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Climate Change Bill [HL]

Bill 97 of 2007-08

This Bill contains provisions to create a legally binding target of carbon dioxide emission reductions for the UK of at least 26% by 2020 and 60% by 2050 compared to 1990 levels.

Key features of the Bill include provisions to require the Government to publish five yearly carbon budgets as from 2008 and create a Committee on Climate Change to advise on the levels of carbon budgets to be set. The Bill also places a duty on the Government to assess the risk to the UK from the impacts of climate change and provides powers to establish trading schemes for the purpose of limiting greenhouse gases.

On other matters it includes powers to create waste reduction pilot schemes and amend the provisions of the *Energy Act 2004* on the renewable transport fuel obligations.

The Bill extends to the whole of the UK.

Elena Ares

SCIENCE AND ENVIRONMENT SECTION

Contributions from: Paul Bolton, Social and General Statistics Section; Edward White and Louise Smith, Science and Environment Section.

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Summary of main points

The UK Government has a target of reducing carbon dioxide emissions by 20% by 2010 and 60% by 2050. This was originally set out in the UK Climate Change Programme. Following an NGO campaign with support of the Opposition Parties to make emission reduction targets legally binding, a Climate Change Bill was announced in the Queen's Speech in November 2006.

A draft version of the Bill was published in March 2007. A Joint Committee of the two Houses, chaired by Lord Puttnam, considered the Draft Bill and published its conclusions in July 2007. The Draft Bill was also scrutinised by the Environmental Audit Committee and the Environment, Food and Rural Affairs Committee.

The Bill was presented in the House of Lords in November 2007. It is due to have its Second Reading in the House of Commons on 9 June 2007.

The main provisions of the Bill are as follows:

- **Setting emissions reduction targets in statute and carbon budgeting**. Legally binding targets for carbon dioxide emissions of 26% by 2020 and 60% by 2050 are included in the Bill. Also included are proposals for five-yearly carbon budgets.
- **The creation of an independent advisory body**. The Bill would create the Committee on Climate Change, to advise the Government and devolved administrations on how to reduce emissions over time and across the economy. The Committee will advise on whether the 2050 target should be increased and on the setting of the five-yearly budgets.
- **Reporting framework.** The Bill provides for a system of annual reporting by the Government on the UK's greenhouse gas emissions. The Committee on Climate Change will have a specific role in reporting annually on progress, with the Government required to lay before Parliament a response to this progress report.
- **Trading schemes.** The Bill includes new powers to enable the Government and the devolved administrations to introduce new domestic trading schemes to reduce emissions through secondary legislation.
- **Adaptation**. The Bill sets out a procedure for assessing the risks of the impact of climate change for the UK, and a requirement on the Government to develop a climate change adaptation programme on matters for which it is responsible. The Bill also gives powers to direct other bodies to prepare risk analyses and programmes of action.

There were a significant number of opposition and Government amendments to the Bill in the Lords. These included amendments to: make the principal aim of the Bill to limit UK greenhouse gas emissions to levels that would contribute to limiting global temperature increases to 2oC; increase the robustness of the proposed reporting structures; clarify the role of the Committee on Climate Change; create an adaptations sub-committee within the Committee on Climate Change; make provisions for the inclusion of emissions from shipping and aviation; and strengthen emissions reporting requirements for large businesses.

The Bill extends to the whole of the UK.

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I Background

A. The UK Climate Change Programme

The UK Climate Change Programme has been ongoing since 1994. The target set in the first Programme by the previous Government was for emissions to return to 1990 levels by 2000. The current Government first set out its Programme in 2000, reviewed it in 2004, and published a new version in 2006. The 2000 Programme set out how the UK Government intended to meet its Kyoto target of reducing greenhouse gas emissions by 12.5% by 2012 compared to 1990 levels, together with its domestic target of reducing carbon dioxide emissions by 20% by 2010:

