frameworks, especially if these are replicated internationally.

4.4.14 **The degree to which UK mitigation is replicated internationally is likely to have an important influence on the distribution of costs, particularly for sectors which are exposed to high degrees of international competition. Continued emphasis on the EU-ETS, which ensures a common price signal across participating installations across the EU, together with active participation in international emissions reduction credits markets, are key to mitigating these costs and risks.**

5. Detailed Analysis of Measures

5.0.1 This section discusses options considered as part of the development of the detailed provisions in the draft Bill, in relation to four key measures:

- Section 5.1: The design of a system of statutory targets and carbon budgets.
- Section 5.2: The creation of a new Non-Departmental Public Body (NDPB) – "The Committee on Climate Change" - to provide independent analysis and advice on meeting these targets and budgets.
- Section 5.3: New enabling powers to facilitate the introduction of future trading schemes through secondary legislation.
- Section 5.4: A reporting structure which allows continuous assessment of the UK's performance in reducing its CO_2 emissions, and of the Government's policies and proposals on adaptation measures.

Section 5.5 presents the package of chosen options proposed in the draft Bill, and summarises how these provide the best balance of costs and benefits for the UK in adopting this legislation.

5.0.2 The overall package of measures is intended to minimise the cost of mitigation to the UK for a given set of statutory targets, by establishing an optimal emissions reduction trajectory, supported by robust and transparent advice from the proposed Committee on Climate Change.

5.0.3 The measures are designed to provide greater certainty for the UK to plan effectively for, and invest in, a low-carbon economy, while retaining sufficient flexibility to minimise the adverse impact on the UK's wider economic, social and policy objectives. However, a degree of flexibility is particularly important given the unilateral nature of the targets, and the need to be mindful of competitiveness impacts on UK businesses. This flexibility will be provided by:

- allowing emissions targets and budgets to be met by a degree of purchasing emissions reductions credits from overseas, allowing least-cost abatement measures to be utilised regardless of their location (i.e. whether at home or abroad);
- allowing both the banking and limited borrowing of emissions rights between carbon budget periods, in order to adjust the emissions reduction pathway without affecting total cumulative emissions, and crucially without unduly harming the credibility and predictability of the emissions reduction pathway; and,
- providing the ability to more fundamentally review the level of statutory carbon budgets if the basis on which a budget was initially set has significantly changed, and only following advice from the Committee on Climate Change and with approval from Parliament.

In summary, the framework established by the Climate Change Bill will therefore ensure a balance is struck between flexibility and certainty.

5.0.4 The individual measures outlined in Sections 5.1 to 5.4 are described in a largely qualitative way. This is principally because the detailed quantitative costs

and benefits will depend on the precise emissions reduction pathway and carbon budgets set, and the ways in which this reduction pathway is intended to be met. It is therefore crucial that on recommending and setting budgets, the Committee on Climate Change and Government respectively provide a detailed assessment of the costs and benefits of achieving the budgets. Additionally, the full RIA for the Bill should include a more involved analysis of the proposed package of measures.

5.1 Targets and Trajectories (Issues 1-6)

Issue 1: How should the Government set its objectives in order to manage the transition to a low-carbon economy?

Option 1	***Option 2***	***Option 3***
Retain existing system of non-statutory CO_2 emissions reduction targets	*Establish 5 year carbon budgets in secondary legislation, in addition to statutory 2020/ 2050 targets*	*Place annual CO_2 targets in primary or secondary legislation*

5.1.1 It is desirable that the Government's framework should establish credible, flexible and certain mitigation objectives. Credible, certain policy frameworks are necessary to drive sufficient low-carbon investment which is essential for the transition to a low-carbon economy. However, the underlying uncertainties outlined in Section 4.3 mean that any framework needs to be flexible to allow decision makers to respond to unexpected circumstances or revised information affecting the relative costs of actions and inaction.

Option 1:

5.1.2 The Government currently adopts legally-binding international targets supplemented by ambitious UK policy commitments. Under the Kyoto protocol, the UK is committed to taking responsibility for a 12.5% reduction in global GHG-s by 2008-12 (compared to 1990 levels).[38] This is an international obligation which the UK is well on track to exceed. In addition, it has established targets for domestic policy to deliver a 60% reduction in CO_2 emissions, through domestic and international effort, by 2050 on the same basis (as set out in the 2003 Energy White Paper). This long run target is supplemented by interim targets, in particular: manifesto commitments to reduce CO_2 emissions by 20% by 2010, and a 'real progress' target range of 26-32% reductions by 2020 (which was also set out in the 2003 Energy White Paper).

[38] With 1995 baseline levels for some greenhouse gases.GHGs. The UK 'has responsibility for' this emissions reduction level as it can meet its Kyoto target through the use of international trading and flexible mechanisms (essentially constituting the financing of emissions reductions overseas).

Benefits:

5.1.3 The current approach places the UK at the forefront of a set of developed countries attempting to respond to the challenge of climate change. The combination of legally-binding international targets, supplemented by ambitious UK policy commitments, has created the conditions for:

- the introduction of ambitious domestic policies, for example, as part of the Climate Change Programme and forthcoming 2007 Energy White Paper;
- active diplomatic leadership to promote collective action (for example by putting climate change on top of its agenda for the dual presidencies of the G8 and the EU in 2005); and,
- leadership in improving our understanding of the costs and risks of climate change, for example by commissioning the recent Stern Review, which has had worldwide coverage and influence in the debate climate change.

Costs:

5.1.4 The system of non-statutory Government targets for a long run CO_2 emissions reduction of 60%, through domestic and international effort, by 2050 (based on 1990 levels), supported by non-statutory interim targets for 2010 and 2020, does not provide sufficient certainty that these targets will be met. In particular, UK households and firms may:

- the potential impact of purchasing emissions reductions overseas on the capacity of the UK to demonstrate international leadership (resulting in slower transformation in the carbon intensity of domestic markets).
- perceive a high risk that the long run target and/or interim targets may be readily revised by current or future administrations; and,
- be uncertain about the intended trajectory towards these targets.

5.1.5 This, in turn, increases the uncertainty surrounding the scale and timing of future policy interventions and, as a result, the returns to investment in less carbon-intensive capital or behavioural change. This is likely to reduce the willingness of firms and households to make such investments, as outlined in Section 4.1.

5.1.6 In addition, a set of aspirational, non-statutory targets does not provide the level of certainty needed by the UK to demonstrate the requisite leadership required to signal its intentions to address climate change. This risks weakening the UK's ability to help overcome the international collective action problems associated with global action on climate change.

<u>Option 2:</u>

5.1.7 This option proposes a statutory target to reduce CO_2 emissions by 60%, through domestic and international effort, by 2050 (compared to 1990 levels) and, in addition, a system of statutory five-yearly 'carbon budgets', to be placed in secondary legislation for at least three periods (15 years) ahead, in order to provide a medium-term trajectory towards the delivery of the 2050 target. As outlined in the consultation document, a "carbon budget" refers to the aggregate quantity of CO_2 emissions permitted over a five year period.

5.1.8 Carbon budgets would initially be established for the periods 2008-12 (consistent with the first Kyoto Protocol commitment period), 2013-17 and 2018-22. The budget for 2018-22 would be set consistent with the Government's existing target range of a 26-32% cut in emissions by 2020, providing a firm legislative boundary for the trajectory to 2050.

5.1.9 The Government of the day would be directly accountable to Parliament for the delivery of both the 2050 target, and the achievement of the five year budgets. In the event that either budgets were exceeded or the target not met, Government would be liable for judicial review. In addition, placing these objectives in legislation means that Parliamentary approval would be required in order to amend them. More detailed analysis of the circumstances in which these targets and budgets might be amended is provided in Issue 2 below.

5.1.10 The proposed system would apply only to CO_2 emissions but Government would keep under review the question of including targets and budgets for other GHGs within the framework. This is also the subject of more detailed consultation (and is discussed later in this section under Issue 4).

Benefits:

5.1.11 The proposed system of legislative targets, supported by five-yearly carbon budgets established three periods (15 years) ahead, would enhance the level of certainty for households and firms making longer term investment decisions and actions to reduce their CO_2 emissions. This system would establish a more clearly defined trajectory towards a low-carbon economy, and provide Parliamentary controls over revisions to these legally-binding policy commitments. This is particularly important given the current lack of an international agreement extending beyond 2012. Some stakeholders have indicated that "the UK should set a clear, long-term emissions reduction target, which…should be backed up with milestones, in the form of intermediate targets that are realistic yet challenging in terms of what can be achieved, and are structured so that business investment cycles can take them into account".[39]

5.1.12 Carbon budgets would be set with a view to achieving the optimal balance of social and economic costs and benefits (illustrative impacts of different trajectories on mitigation costs are outlined in Section 4.3). In addition, carbon budgets are likely to be more credible because they limit cumulative emissions in the period. This means that they are less sensitive to short-run fluctuations in annual emissions (such as an unexpectedly cold winter leading to higher-than-expected heating fuel demand). They thus retain some inherent flexibility to allow Government to manage policy in response to, for example variations affecting energy demand (particularly if such unexpected events occur early in a budget period), whilst at the same time ensuring that every tonne of CO_2 counts towards the budgets. Issues 2, 3 and 4 consider mechanisms for the provision of additional flexibility.