> The Government's priority is to deliver the UK's legally binding target under the Kyoto Protocol but it believes that greater reductions in emissions are feasible, and that there will be real advantages to the UK in aiming to achieve them. That is why the Government and the devolved administrations have agreed a separate domestic goal of reducing carbon dioxide emissions to 20% below 1990 levels by 2010. This will ensure that the UK continues to lead by example on climate change and starts to make the transition to a lower carbon economy[1]

The 2000 Programme already made clear in its summary that as a 60% cut in emissions was likely to be the minimum required in the longer term "the Kyoto Protocol is only the first step. In the longer term, bigger cuts worldwide – perhaps 60% or more – will be needed."[2] This figure was echoed in the Royal Commission on Environmental Pollution's 22nd report, *Energy - The Changing Climate,* which concluded:

> The government should now adopt a strategy which puts the UK on a path to reducing carbon dioxide emissions by some 60% from current levels [1997] by about 2050. This would be in line with a global agreement based on contraction and convergence which set an upper limit for the carbon dioxide concentration in the atmosphere of some 550 ppmv and a convergence date of 2050.[3]

The 2000 Programme set out the estimated impacts of proposals put forward to tackle UK emissions. They would:

> deliver the UK's legally binding target under the Kyoto Protocol. It could cut our greenhouse gas emissions by an estimated 23% below 1990 levels by 2010. This means that carbon dioxide emissions alone could be reduced by an estimated 19% below 1990 levels by 2010. Together with policies where the impact has not been quantified, this could also achieve the domestic goal.[4]

However, it became increasingly clear over the next five years that that the domestic target set for 2010 of 20% reduction in emissions is unlikely to be achieved. This was

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1 Department of the Environment, Transport and the Regions (DETR), Climate Change: The UK Programme, November 2000
2 ibid, Summary
3 Royal Commission on Environmental Pollution's 22nd report, *Energy - The Changing Climate*, 2000
4 DETR, Climate Change: The UK Programme, November 2000

acknowledged by Margaret Beckett, the then Secretary of State for the Environment, in March 2006 when the latest Programme was published;

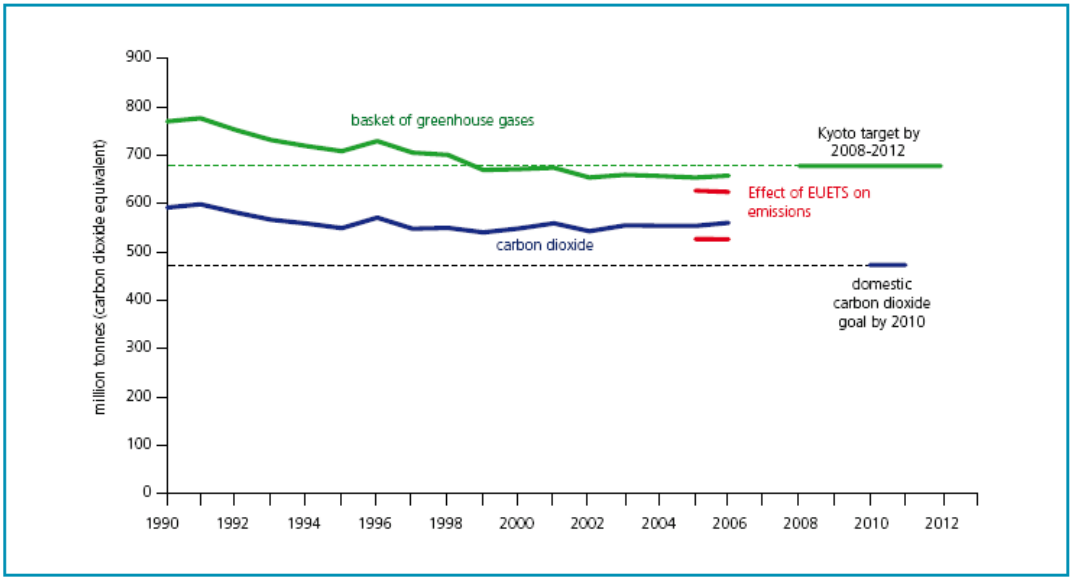
> These policies are expected to reduce the UK's emissions of the basket of greenhouse gases to 23-25 per cent below base year levels, around twice our commitment to reduce emissions under the Kyoto Protocol. It is also expected to reduce the UK's carbon dioxide emissions to 15-18 per cent below 1990 levels by 2010. The review, and policies introduced already, could reduce carbon emissions by 7-12MtC by 2010. This would take the Government close to its domestic target of a 20 per cent reduction by 2010. The Government still believes that the UK can achieve this target. This is an on-going process and the Government will in future report annually to Parliament on emissions, future plans and progress on the domestic climate change agenda. We believe we can reach the 20% target with support from all sections of the economy and society, not least by the collective action of individuals.[5]

The difficulties with meeting the 2010 target also called into question the Government's ability to meet the further target, stated in the 2006 Programme, to reduce carbon dioxide emissions by 60% by 2050. The first annual report to Parliament on progress was published in July 2007:

> Provisional estimates show that the UK's carbon dioxide emissions during 2006 were around 560.7 million tonnes, about 5¼ per cent lower than the 1990 level. This is around 1¼ per cent or about 6.5 million tonnes higher than the 2005 figure.

The increase was primarily because of fuel switching from natural gas to coal for electricity generation. Details of UK emissions since 1990 are set out in the graph below.

UK greenhouse gas emissions 1990–2006 (2006 results are provisional) including effect of ETS[6]



5 Written Statement, HC Deb 28 March 2006 c57WS
6 Defra, UK Climate Change Programme, Annual Report to Parliament, July 2007

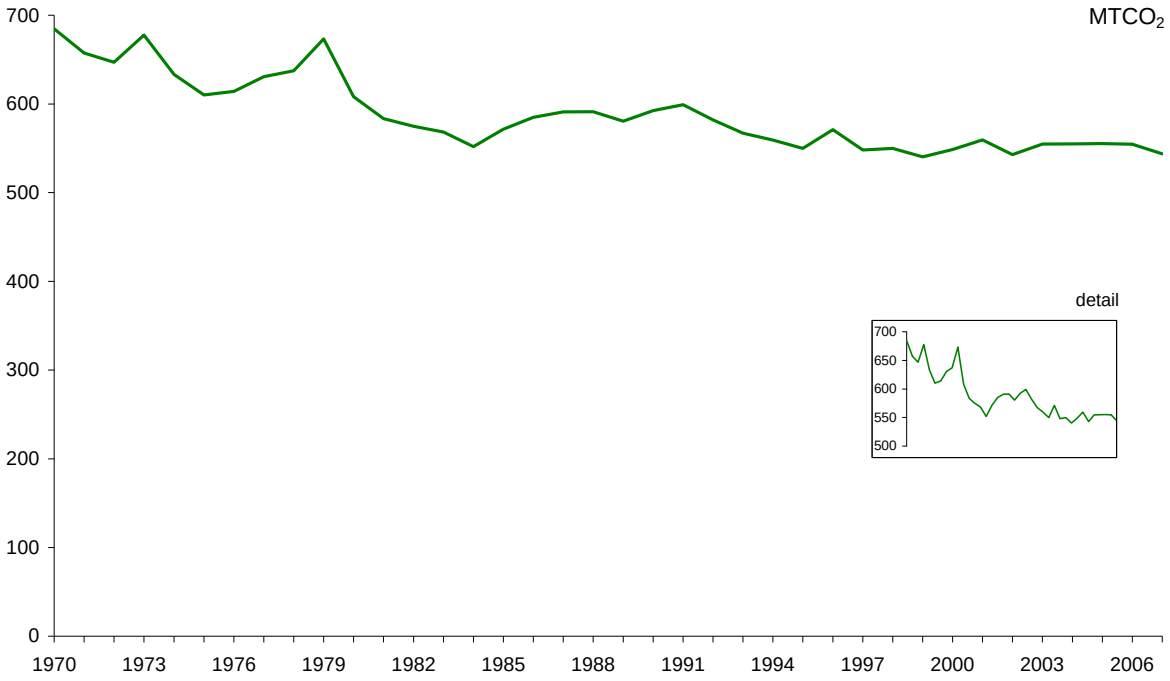
B. Summary of emission statistics

1. United Kingdom

a. Carbon Dioxide

UK emissions in 2007 have been provisionally estimated at 544 million tonnes of CO_2.[7] The chart below gives trends since 1970. Putting aside the year-on-year variability they show a steady decline between 1979 and the mid 1990s. This reduction was mainly associated with the displacement of coal in electricity generation by gas and nuclear power and the decline in emissions from industry. There have been annual variations in emissions since the mid-1990s, but no clear trend up or down.