[39] Confederation of British Industry submission to the Stern Review http://www.hm-treasury.gov.uk/media/FC6/5C/climatechange_cbi_1.pdf

5.1.13 Furthermore, this approach creates a policy framework to enable the UK to demonstrate leadership, thereby helping to foster the conditions for further international cooperation, in a way which is consistent with international emissions reduction obligations under the Kyoto Protocol and as part of the EU-ETS. The first Kyoto phase and Phases I and II of the EU-ETS are also expressed in terms of average annual emissions over a five-year period (2008-2012). The EU-ETS Directive additionally provides for a succession of five-year periods for future phases of the scheme. As the EU-ETS currently covers some 50% of UK emissions, there would be clear advantages in adopting these time periods for UK domestic policy as a whole.

Costs:

5.1.14 The likely range of long and short run costs associated with achieving the proposed statutory targets are outlined in Section 4.2. The potential costs of establishing the proposed framework primarily relate to the resource requirements associated with the establishment of the proposed Committee on Climate Change (these are outlined under Issue 6).

Option 3:

5.1.15 The third option proposed is to replace the current one-off 2010, 2020 and 2050 targets with annual targets placed in either primary or secondary legislation. This would establish a set of year-on-year targets consistent with (currently five-yearly) international legal obligations under Kyoto and Phase II and future phases of the EU-ETS and also, assuming no change in Government policy, consistency with the long range target of a 60% reduction by 2050 (equating to around a 1.2% average annual reduction). Placing these targets in legislation would, as for Option 2, make the Government directly accountable to Parliament for their delivery (in this case annually); and in the event that any target was not achieved, liable for judicial review.

Benefits:

5.1.16 Annualised targets would establish a narrowly-defined trajectory towards the achievement of the Government's long-run objective to reduce CO_2 emissions, through domestic action and international effort, by 2050 compared to 1990 levels. This would:

- increase certainty among consumers and producers surrounding the Government's willingness to implement mitigation policies, with strong impacts on incentives to invest and innovate; and
- fix expected cumulative emissions over the period to 2050 (although there is very limited environmental benefit associated with this).

Costs:

5.1.17 Annual targets provide policymakers with very limited flexibility to respond to changes in both the medium and long run expected cost of mitigation, as well as short run volatility in markets affecting energy demand. This has the potential to:

- increase mitigation costs by limiting the capacity of policymakers to adjust the timing of emissions reductions in response to revised information regarding, for example, the pace of technological development;
- increase costs as a result of the inability to respond to unexpected events by implementing the most cost-effective policies (which would take time to implement);

- reduce credibility in the policy framework because households and firms may perceive that a Government has limited capacity to invoke policies to respond to natural market variability effectively (whereas, under Option 2, a system of carbon budgets offers a degree of additional flexibility), or may be unwilling to sustain the framework without flexibility to respond to adverse circumstances;[40]
- create incentives for policy makers and stakeholders to focus on short term mitigation objectives rather than longer run drivers of increasing atmospheric CO_2 concentrations (for example, potentially resulting in policies which simply shift emissions to a later time period); and,
- create inconsistency with commitments as part of international agreements which are currently based on five year budgets (or additional administrative complexity to resolve this).

Issue 2: Should there be a facility to review statutory targets and/or interim budgets (if adopting either Option 2 or 3 under Issue 1)?

Option 1	**Option 2**
No, under any circumstances	*Yes, but only as a result of significant changes*

5.1.18 The draft Bill proposes a system of unilateral, statutory targets and budgets. It is therefore important to consider whether, and in what circumstances, these could be amended in the context of managing environmental risk, economic cost and wider policy objectives effectively.

Option 1:

5.1.19 Under the first option, there would be no facility to amend the 2050 target and the 2020 target (with which the 2018-22 budget would be made consistent), once these targets were set in statute. In addition, there would be no flexibility to review any profile of carbon budgets once they had been set in statute.

Benefits:

5.1.20 This would provide households and firms with the greatest degree of certainty surrounding the intention of Government to manage policies designed to deliver a defined level of emissions reductions in a particular time period. This would potentially help provide a clear incentive to invest optimally in reducing carbon intensity (although, as outlined previously, insufficient flexibility may result in markets being unwilling to believe that any Government would maintain its policies in the event of adverse circumstances).

[40] For example, markets may be not believe that a Government would maintain a carbon policy that resulted in very high price spikes or that had strongly negative consequences for competitiveness. The precedents of the Exchange Rate Mechanism and the Stability and Growth Pact illustrate the difficulties of maintaining fixed policies against market speculation or in the face of unexpected economic pressures.

Costs:

5.1.21 The science of climate change is developing our understanding of the level of environmental risk for given concentration levels of GHGs. In addition, there are uncertainties surrounding the factors affecting the future costs of mitigation (outlined in Section 4.3), resulting from the need to formulate long term expectations affecting the choice of emissions reductions pathway, such as the degree of international commitment to reduce GHG emissions and the cost of fossil fuels or less carbon-intensive technologies. Tightly restricting the capacity of the Government to amend either the long run or interim target might result in exposure to undesirable economic costs or competitiveness risks, and potentially to reduced credibility in the framework as a whole.

Option 2:

5.1.22 Under the second option, the Government would have the ability to review the 2050 and 2020 statutory targets in the light of significant developments in climate science or in international law or policy. For example, a review might be exercised in the event that a new multilateral agreement requires the UK to adopt more stringent emissions reduction targets. Alternatively, changes in climate science and global warming might imply the need for higher or lower degrees of emissions reductions internationally, which would need to be reflected in the domestic framework.

5.1.23 Under this option, there would be also be some flexibility to amend statutory carbon budgets as a result of significant changes affecting the basis upon which the Secretary of State originally set, or last amended, the budgets. The principal factors that the Secretary of State will consider when setting budgets are:

- meeting the statutory targets in the legislation;
- compliance with the UK's international obligations;
- scientific knowledge about climate change;
- technology relevant to climate change;
- economic circumstances, and in particular the likely impact of the decision on the economy and the competitiveness of particular sectors of the economy;
- fiscal circumstances, and in particular the likely impact of the decisions on taxation, public spending and public borrowing;[41]
- social circumstances, and in particular the likely impact of the decision on fuel poverty;[42]
- energy policy, and in particular the likely impact of the decision on energy supplies and the carbon and energy intensity of the economy; and,
- international circumstances.

[41] A fiscal circumstance includes effects on taxation, public spending and public borrowing. In relation to a budget which would require significant public spending on credits in order to stay within it, the fact that the government may need to increase the overall tax burden to do so must be taken into account. Fiscal circumstances could also change as a result of changes in the economy or other external changes.

[42] A person living in fuel poverty is defined in section 1 of the Warm Homes and Energy Conservation Act 2000 as being a person who is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost. We consider that "social factors" on its own is a rather wide and unwieldy term and we think that it would be useful for fuel poverty to be given as a specific example so as to impliedly limit its scope.

5.1.24 So, for example, the Government could seek agreement from Parliament to re-profile (i.e. amend) the carbon budgets, so that emissions reductions could be spread over a longer timeframe, if it became clear that the emissions forecasts used when a budget had initially been set proved to be significantly inaccurate. This could result from large changes in the price of gas on international markets, or the pace of development in a new technology such as carbon capture and storage, such that the only policy options available to meet a budget would result in unacceptable economic costs. However, to ensure credibility and minimize the impact on certainty, the same Parliamentary process would be used for amending budgets as was used to set them in the first place.

Benefits:

5.1.25 The capacity to review budgets or targets would enable policy makers to:

- minimise economic and social costs and competitiveness risks arising from significant changes to key drivers of mitigation costs (the extent of these potential impacts are outlined in Section 4.3); and,
- continue to demonstrate international leadership in the light of revised assessments surrounding environmental risk.

Costs:

5.1.26 As outlined above, a review facility reduces the certainty among households and firms about the long run scale and timing of the Government's objectives to reduce emissions. This has implications for the way in which it can be expected to manage policy. However, it is proposed that there will be strict controls around the capacity of Government to exercise such a clause. The Government's decision as to whether to exercise such a review for either the statutory targets or budgets would be subject to Parliamentary approval under the affirmative resolution procedure. In the case of amending carbon budgets, the Government would also be required to seek published advice from the Committee on Climate Change.[43] Overall, given the political and Parliamentary risks and constraints surrounding the execution of any review clause, it is likely that the adverse impact of such a mechanism on certainty would be limited.

Issue 3: To what extent should emissions reduction 'effort' purchased by the UK from other countries be allowed to contribute towards the UK's targets and budgets (if adopting either Option 2 or 3 under Issue 1)?

Option 1	**Option 2**
Only traded effort within sectors covered by the EU-ETS should be allowed	*Traded effort, up to the level of UK obligations under international law, should be allowed across the whole economy*

[43] The statutory targets could be changed by the Government without it first asking the Committee on Climate Change, given that the targets themselves define the framework within which the Committee will provide its advice on least-cost abatement.

5.1.27 As GHG emissions are a global externality; the location of emissions reductions does not change their environmental value. However, it may be cheaper to abate in some sectors than others due to greater availability of mature technological or process substitutes. Alternatively, investment in less developed countries may deliver relatively greater emissions reductions due to the existence of less efficient capital stock. Flexibility to choose where to invest to reduce GHG emissions is a key pillar of existing multilateral frameworks.

5.1.28 As outlined in paragraph 4.1.7, the Kyoto Protocol establishes a system of tradable emissions reductions credits, (the CDM and JI mechanisms), which allow "Annex 1" countries (developed countries with direct emissions reductions obligations) to invest in mitigation projects in developing countries in order to meet their own GHG reduction targets. This is also consistent with wider policy objectives on international development, as it results in the transfer of finance and technology to developing countries. However, the Kyoto Protocol also supports the "principle of supplementarity", which asserts that (Annex I) countries should use the project mechanisms in a way which is supplemental to domestic emissions reductions meaning they should therefore achieve a significant part of their emissions reductions obligations through domestic effort.

5.1.29 In addition, the EU-ETS determines that any emissions reductions resulting from the purchase of an emissions allowance ('effort') overseas by a UK installation counts towards our domestic targets. This decision is typically determined by whether it is cheaper to abate directly or buy credits in the event of scarcity at firm level.

Option 1:

5.1.30 Under this option, UK financed emissions reductions abroad would not be constrained in sectors covered by the EU-ETS as this would not be lawful under the EU Directive (although limitations are imposed on the uptake of international project CDM and JI credits as part of this mechanism). However, across sectors not currently covered by the EU-ETS, such as transport and heat, the Government would require mitigation objectives to be achieved only through domestic CO_2 emissions reductions.

Benefits:

5.1.30 A carbon management mechanism which requires emissions reduction objectives, falling on sectors not covered by the EU-ETS, to be realised directly (without any purchase of international emission reduction credits) has a number of potential benefits, in particular:

- reduced risk of domestic 'lock in' to carbon intensive energy systems;
- potentially, increased international leadership from demonstrating a greater degree of domestic carbon intensity reduction (although counter-balanced by less UK investment in developing international emissions markets); and
- potentially a greater volume of ancillary benefits (although, as outlined in Section 4.1, the precise nature of these is highly policy dependent).

Costs:

5.1.32 Constraining access to markets for international emissions reduction credits would potentially increase the costs of UK mitigation for a given environmental outcome or, put another way, reduce the potential environmental benefits

achievable at a given cost. This would occur if it were necessary to raise the carbon price (or cost of policies to improve the effectiveness of a carbon price) in markets for heat and transport above that prevailing in the international market, in order to realise the target level of cumulative emissions savings. In essence, this option would artificially increase the carbon price in the UK compared to the rest of the world, distorting firms' investment decisions and increasing economic costs.

5.1.33 The overall extent of this cost increase would depend on the volume of emissions reductions required to meet the target for which the marginal cost exceeded the prevailing international carbon price. Research conducted as part of the Energy Efficiency Innovation Report[44] identified relatively large volumes of domestic cost effective abatement potential, amounting to 55 $MtCO_2$ of carbon savings by 2020 (although some of this has already been captured by policies announced since publication).[45] This implies that the overall costs of imposing this constraint could be small, at least in the short and medium term. However, to be most cost-effective these savings would need to be realised at appropriate points in investment cycles.

5.1.34 Failure of the UK to participate in international emissions reduction markets could discourage the level of ambition of other countries who followed suit, and deny the UK potential links to emissions trading schemes being developed and proposed in a number of countries (e.g. Norway, Switzerland, Japan and state-level schemes in the US and Australia). Furthermore, it would limit the UK the ability to transfer finance and technology to developing countries through the use of project credit mechanisms.

Option 2:

5.1.35 Under this option, Government would potentially introduce policies which allow for flexibility in terms of where emissions reductions are realised, across the entire economy (including those sectors not currently covered by the EU-ETS). This might be achieved through the extension of the EU-ETS scheme or through the purchase of JI or CDM emissions reductions credits *(although it is important to recognise that the existence of project credit markets beyond 2012 is subject to a subsequent international agreement).*

Benefits:

5.1.36 As outlined previously, allowing sufficient purchases of effort to realise emissions savings internationally increases the flexibility of the framework, thereby potentially reducing mitigation costs (where the marginal costs of abating domestically in sectors not covered by the EU-ETS would exceed the prevailing international carbon price). However, in the event that an international

[44] Published by HMG in December 2005 http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr05/other_docs/prebud_pbr05_odenergy.cfm

[45] "Review and development of carbon dioxide abatement curves for available technologies as part of the Energy Efficiency Innovation Review", January 2006. See http://www.defra.gov.uk/environment/energy/eeir/index.htm. Analysis based on discounts rates higher than the Social Time Preference rate (STPR, which is 3.5% per annum for the next 30 years) as stipulated in HM Treasury's Green Book, Appraisal and Evaluation in Central Government (see http://greenbook.treasury.gov.uk/). Use of STPR would yield *higher* cost-effective potential.

agreement extending beyond 2012 is not achieved, it is important to recognise that this would only be achievable through an extension to the EU-ETS as project credit mechanisms are dependent on such a commitment framework.

5.1.37 Table 2 highlights indicative analysis, using preliminary results from MACRO MARKAL modelling undertaken as part of the forthcoming 2007 Energy White Paper, suggests that the lower-end long run costs of meeting the 2050 60% emissions reduction target could be reduced through the purchase of international emissions reduction credits. An illustrative estimate suggests that purchasing one-third of the effort through international emissions reduction credits, assuming a unitary carbon price of €25/tCO_2e, could reduce total abatement costs by approximately a quarter. Further dynamic analysis, undertaken as part of the forthcoming 2007 Energy White Paper, indicated that the potential to reduce short and medium run transition costs through purchase of international emissions reduction credits.

Table 2: Analysis of Mitigation Costs in 2050: All Domestic Abatement versus One Third UK-financed International Effort,[46] £bns (2000 Prices)

Scenarios:	**All domestic**	**2/3 domestic, 1/3 overseas**
Annual domestic abatement cost in 2050 (from MARKAL MACRO modelling)	20.3	13.2
Annual cost of buying-in in 2050 (from carbon price assumption of €25/tCO_2e)	0	1.8
Total (% of 2050 GDP**)**	**20.3** (0.7%)	**15** (0.5%)

Costs:

5.1.38 As discussed above, the principal disadvantages of retaining the additional flexibility of purchasing emissions reductions credits overseas are that it would:

- restrict the pace of decarbonisation of the UK economy, by encouraging Government and firms to use overseas credits as a cheaper short-term option; expose the UK to the risk of 'lock in' to high carbon technologies; and
- potentially reduce the ability of the UK to demonstrate leadership, by transforming the carbon intensity of domestic transport and heat markets, thereby negatively impacting on the overall conditions for further international cooperation.

Issue 4: Should any system of carbon management based on carbon budgets allow 'banking' and / or limited 'borrowing' between budget periods? (if adopting Option 2 under Issue 1)?

Option 1	**Option 2**	**Option 3**
No inter-budget flexibility	*Banking only allowed*	*Banking and limited borrowing allowed*

[46] Based on scenarios of 60% and 40% reduction by 2050 as estimated by MARKAL-MACRO. Credit prices are assumed to retain the real value of €25/CO_2e.

5.1.40 As outlined in Sections 4.2 and 4.3, the overall cost of reducing the UK's impact on climate change is likely to be affected by the choice of emissions reduction pathway as well other factors such as future technology and fossil fuels costs. As such, a system of five year carbon budgets, established three periods ahead, would require the formation of detailed expectations surrounding these factors over a period of around 15 years. However, factors affecting emissions or the cost of mitigation may be subject to short term shocks or periods of volatility, potentially leading to sharp increases in the costs of meeting budgets.

5.1.41 This section discusses the desirability of banking and borrowing to allow policy makers to minimise costs or competitiveness risks in response to such short run factors, or to smooth incentives across commitment periods when managing the timing of emissions reductions. 'Banking' allows Government to carry unused emissions rights over to later budget periods while 'borrowing' would allow a Government to bring forward emissions allocations from future budget periods.

Option 1:

5.1.42 Under the first option, there would be no flexibility to bank unused parts of a budget in the event that emissions were lower than targeted and, in addition, no facility to 'borrow' allocations from a future budget period in the event that emissions were greater-than-expected. As a result, policy makers would be required to respond to unexpected circumstances in market conditions by managing policies, particularly those affecting the prevailing carbon price and the persistence of market distortions, or purchasing emissions reductions overseas (subject to the decision under Issue 3). As outlined in Issue 2, the Government could also have the capacity for a wider review of the carbon budgets in the event of significant changes to the basis on which they were originally set (outlined in paragraph 5.1.23).

Benefits:

5.1.43 While there is some flexibility to manage emissions within a particular budget period, fully constraining inter-budget flexibility increases certainty surrounding the precise timing of emissions reductions. Households and firms would then be able to form clear expectations surrounding the likely breadth, scale and timing of policies to reduce emissions reductions.

Costs:

5.1.44 The absence of banking might weaken the incentives of policy makers to realise larger-than-needed cost-effective abatement, arising for example from earlier-than-expected availability of new technologies or a change in the underlying preferences of households and firms towards placing greater value on the need for energy conservation. This might result in a missed opportunity for the UK to demonstrate additional leadership in emissions reductions or increased short and medium run mitigation costs, as policy makers may need to institute a step change in policy once a new budget period begins (especially if it is perceived to be substantially more constraining).

5.1.45 Conversely, it may be desirable to delay the timing of emissions reductions slightly if they rose temporarily as a result of an unexpected shock such as an unexpectedly cold winter in the final year of a budget period. Equally, such a

delay could be appropriate in the event that final verified emissions data (available over a year after the close of the budget period) were slightly higher than expected based on projected figures towards the end of the budget period. Without the availability of a small borrowing facility to make the necessary accounting adjustment, the Government would be forced to purchase credits on the international markets unexpectedly. In addition, the absence of either banking or borrowing may marginally increase the likelihood of needing to review the budget profile.