Estimated UK carbon dioxide emissions since 1970



Energy supply was the major source of emissions in 2006 with almost 40% of the total; road transport was next largest with almost 25%, followed by business and residential with 17% and 15% respectively. If the energy supply sector emissions are reallocated to the consuming sectors then the business and residential sectors increase their share due to their electricity use. Overall business was ultimately responsible for 35%, transport 28% and the residential sector 27%. End user emissions from the residential sector of 149 $MtCO_2$ were an average of 2.5 tonnes of CO_2 per person and 6.0 tonnes per household.[8]

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7 *Carbon dioxide emissions and energy consumption in the UK*, Energy Trends special feature March 2008, BERR

8 Mid -2006 population estimates and 2006 estimate of household numbers. http://www.statistics.gov.uk/

Projections

The most recent greenhouse gas emission projections were published by the (then) DTI alongside the Energy White Paper in May 2007.[9] There is much uncertainty about savings from these policies and their timing, so three alternatives are given –low, central and high carbon savings. The central results are summarised below:

Summary of CO_2 projections -central fuel prices and central savings from White Paper proposals

	UK total		Including EU ETS allowances purchased from abroad	
	$MTCO_2$	Change from baseline	$MTCO_2$	Change from baseline
1990	592.1	-	592.1	-
2005	554.2	-6.4%	527.2	-11.0%
2010	529.5	-10.6%	497.6	-16.0%
2020	484.7	-18.1%	463.8	-21.7%

Source: Updated energy and carbon emissions projections –The Energy White Paper. May 2007, DTI

This shows that even with the inclusion of EU Emissions Trading Scheme allowances purchased from abroad the UK is projected to fall short of its 2010 domestic target of a 20% cut. The 2020 figure, on these central estimates, of a 22% cut is outside the proposed carbon budget covering 2020 which would require cuts of at least 26%.

The range of projections from high to low savings from policy proposals show that with (then) current policies only the high estimate of policy savings gives a 2020 emissions figure that is just within the proposed carbon budget. Under the most optimistic projections the 2010 domestic target is not met until 2015, under the least optimistic it is not met until 2020. The gap between the low and high policy savings scenarios in 2020 is just over 35 $MTCO_2$.

a. All greenhouse gases

The UK's commitment under the Kyoto Protocol is to reduce the basket of greenhouse gas emissions by 12.5% relative to the 1990 level over the period 2008-2012.[10] Trends since 1990 are illustrated in the next chart.