Option 2:

5.1.46 Under this option, the framework would operate in the same way as under the first option, except that the Government would be allowed to bank unused emissions rights for use in a successive period. Banking is the ability to carry over unused quotas from one budget period to a future period and is an accepted principle of the Kyoto Protocol. It is envisaged that banking would not require Parliamentary approval, but would only be used once the Government had first sought advice from the Committee on Climate Change, in order to maximise the transparency of its decision.

Benefits:

5.1.47 Banking incentivises 'over-performance' in one period and, in the case of policies designed to establish a carbon price, reduces the risk of price spikes or crashes at the end of budget periods. This may reduce the costs of mitigation, particularly where abatement could become more expensive over time. For example, the heavy use of banking in the US Acid Rain Program has been seen by some as a success in terms of delivering early reductions and improving efficiency. Research[47] found that 30% of allowances were banked between 1995-99 (Phase One of the programme). Firms made efficient decisions to make earlier reductions and banked allowances forward, due to the expectation of tighter caps in future phases. As a result, in total, emissions reduced in Phase One were twice that required to meet the cap in Phase Two. In addition, the potential flexibility of banking to bring forward the profile of emissions reductions may send out important signals surrounding the capacity of the UK to demonstrate leadership in achieving early emissions reductions.

Costs:

5.1.48 Banking may detract from investor confidence by increasing uncertainty surrounding the precise profile of emissions reductions. Evidence from trading schemes suggests that unrestricted banking can also allow emissions to be concentrated in time.[48] Overall the impact on certainty can be limited through the establishment of clear rules surrounding the operations of this element of the framework as well as transparent advice and analysis by and for Government.

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[47] Ellerman, A. and J. Pontero (2005): 'The Efficiency and Robustness of Allowance Banking in the US Acid Rain Programme', Working Paper 0505, Centre for Energy and Environmental Policy Research, Massachusetts Institute of Technolgy, Massachusetts

[48] Tietenberg, T. (1998): 'Tradable Permits and the Control of Air Pollution in the United States' Colby College, Department of Economics, Working Paper.

Option 3:

5.1.49 Under the third option, the framework would be the same as under Option 2 except that Government would, under certain circumstances and to a limited extent, also be allowed to borrow budget allocations from the following period. 'Borrowing' allows a Government to bring forward emissions allocations from future budget periods. It is proposed that the maximum permitted level of borrowing would be equivalent to 1% of the subsequent carbon budget.

5.1.50 It is envisaged that borrowing might be utilised to dampen the impact of a short run shock (as opposed to use of a wider budget review as discussed in Issue 2). It is proposed that before borrowing (as with banking), the Government should first obtain (published) advice from the Committee on Climate Change but that this procedure would not be subject to Parliamentary approval.

Benefits:

5.1.51 The capacity to borrow would help to:

- reduce the costs of mitigation arising from the need to manage policy in response to short run shocks or volatility in emissions or the cost of abatement; and deal with "accounting errors" due to time lags in data availability;
- promote credibility in the overall framework by increasing the capacity of the Government to manage the delivery of the budget constraints in the event such events; and,
- do so within a tight limit (1%) which would substantially reduce the risk of undermining the certainty provided by the carbon budgeting framework.

Costs:

5.1.52 Borrowing may impose a cost by reducing certainty surrounding the precise profile of emissions reductions. Furthermore, it might limit the potential of Government to deliver the following carbon budget, thereby reducing credibility in the overall framework. Box 2 outlines these indicative impacts in the first two budget periods. As noted, these risks provide a strong argument for limiting it the extent of the possible use of this mechanism. There may also be presentational costs associated with allowing borrowing, since this facility is not currently allowed under the Kyoto Protocol or EU-ETS. Under both frameworks, there is a legal obligation to deliver reductions in emissions irrespective of prevailing economic, technology and weather conditions (which the UK has always supported).

5.1.53 However, these costs are likely to be limited due to the fact that:

- the draft Bill proposes unilateral long term targets, which could put additional risks on UK competitiveness, so additional flexibility is desirable;
- the UK's national targets are (and are likely to continue to be) more stringent than our international targets; borrowing would not be permitted in relation to emissions reductions obligations under multilateral agreements;
- the draft Bill proposes a series of carbon budgets (agreed unilaterally three periods ahead); as such, unlike in the multilateral context, the level of the subsequent budget from which we would be borrowing is clearly defined; and,
- domestic borrowing, unlike the multilateral context, has (virtually) no environmental implications. This is because very limited borrowing from a

successive UK budget allocation is proposed (which as a whole only represents approximately 2% of the total global addition to the overall stock of GHGs over the period).

Box 2: Considering the Impact of Borrowing on Chances of Meeting Carbon Budgets

As outlined in Section 4.3, there are a number of uncertainties that affect the UK's ability to stay within a given carbon budget. Based on the Government's own assessment of market uncertainties (although not those affecting the effectiveness of mitigation policies directly), it is useful to consider the potential impact of introducing a borrowing limit of up to 1% of a successive budget period on the likelihood of meeting:

- an illustrative carbon budget in 2008-12 (assuming no additional policy or purchase of overseas emissions reduction credits); and,
- an illustrative carbon budget in 20013-17 (assuming no further borrowing).

Table 3 below shows that introducing a borrowing limit of up to 1% would increase the likelihood of the Government meeting an illustrative carbon budget in 2008-12 (which it currently considers it would have a 75% likelihood chance of meeting, given existing policies and expectations of market uncertainties) by approximately 9%.

Table 3 Impact of Borrowing on Probability of Meeting Illustrative Carbon Budget, '08-12

Borrowing Rate	Probability of meeting 2008-12 budget
None	75%
0.50%	80%
0.75%	82%
1.00%	84%

However, borrowing in one period (particularly higher borrowing limits), reduces the potential of Government to meet subsequent budgets. For example, borrowing 1% in the 2008-12 budget period from the 2013-17 carbon budget (also set so that there is a 75% chance of meeting this budget) might reduce the likelihood of meeting this later budget by 9%, whereas a 2% borrowing limit might reduce this probability by 19% (given existing policies and expectations of market uncertainties). However, the probabilities outlined above do not account for uncertainty around the delivery of policy measures.

Policy uncertainty can vary substantially depending on the particular policy (or mix of policies), with policies designed to influence behaviour at a given carbon price often being subject to more uncertainty than fiscal measures or cap and trade schemes (which fix emissions quantities).[49] However, the overall level of uncertainty is likely to reduce as a result of, for example: the expected increased importance of the EU-ETS in the overall mix of mitigation policies; and a reduced capacity to fuel-switch between gas and coal in the generation sector, which would lead to higher emissions if coal was chosen over gas.

[49] Analysis conducted for the National Audit Office (http://www.nao.org.uk/publications/nao_reports/06-07/climate_change_projections.pdf) showed that the Climate Change Programme measures had an uncertainty range roughly equivalent to around 100% of the central expectation of emissions reductions abatement by 2010. This represents 15% of the entire uncertainty surrounding CO2 emissions for this period.

Issue 5: Should any system aiming to manage the reduction of the UK's impact on climate change cover non- CO_2 GHGs? (if adopting either Option 2 or 3 under Issue 1)?

Option 1	Option 2
No (but with review clause to possibly add targets and budgets for other GHGs at a later date)	*Yes – a multi-GHG budget from outset.*

5.1.53 Climate change is caused by various GHGs. The Kyoto Protocol applies to emissions of a basket of six GHG emissions: Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur Hexafluoride (SF_6).[50] CO_2 emissions largely arise from the combustion of fossil fuels. Non-CO_2 GHG emissions arise from a number of sources including agriculture and land use change (largely methane from livestock), and industrial process emissions, for example in the cement and paper industries. Collectively, non-CO_2 emissions accounted for approximately 15% of the UK's overall impact on climate change in 2005 (see Figure 2). It is therefore important to consider whether the UK's emissions reduction framework should include these other GHGs.

Option 1:

5.1.54 Under the first option, a system of 5 year budgets together with statutory targets for emissions reductions in 2020 and 2050 would apply only to CO_2. There would be a review clause to provide the option of allowing this framework to apply to a wider set of GHGs in the future.[51]

Benefits:

5.1.54 Although there are potentially strong scientific and economic arguments in favour of defining the UK's long term goal in terms of GHGs (outlined under the second option), there are also practical arguments against opening up the question of the UK's long-term GHG target at this stage:

- the UK currently has a well established set of targets for CO_2 emissions reductions which covers the majority of the UK's overall impact on climate change (approximately 85% in 2005); these objectives are widely understood and supported by stakeholders;
- a range of international and domestic policies have delivered substantial reductions in non-CO_2 emissions in recent years: Figure 2 shows that there has been a 44% reduction in non-CO_2 emissions between 1990 and 2005,

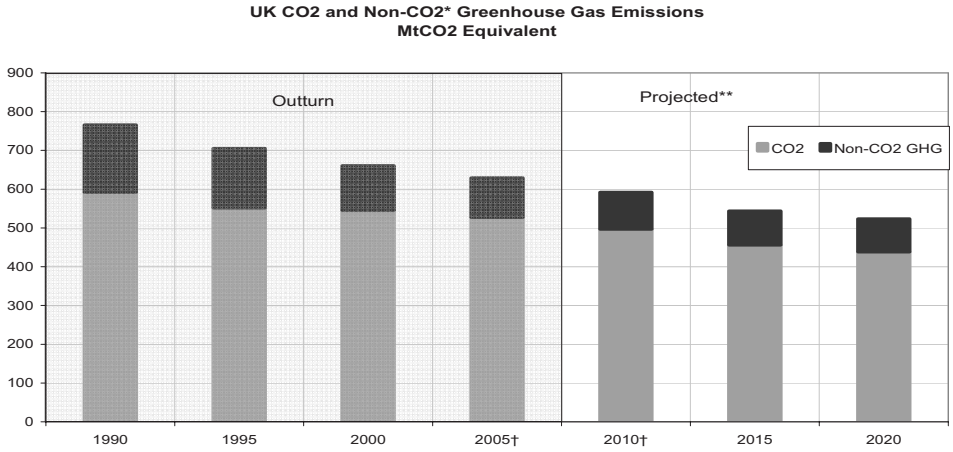
[50] Hydrofluorocarbons (HFCs) are haloalkanes – alkanes where some hydrogen atoms are replaced by fluorine. Perfluorocarbons (PFCs) are compounds containing just fluorine and carbon Hydrofluorocarbons (HFCs) are haloalkanes – alkanes where some hydrogen atoms are replaced by fluorine. Perfluorocarbons (PFCs) are compounds containing just fluorine and carbon.

[51] Although this would require primary legislation as the Bill is currently drafted.

expected to reach 50% by 2020. Box 3 outlines some of these policies in more detail; and,

- additional domestic non-CO_2 abatement is expected to be become difficult and costly. See for example, a recent AEAT study on reducing Methane and HFC emissions from four selected sectors. [52]

Figure 2



Sources:
2006 Climate Change Programme Review, DEFRA News Release - "Gas House statistics" - January 2007, DTI Updated Emission Projections, July 2006 (UEP26)

Notes:
* - Methane, Nitrous Oxide and Fluorinated Gases (HFCs, PFCs and SF_6);
** - Central Expectation. CO_2 emissions projections based on UEP26 (July 2006) plus central expectations of emission savings from July 2006 Energy Review, including 29.3MtCO_2 (8MtC) savings from EU-ETS, plus additional savings from announcements made since.
† - As published in reporting of Greenhouse Gas House statistics, January 2007. 2005 includes net purchases of allowances made under the EU-ETS Phase I.

Costs:

5.1.56 A decision to exclude non-CO_2 gases would mean that approximately 15% of the UK's impact on climate change would not be covered by the proposed carbon management framework. In addition to the reduced environmental coverage, such an approach might create perverse economic incentives to focus on CO_2 even if it were economically or scientifically rational to take firmer action on other gases.

Option 2:

5.1.57 Under the second option, the system of budgets and targets would apply to a basket of GHGs. The value of reductions in emissions of different gases would be commuted to the equivalent amount of CO_2 through their relative global warming potentials: for example if Methane were included within a budget system, an abated tonne of this gas would be worth approximately 23 tonnes of CO_2 reductions due to its relatively more powerful effects on climate change.

[52] "Mechanisms from reducing Methane and HFC emissions from four selected sectors", October 2005. See http://www.defra.gov.uk/environment/climatechange/trading/uk/pdf/aeat-reducing-emissions-report.pdf

Box 3: Tackling Non- CO_2 Emissions

There are a wide range of policies, implemented domestically and through the EU and other forums for international cooperation, designed to tackle non-CO_2 emissions, for example:

- **Methane** is the second most important GHG in the UK after CO_2, contributing 12 per cent of the UK's total emissions of GHGs in 1990. Methane emissions fell by approximately 60% between 1990 and 2005, driven in part by the EU Landfill Directive which imposes strict engineering requirements on landfills, a major source of methane emissions. UK implementation of the Directive aims to achieve reductions of 75%, 50% and 35% of the total amount by 2010, 2013 and 2020 respectively (based on the amount of waste produced in 1995).
- Emissions of **fluorinated or industrial gases** are small in absolute terms (14MtCO2e or 8% of UK total GHG emissions in 1990), but generally have high global warming potentials, so it is important to control the emissions of these gases. The UK was instrumental in fostering agreements at EU level for a new Regulation on certain fluorinated GHGs and a Directive relating to emissions from Mobile Air Conditioning systems in 2006 which ensure a two-step phase out of Mobile Air Conditioning that use fluorinated -gases with a GWP greater than 150, and the introduction of maximum annual leakage limits to cover the interim period before the phase out; as well as controls on refilling the retrofitting for these systems.

Furthermore the Government is considering new policies to address key sources of non-CO_2 emissions including, for example:

- A market based mechanism to facilitate trading of GHG reductions from agriculture, forestry and other land management sectors. These sectors accounted for around 8% of GHG emissions in 2004 (weighted by global warming potential);[53] and
- A competitive grant scheme, administered by the Coal Authority, to support projects aimed at controlling emissions arising from electricity production from coal mine methane (CMM), exempted from the Climate Change Levy in November 2003.

Benefits:

5.1.58 There are potentially strong scientific and economic arguments in favour of defining the UK's long term goal in terms of a multi GHG target and budget system. In particular, it would:

- capture approximately an additional 15% of the UK's overall impact on climate change (based on 2005 figures); and,
- incentivise the abatement of the least-cost GHGs, thus ensuring that greater reductions can be achieved for a given cost; Chapter 10 of the recent Stern Review identified this as a desirable feature of emissions reduction frameworks.

Costs:

5.1.59 There are a number of potential costs and risks associated with a multi gas approach, in particular:

- there are economic risks associated with the possible greater emphasis on non-CO_2 abatement in the short run; relatively less investment in CO_2 abatement might result in long term 'lock in'' to markets currently investing heavily in high fixed cost capital, such as electricity generation (although this risk should not be great, as the overall framework would still provide a clear signal of current and future GHG budgets and how these are made up); and,

[53] source: UK Climate Change Programme 2006, http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

- establishing a GHG target (e.g. at around 65% in 2050) might imply a UK view on the overall level of GHG emissions reductions required to achieve a desirable global stabilisation levels; this may be unhelpful given the preliminary nature of the current efforts to secure multilateral agreement on this issue.

5.2 Committee on Climate Change (Issue 6)

Issue 6: Would the establishment of an independent body with advisory functions on the optimum pathway to 2050, and apportionment of effort between sectors of the economy, improve the institutional framework for managing carbon in the economy (if adopting either Option 2 or 3 under Issue 1)?

Option 1	Option 2
No, all analysis should remain within Government	*Yes, with the Committee adding to and challenging Government's analysis*

5.2.1 There are potentially a number of different pathways to the proposed statutory targets in 2020 and 2050. The choice between these pathways is likely to impact on the overall costs of mitigation and the achievement of a range of other economic, social and policy objectives, as well as the UK's ability to show international leadership in climate change mitigation. Balancing these considerations is a complex and technical task – evaluating climate change costs and uncertainties is a rapidly developing area of research and one which requires highly specialised skills.

Option 1:

5.2.2 Under the first option the Government would determine and set the pathway towards the achievement of the 2020 and 2050 statutory goals, based on its own analysis of future emissions projections, dynamic abatement costs, and policy effectiveness. In the event that new systems of establishing carbon management objectives considered under Issue 1 are adopted, the Government would assume sole responsibility for evaluating the trajectory established.

Benefits:

5.2.3 The Government has well established resources, capabilities and experience for determining carbon management objectives based on assessments of expected relative costs and benefits. These could be readily adapted to a new framework at minimum resource costs.

Costs:

5.2.4 In establishing mitigation objectives, the Government needs to balance a range of different evidence from the scientific, academic and policy communities on the costs and benefits of action, factoring in the impacts on wider policy objectives such as maintaining secure energy supplies and promoting economic prosperity. The Government currently does this effectively, but the process by

which these decisions are made is not always transparent to those outside of the process. More importantly, Government publications are subject to Ministerial clearance, potentially affecting the perceived credibility of the analysis presented. This could potentially reduce the certainty for firms and households when forming expectations surrounding the impact of future policy on the incentives to invest in less carbon intensive capital and behaviours.

Option 2:

5.2.6 Under the second option, the Government would again set the pathway towards the achievement of the 2020 and 2050 statutory goals, in the same way as under the first option. However, it would first receive published advice from the Committee on Climate Change. This body would advise Government on the size of carbon budgets and therefore the detailed shape of the optimal trajectory towards the achievement of the 2020 and 2050 targets, based on detailed analysis of the dynamic costs and benefits of abatement. In forming its advice, the Committee would be required to consider a broad set of factors (which the Government itself would take into account when actually setting the budgets). These are outlined in paragraph 5.1.23. It is envisaged that this broad range of factors will ensure that the Committee's advice is comprehensive and does not seek to achieve emissions reductions at the expense of economic growth or other objectives.

5.2.7 As well as advising the Government on the optimal trajectory, the Committee would be required to advise the Government on:

- the balance of emissions reduction effort to be achieved overseas and domestically, which is relevant to Issue 3;
- the respective contributions towards meeting the budgets of those sectors covered by trading schemes, and other sectors;
- any use of banking and borrowing facilities (as outlined in Issue 4); and,
- any other issue on request from the Government, such as whether it should include other non-CO_2 GHGs in the framework, as outlined in Issue 5.

Benefits:

5.2.8 The establishment of a new independent body to advise on the pathway towards the achievement of the 2020 and 2050 statutory goals would have a number of key potential benefits. It would strengthen the institutional structure through which to improve the way the UK manages carbon in the economy by:

- increasing transparency surrounding the determination of a carbon abatement pathway (a process currently influenced by a range of different stakeholders in a way which is not always visible to the public); and
- ensuring broad and explicit representation from the academic and scientific communities in understanding the complex matrix of costs, benefits and risks associated with action to mitigate climate change.[54]

[54] It is intended that the Committee would be staffed by a highly analytical Secretariat, and a Board made up of members reflecting expertise in areas relevant to calculating the abatement pathway: economic analysis and forecasting; business competitiveness; financial investment; technology development and diffusion; energy production and supply; climate science; emissions trading; and climate change policy.