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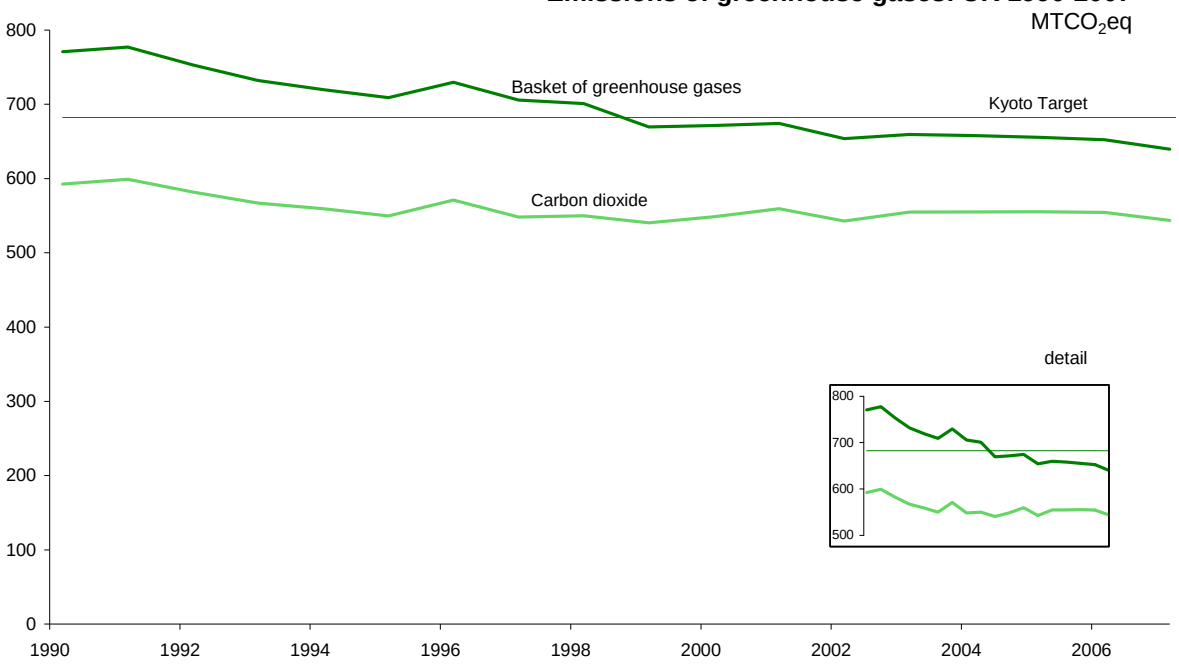
9 *Updated energy and carbon emissions projections –The Energy White Paper. May 2007*, DTI.

10 The actual base year for the F-gases is 1995, this is combined with emissions of the other gases in 1990 to give the Kyoto baseline total. This is referred to in this paper as the 1990 baseline. As mentioned earlier the geographical coverage includes the Crown Dependencies and Overseas Territories.

Emissions of greenhouse gases: UK 1990-2007



Source: *e-digest of environmental statistic* s, climate change table 4, Defra

Emissions fell steadily during the 1990s, but latterly the rate of decline has slowed and the trend has been flat for the last four years. When compared to CO_2 emissions alone the fall since 1990 was faster and lasted for a longer period. Emissions fell below the Kyoto target level in 1999 and have remained below it ever since. Estimated emissions of the Kyoto basket of gases in 2007 were 18.0% below the baseline.[11] This reduction is likely to increase when 2007 purchases of EU ETS emission allowances from abroad are included.

Further details on UK emissions can be found in Appendix 1 at the end of the paper

2. International greenhouse gas emissions

Global emissions of the Kyoto basket of greenhouse gases were estimated to have increased by around 70% (CO_2 equivalent) between 1970 and 2004; from 28,700 to 49,000 $MTCO_2$-eq. The increase was 24% between 1990 and 2004; a very slightly slower annual average increase. CO_2 emissions grew by around 80% between 1970 and 2004 compared to increases of 40% for methane and 50% for Nitrous Oxide. [12]

[11] *UK Climate change sustainable development indicator: 2007 greenhouse gas emissions, provisional figures,* Defra

[12] *IPCC Fourth Assessment Report -Working Group III Report "Mitigation of Climate Change"*, IPCC. Chapter 1

Estimated CO_2 emissions from fossil fuel combustion by region are summarised opposite. Asia contributed just over one-third of total emissions in 2005; both North America and Europe contributed around one-quarter each. Emissions from all other regions were below 5% of the world total.

Carbon dioxide emissions from fuel combustion in 2005, by region

	$MTCO_2$	% of world total
World	**27,136**	-
By Region		
Asia	9,355	34%
North America	6,755	25%
Europe[(a)]	6,645	24%
Of which EU 27	*3,976*	*15%*
Middle East	1,238	5%
South/Central America	938	3%
Africa	835	3%
Oceania	412	2%
International aviation and marine bunkers[(b)]	959	4%

(a) Includes all countries of the former USSR

(b) Emissions from international aviation and shipping are not asigned to any geographical region, but are included in the transport figures.