Costs:

5.2.9 There would be resource costs associated with the establishment of a new independent body to cover, for example remuneration and related costs of committee members and its secretariat, and the management of office facilities. These costs would be met from within the public spending allocation of DEFRA. Overall, these are expected to be in the region of £2.25m in the first year and £2m annually thereafter. Table 4 below provides a short break down of these expected costs.

Table 4: Outline of Estimated First Year and Ongoing Costs of Committee on Climate Change

Function	1st Year Costs*	Ongoing Annual Costs
Secretariat	830,000	820,000
Committee	270,000	460,000
Research Budget	750,000	500,000
Additional	150,000	175,000
Corporate Identity and Set up Costs	250,000	
Total	**2,250,000**	**1,955,000**

*1st Year costs reflect the fact that the Committee's secretariat and Board (Committee) will only be in place part-way through the year.

5.3 Enabling Powers

Issue 7 Should the Bill contain new powers to introduce trading schemes through secondary legislation?

Option 1	Option 2
No, new powers would require new primary legislation	*Yes*

5.3.1 The Stern Review outlined three broad mechanisms for establishing a carbon price (a key element of the recommended overall mitigation strategy), either: explicitly through direct taxation or the establishment of cap and trade schemes or, implicitly, through regulations such as energy performance standards. The choice of intervention is influenced by the particular market which a policy targets: each generic policy instrument (sometimes in combination) is appropriate in certain circumstances. The taking of powers to introduce trading schemes does not prejudge future policy decisions surrounding the most appropriate instrument in each particular market and time period.

5.3.2 The ease and legal foundations with which these interventions can be made by Government, in seeking to manage carbon emissions, differs for each mechanism. Changes in fiscal policy are already 'enabled' in the sense that they

can be made annually as part of the Finance Act. Similarly the Government is enabled to regulate building markets while the EU institutions largely regulate product markets. The Pollution Prevention and Control Act (1999) enables the Government to introduce trading schemes for large industrial sources of emissions within Great Britain.[55] However, it cannot be applied to establish schemes which:

- cover numerous small consumers, for example within heat and transport markets; or
- target sources of emissions at other points in the energy chain (e.g. fuel suppliers, end users of electricity).

Allowing the introduction of trading schemes across the economy through secondary legislation would reduce the lead-time for implementing these policies, which will add an important element to the policy mix for meeting the targets and budgets in the framework.

Option 1:

5.3.3 The Government would not take a power, in addition to those established in the Pollution Prevention and Control Act (1999), allowing the introduction of trading schemes on markets not covered by the EU-ETS which, either cover numerous small consumers, or target sources of emissions at different points in the energy chain. In the event that the Government wished to introduce such measures, it would be required to introduce further primary legislation to establish the necessary powers.

Benefits:

5.3.4 The Government already has some powers to make policy in markets affecting domestic emissions. For example, it has the power to levy taxation on energy supplies or establish regulations such as building standards. All new trading schemes would be subject to a higher level of scrutiny afforded by the primary legislation procedure.

Costs:

5.3.5 In the event that the Government wished to introduce trading schemes in markets not covered by the EU-ETS, the Government would be required to introduce further primary legislation to establish the necessary powers. This would require Government time and resources to prepare as well as Parliamentary time to approve it (which may not be available in necessary timeframes for decision making). Failing to take the opportunity to lift constraints to allow for the introduction of trading schemes in secondary legislation could increase:

- the volume of emissions reductions financed internationally (rather than achieved domestically potentially at lower cost);

[55] The IPPC Act does not extend to Northern Ireland. These powers have not been used for climate change measures to date as the UK emissions trading scheme was introduced as a voluntary mechanism and the EU-ETS was introduced using the European Communities Act. They will however be used in combination with powers in the European Community Act to introduce the proposed SO_2, NO_x and particulate trading scheme.

- the risk of Government needing to implement more expensive policy options (due to time constraints); and / or,
- the likelihood of needing to review the budget profile more fundamentally.

Option 2:

5.3.6 The Government would introduce new powers to enable a broader range of trading schemes to be implemented through secondary legislation. In developing such schemes, the Government would make a firm commitment to conduct a full public consultation and a full RIA on the detailed proposals, before making secondary legislation.

Benefits:

5.3.7 Powers to enable the Government to introduce trading schemes through secondary legislation increases the ability of Government to develop and strengthen the policy framework to better ensure budgets can be met. This is because, in the absence of such powers, the Government would be required to introduce further primary legislation to establish the necessary powers requiring Government time and resources to prepare as well as Parliamentary time to approve.

5.3.8 Taking powers now would reduce future pressures on the legislative programme by allowing the core building blocks of any scheme to be developed and scrutinised once rather than repeatedly in primary legislation.

Costs:

5.3.9 As outlined earlier, there are a range of mechanisms with which to establish a carbon price which also include the use of direct taxation and regulations such as energy performance standards. Taking such enabling powers could be perceived as prejudging future policy decisions surrounding the most appropriate instrument in each particular market and time period, although Government could mitigate this risk by clearly outlining its approach to using these powers and the principles it intends to be guided by.

5.4 Reporting

Issue 8: Who should be responsible for the primary reporting of the UK's progress towards its carbon management objectives (if adopting Option 2 of Issue 6)?

Option 1	Option 2
The Government	*The Committee on Climate Change*

Option 1:

5.4.1 The Government should be required to produce an annual report to Parliament on progress towards the legislated targets and budgets. The Government would have to produce, in addition to its annual progress report, a five-yearly report

detailing whether the UK had met its most recent carbon budget, following the release of the GHG emissions Inventory for the final year of the budget period (this Inventory constitutes the UK's official statistics on its emissions up to and including a specified year, and is submitted to the EU and UNFCCC annually, to fulfil the UK's international obligations).

Benefits:

5.4.2 The Government is already legally required to produce an annual assessment of its progress on GHG emissions reductions, under Article 2 of the Climate Change and Sustainable Energy Act 2006.[56] This option therefore places no additional burden on the Government.

Costs:

5.4.3 It is envisaged that there would be a very small administrative cost involved in submitting an additional statement each year confirming whether a budget period had been met.

Option 2:

5.4.4 The Committee on Climate Change should produce an independent assessment of the UK's progress to achieving its targets and budgets, in an annual report to Parliament. The Government should produce a response to the Committee on Climate Change's report each year, also to Parliament. In addition, every five years, following the release of the final, validated data to show emissions in the last year of a budget period,[57] the Committee on Climate Change report should include a comprehensive assessment report on whether the budget was actually met, and the implications of this for current and future actions to stay on track to meet the legislated targets.

Benefits:

5.4.5 Involving the Committee on Climate Change in the annual reporting process would increase the independence and credibility of the reporting framework because:

- the Committee on Climate Change would publish independent advice and analysis on progress towards budgets and targets; and,
- the Government would be required to respond explaining, where necessary, why the advice of the Committee on Climate Change has not been adopted.

5.4.6 This would give the Committee on Climate Change a primary function in reporting on progress towards meeting the budgets and targets, maintaining a consistent approach regardless of the Government of the day, while strengthening Parliamentary accountability.

Costs:

5.4.7 The cost of the Committee on Climate Change monitoring the Government's progress would be marginal given that the Committee would necessarily have a

[56] Available from: http://www.opsi.gov.uk/ACTS/acts2006/20060019.htm

[57] Due to the international reporting framework there is a two-year15 month time lag on the publication of this final, validated data. Hence for the 2008-12 budget period the comprehensive assessment report final data would be published in spring 2014.

Secretariat tasked with doing analysis and assisting the Government in various matters (see costs assessed under Issue 6).

Issue 9: Should the Government be required to report its assessment of the risks of the impacts of climate change for the United Kingdom, and on its policies and proposals for adapting to climate change?

Option 1	Option 2
Yes, as a statutory duty	No, the Government would not be required by law to report on adaptation.

Option 1:

5.4.8 The Government should be required to produce a regular report to Parliament. It is intended that this will be at least every five years, with the option for more frequent reporting.

Benefits:

5.4.9 There are currently no legal requirements on the Government to report on or monitor the risks of climate change and the progress the Government is making in adapting to these risks, but there is growing recognition of the need for a more coherent approach[58]. A statutory duty to report on adaptation makes more certain this and future Government's intentions to acknowledge the risks imposed by climate change for the UK, and address these risks through a coherent strategy. A statutory reporting requirement allows a public examination of the Government's work in this area, without imposing prescriptive measures that risk constraining adaptation activities or even leading to mal-adaptation as understanding of climate science and the economic situation develops. A Government report to Parliament would allow this flexibility whilst ensuring full public scrutiny and examination of the measures being taken.

Costs:

5.4.10 The new statutory duty placed on Government would present a relatively small increased resource burden.

Option 2:

5.4.11 The Government would not have a statutory duty to report on adaptation, but may do so as it sees fit. It is likely to minimise additional resource costs, as the reporting function could be avoided if deemed too resource-heavy.

[58] The overwhelming response to a Government consultation in 2005 on the development of an adaptation policy framework was that this would be useful in helping to co-ordinate adaptation action, both at local level and across Government. It was also felt that the time was right for a national framework to provide strategic direction, outline priority areas for action and develop methods for trying to avoid cross-sectoral inconsistencies

Benefits:

5.4.12 This is a more flexible approach, allowing the Government to report as and when it deems this appropriate.

Costs:

5.4.13 A non-statutory reporting framework lacks the certainty provided by a statutory requirement, which ensures that this and future Government's have a duty to report on and therefore show that they are addressing adaptation.

Section 5.5 Appraisal of the proposed legislative framework

5.5.1 In deciding its approach in relation to each of the issues set out above, the Government is intending to strike the best balance possible between the certainty needed to support the transition to a low carbon economy, while at the same time incorporating sufficient flexibility to help maintain the framework's ability to deal with contingencies and thereby keep economic costs and other negative impacts to a minimum. This is how the Government has arrived at the proposed package of measures, namely:

- Issue 1 – Statutory targets for 2050 and 2020, and five year carbon budgets;
- Issue 2 – Ability to review budgets and targets as a result of significant developments in relevant circumstances;
- Issue 3 – Emissions reductions overseas to count towards the targets and budgets;
- Issue 4 – Banking and limited borrowing between budget periods;
- Issue 5 – CO_2 emissions reduction targets in the Bill, with the possibility of coverage of non-CO_2 GHGs at a later stage;
- Issue 6 – Establishment of a Committee on Climate Change;
- Issue 7 – New powers to introduce trading schemes;
- Issue 8 – Annual reporting on progress by the Committee on Climate Change;
- Issue 9 – Regular Government reporting on adaptation.

5.5.2 This package includes appropriate checks and balances surrounding the proposed flexibility mechanisms in the framework, in order to minimise their impacts on uncertainty, in particular:

- amendments to targets and budgets are permitted, but only when significant developments occur;
- the review of budgets or targets will be subject to Parliamentary scrutiny and, in the case of carbon budgets. This may only proceed once the advice of the Committee on Climate Change has been considered;
- the ability to count overseas credit purchases towards the target will be subject to the UK's international legal obligations; and,
- the use of banking and limited borrowing between budget periods is subject to the advice of the Committee on Climate Change, and a strict limit of 1% on inter-budgetary borrowing.

5.5.3 The system of long-term statutory targets and five-year budgets in the context of an annual reporting framework on mitigation, and a regular reporting framework

on adaptation, will provide certainty in terms of the direction of travel and progress to date. The independent Committee on Climate Change will help improve the transparency of this process, both in terms of its advice to Government and its annual reporting duties.

5.5.4 The proposed new powers to enable the potential introduction of trading schemes through secondary legislation, will help ensure the Government has the capacity to implement the full range of policies to deliver the targets and budgets in the most cost effective manner (and subject to detailed impact studies).

6. Small Firms Impact Test

6.1 The Government has conducted preliminary discussions with the Small Business Service at the DTI as well as the Federation of Small Businesses. In addition, it has taken account of past submissions on relevant policy issues. It invites further input as part of the consultation exercise which will inform the subsequent development of a full and final RIA.

6.2 The Government recognises that small business account for significant quantities of emissions. For example, the Carbon Trust identified that small and medium-sized enterprises (SMEs) with less than 50 employees in manufacturing sectors or 250 employees in service sectors accounted for approximately 37MtCO_2 of emissions in 2002. In addition, it identified a total cost effective abatement potential of approximately 7.9% (based on a 15% discount rate).[59]

6.3 In delivering the proposed statutory objectives, it is likely that SMEs will be affected potentially by both specifically targeted measures as well as wider policies, such as the Renewables Obligation, designed to reduce the carbon intensity of key energy services. These are likely to raise the costs of energy, with subsequent risks to output and employment. However, these risks are likely to be very limited in the case of service sector SME's, which typically incur a low ratio of energy to total costs, and reduced more generally through the promotion of greater resource efficiency.

6.4 The Government recognises that, in designing and implementing policies designed to tackle SME emissions directly (or more general polices affecting this sector), it needs to take account of their often limited capacity to meet detailed or complex compliance requirements. For example, it has taken care to ensure the exemption of small emitters from current emission trading schemes. The development of any future policies will be the subject of detailed impact assessments which will include analysis of impacts on small firms.

[59] The Carbon Trust: The UK Climate Change Programme: Potential evolution for business and the public sector

6.5 The Small Business Service was provided with a copy of these draft proposals prior to public consultation, and acknowledged our approach and findings.

7. Competition Assessment

7.1 This partial RIA does not include a Competition Assessment. This is because the proposals contained within this draft Bill do not provide for the specific policies and, therefore, the specific impacts on competition within individual markets cannot be considered. However, a discussion of generic distributional issues is included in Section 4.4.

8. Enforcement, sanctions and monitoring

8.1 Minor adjustments to the timing of emissions reductions, in the form of banking and limited borrowing proposed under Issue 4 (Section 5.1), would be subject to advice from the proposed Committee on Climate Change. Any use of the wider review clauses enabling the Government of the day to revise the statutory targets or budgets in the event of significant developments in relevant circumstances (outlined in detail in paragraph 5.1.23), would be subject to Parliamentary approval under an affirmative resolution procedure.

8.2 Responding to climate change is an increasingly high priority of households, firms and elected representatives. In this context, it is likely that any Government which failed to deliver a target or budget would be exposed to a high degree of political pressure to respond in an appropriate way. In addition, the Government would be exposed to the possibility of Judicial Review. In such instance, the Government could be required to take remedial action by order of court.

8.3 These proposals give the Committee on Climate Change a primary function in reporting on progress towards meeting the budgets and targets, maintaining a consistent approach regardless of the Government of the day. Requiring the Government to respond to the Committee's annual report ensures that Parliament and the public are able to monitor policy in this area and that the Government can be held to account annually in Parliament.

9. Implementation and delivery plan

9.1 It is intended that the Climate Change Bill will be introduced as soon as Parliamentary time allows following the pubic consultation process and pre-legislative scrutiny, and we intend that the provisions in the final Bill (as intended in this draft), will come into force in Spring 2008. The following milestones are then envisaged:

- the Committee on Climate Change will lay a report before Parliament, recommending to the Government the level of the first three carbon budgets, for the periods 2008-12, 2013-17 and 2018-22 by 1 September 2008;
- the Government will set the level of these carbon budgets in secondary legislation, following a Parliamentary process (Order requiring affirmative resolution); it must set these budgets by 31st December 2008;
- the Government will, at the same time, publish a strategy explaining its policies and proposals for keeping within the budgets that it has set;
- the Government will be required to set the next budget, for the period 2023-28, in secondary legislation following further advice from the Committee on Climate Change, by 30th June 2011 (at least 11.5 years before the start of the 2023-28 budget period), again publishing a strategy outlining how it intends to keep within the budget; and,
- subsequent budgets will be set in the same way, in each case at least 11.5 years before the start of the budget period.

10. Post implementation review

10.1 The post-implementation review will focus on the UK's performance towards meeting its legislated carbon budgets and targets, and will be ongoing, as detailed in the reporting requirements of the Bill. Specifically this means that the following reviews will be required:

- an annual report by the Committee on Climate Change, laid before Parliament, assessing the UK's performance and progress towards achieving its legislated targets and budgets. The first report will be due by 30th June 2009;
- a Government response to the Committee's annual report, laid before Parliament by 15th October 2009;
- a repetition of this process by the same dates of each subsequent year; and,
- in the Committee's annual report for 2014 (when all of the relevant data for the first budget period becomes available) a statement of its views on the manner in which the Government carried out its functions in relation to meeting its legislated budget for the period 2008-12; this statement will then be repeated after each budget period, when all data for that budget becomes available – in 2019, 2024, 2029 etc.

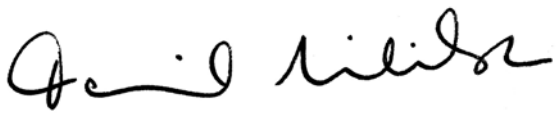
10.2.1 The post-implementation review will evaluate performance against a number of key measures of success, in particular focusing on:

- the impact of the framework on emissions of carbon dioxide;
- the impact of the framework on investment in R&D and diffusion of low-carbon technologies across all sectors of the UK;
- the costs and benefits of the chosen emissions reduction pathway (in the context of a range of potential alternatives); and,
- progress towards the achievement of deeper cooperation as part of the UNFCCC and EU-ETS processes.

11. Declaration and publication

I have read the Regulatory Impact Assessment and I am satisfied that the benefits justify the costs

Signed:



Date: 9 March 2007

Rt. Hon David Milliband, Secretary of State for Environment, Food & Rural Affairs, Department for Environment, Food and Rural Affairs

Annex A: Outlining Secondary Effects of Mitigation Policies

A1. Driving domestic abatement is likely to deliver a range of secondary effects (many of which are likely to be positive). These potentially include:

- improved public health;
- increased energy security; and
- reduced fuel poverty (in the case of some energy efficiency policies).

A2. Factoring in these benefits has the potential substantially to reduce mitigation costs. The Stern Review, for example, found that including co-benefits could reduce the overall costs of mitigation through global action by 1% of GDP. In addition, the IPCC indicated that global ancillary benefits may be of the order of 30 to 100% of abatement costs.[60] These secondary effects are likely to influence the desirable balance of direct emissions reductions *in* the UK versus mitigation purchased *by* the UK but implemented overseas (referred to as 'effort'). This is discussed as part of Issue 3.

A3. It may be useful to consider both quantitative and qualitative evidence of secondary effects associated with existing policies to reduce UK emissions. Quantitative assessments are dominated by impacts on human health arising from changes (usually reductions) in the level of air pollution: combustion of fossil fuels, particularly coal, raises the level of particulates such as SO_x (oxides of Sulphur), and NO_x (oxides of nitrogen) in the atmosphere. DEFRA has estimated that 80% of ancillary benefits of UK abatement arise from health benefits associated with reduced air pollution.[61]

A4. The Evaluation Synthesis Report undertaken as part of the Climate Change Programme Review (CCPR) evaluated the costs and benefits of existing policies by sector both with and without these secondary effects. The results of quantitative analysis (mainly of health effects) are summarised in the Figure A below. It shows that the positive health effects increased the net benefits of Climate Change Programme policies affecting agriculture, land use and farming and, to a lesser extent, domestic and business sectors. However, policies targeting transport efficiency increased demand and congestion and resulted in larger costs. Further qualitative research conducted as part of the CCPR identified generally positive effects on energy security, innovation, and fuel poverty arising from this suite of policies.[62]

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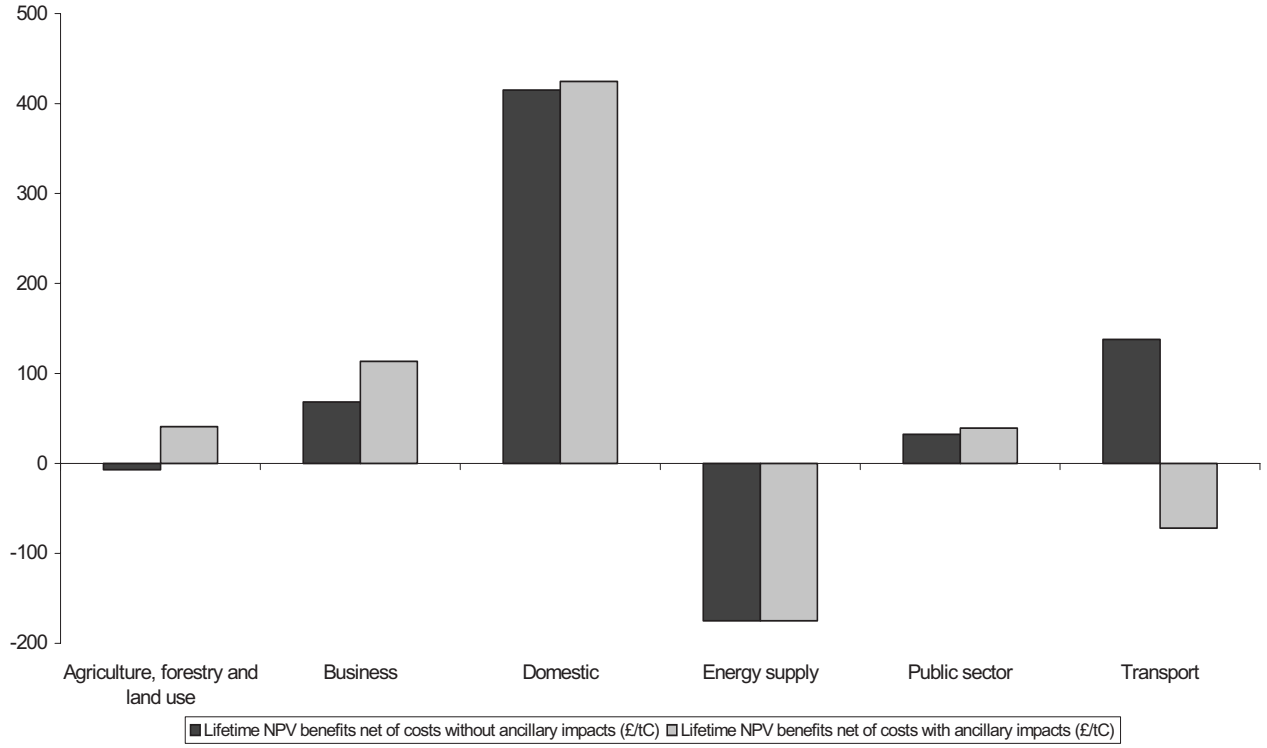
[60] IPCC 3rd assessment report.

[61] Ancillary Effects of Green House Gas Mitigation Policies: A paper by DEFRA October 2002. Other studies indicate substantial benefits of mitigation policies. For example, Pearce (1996) highlighted studies from the UK and Norway showing benefits of reduced air pollution offset the costs of carbon dioxide abatement costs by between 30% and 100%. Analyses carried out under the Clean Air for Europe programme suggest cost savings as high as 40% of GHG mitigation costs are possible from the co-ordination of climate and air pollution policies. In addition, a recent study by the European Environment Agency showed that the additional benefits of an emissions scenario aimed at limiting global mean temperature increase to 2 degrees centigrade would lead to savings on the implementation of existing air pollution control measures of €10 billion year in Europe, and additional avoided health costs of between €16-46 billion per year.

[62] Taken from the Evaluation Synthesis Report, Climate Change Programme Review 2006.

Figure A[63] Impact of secondary health effects on policy cost-effectiveness (benefits net of costs per tonne of carbon saved), by source (£/tCe)



A5. It is likely that further ancillary benefits will be derived from future policies. However, as indicated from the analysis outlined above, the extent of such future ancillary effects is highly policy dependent. As such, the potential effects of implementing the proposed carbon management framework are not analysed in detailed (given that it does not prescribe for the particular suite or balance of policies). However, policies proposed as part of the forthcoming Energy White Paper 2007 will include assessments of the expected (or likely ranges of) secondary effects.

[63] Evaluation Synthesis Report, Climate Change Programme Review 2006, pages 26-27.

Annex B: Glossary of Terms and Abbreviations

Annex I Countries	Definition for Kyoto Protocol. Industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States
CCPR	UK Climate Change Programme Review
Clean Development Mechanism (CDM)	The project mechanism provided for under Article 12 of the Kyoto Protocol. These are projects in developing countries which reduce emissions of greenhouse gases or enhance sinks.
CO_2	Carbon Dioxide.
CO_2e	Carbon Dioxide equivalent: an internationally accepted measure of Global Warming Potential (GWP) of greenhouse gases (GHGs). The CO_2e of represents the amount carbon dioxide with the same global warming potential (GWP), as a single ton of the GHG.
DTI	Department of Trade & Industry
EU	European Union
EU-ETS	European Union Emissions Trading Scheme.
EWP	Energy White Paper
G8	Group of 8 of the world's major industrialised economies (Canada, France, Germany, Italy, Japan, Russia, UK, USA), with the European Commission also represented at meetings.
GDP	Gross Domestic Product
GHGs	Green House Gas(es). There are six Greenhouse Gases (GHGs) that concerns UNFCCC and Kyoto Protocol • Carbon Dioxide (CO_2) • Methane (CH_4) • Nitrous Oxide (N_2O) • Hydrofluorocarbons (HFCs) • Perfluorocarbons (PFCs) • Sulphur Hexaflouride (SF_6) While, Chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs) are also greenhouse gases but are being phased out under the Montréal Protocol. The UNFCCC and the Kyoto Protocol are concerned with greenhouse gases not covered by the Montreal Protocol.
Gleneagles Dialogue	Forum for participating countries to work together on the shared challenges of addressing climate change, energy security and access to energy. The Dialogue also oversees implementation of the Gleneagles Plan of Action, which aims to increase the speed with which we reduce greenhouse gas emissions.
Global Warming Potential (GWP)	Global Warming Potential a GHG, expressed in terms of the amount of CO_2 with equivalent the greenhouse gas effect, over a specified timescale, usually 100 years, as the ton of the GHG.

	Source: Third Assessment Report of the IPCC (2001)
IEA	International Energy Authority
IPCC	Intergovernmental Panel on Climate Change: A UN body set up to "*assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.*" For further details please see: http://www.ipcc.ch/
ITEA	International Emissions Trading Association
Joint Implementation (JI)	The project mechanism provided for under Article 6 of the Kyoto Protocol. These are projects undertaken in developed countries with targets which reduce emissions of greenhouse gases or enhance sinks.
Kyoto Protocol	The Kyoto Protocol to the UNFCCC. Negotiated in Japan in 1997, it came into force in February 2005. Among other things, the Protocol sets binding targets for the reduction of greenhouse gas emissions by industrialized countries.
Macroeconomic analysis	Analysis that considers impacts on all the sectors of the economy
MARKAL MACRO	Macro economic model that incorporates UK Macro model with feedback mechanisms to change demand in light of changes in the energy.
Marrakech Accords	Agreements reached in 2001 which set out the detailed provisions building on provisions of the Kyoto Protocol, including those relating to supplementarity, CDM and JI.
ppm	Parts per million: measurement of atmospheric concentration of greenhouse gas.
RIA	Regulatory Impact Assessment
Stern Review	A recent review lead by Sir Nicholas Stern on the economics of climate change. See the Treasury's website - http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm
Supplementarity	The principle that the use of the project mechanisms should be supplemental to domestic action to reduce greenhouse gas emissions.
UK MARKAL	"Bottom up" model of the UK Energy System over time
UNFCCC	United Nations Framework Convention on Climate Change. 189 countries around the world have joined this international treaty that sets general goals and rules for confronting climate change. The Convention sets an ultimate objective of stabilizing greenhouse gas emissions "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system." As a "framework" document it is something to be amended or augmented over time. Further information is available from: http://unfccc.int

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