Source: CO2 Emissions from Fuel Combustion 1971-2005, 2007 edition, IEA

Between 1971 and 2005 emissions from the Middle East increased almost ten-fold; faster than any other region. Emissions from Asia increased almost five-fold and those from North America and Europe increased by 43% and 12% respectively. Europe was the only region where emissions fell between 1990 and 2004. This was due to the large fall from the former Eastern Bloc countries. Emissions from the rest of Europe increased slightly if these states are excluded. [13]

b. Individual countries

Total emissions from the twelve largest source countries are listed opposite. The US and China clearly dominated emissions (on this definition) in 2005 with 40% of global emissions. When combined the countries listed in the table produced just over two-thirds of global emissions.

CO_2 emissions from fossil fuels 2005

	Total		tonnes per capita	kg/2000 $US PPP
	million tonnes	% of world		
US	5,817	21.4%	19.6	0.53
China	5,101	18.8%	3.9	0.63
Russia	1,544	5.7%	10.8	1.12
Japan	1,214	4.5%	9.5	0.35
India	1,147	4.2%	1.1	0.34
Germany	813	3.0%	9.9	0.38
Canada	549	2.0%	17.0	0.55
UK	530	2.0%	8.8	0.31
Italy	454	1.7%	7.8	0.30
Korea	449	1.7%	9.3	0.47
Iran	407	1.5%	6.0	0.84
Mexico	389	1.4%	3.7	0.40
World	**27,136**	-	**4.2**	**0.50**

Source: CO2 Emissions from Fuel Combustion 1971-2005, IEA

c. Kyoto Protocol targets

The overall combined target for parties to the Kyoto Protocol is a 5% reduction against the 1990 baseline by 2008-2012. Individual targets vary from +10% for Iceland to -8% for the EU15 and some other European states. Under the system of burden sharing the EU15 members have individual targets that, if met, would meet the overall EU15 target of an 8% cut. These individual targets vary from -28% for Luxembourg to +27% for Portugal.[14]

Between the baseline and 2005 the aggregate emissions of Parties to the Protocol fell by 14.7%. This overall decline masked much variation; there were cuts of 30-50% in many former Eastern Bloc states and increases of over 40% in Spain, Portugal and Turkey. EU15 emissions in 2005 were 1.5% below the baseline. Much of the overall decline has been in

13 *CO_2 Emissions from Fuel Combustion 1971-2005, 2007 edition*, IEA

14 *Kyoto Protocol targets*, UNFCCC

the so-called 'Economies in Transition'. Their emissions generally stopped falling towards the end of the 1990s and the total emissions of all Kyoto Parties increased by 3.0% between 2000 and 2005.[15] [16]

Projections

THE IPCC has summarised the various different projections of global greenhouse gas emissions. The projections to 2030 (compared to 2000) are for increases ranging from 25-90%. These assume no additional policies to reduce emissions. Within this, CO_2 emissions from fossil fuels are expected to grow at a faster rate than other greenhouse gases. Much of this growth comes from industrialising developing countries; two-thirds to three quarters of the total increase is expected to come from these countries. However, their per capita emissions are projected to remain well below those in developed countries. More recent projections tend to give higher increases.[17]

In 2000 the IPCC *Special Report on Emissions Scenarios* gave a 2100 range of -40% to +250% (again compared to 2000). This range is said to be still valid. More recent projections give a range of +90% to +250%. Even those scenarios that look at policies currently under discussion show global emissions increasing for 'many decades' and atmospheric concentrations of greenhouse gases unlikely to stabilise this century without 'major' policy changes.[18]

Further details on international emissions can be found in Appendix 2 at the end of the paper.

C. The Big Ask Campaign

In response to the expected failure of the Government to meet its 2010 target and concerns about meeting the 2050 target, particularly as there has been no clear fall in emissions since the mid-1990s, various NGOs began campaigning for tougher targets. The Big Ask Campaign was a Friends of the Earth's campaign which called for the introduction of a binding target through legislation for the reduction of carbon dioxide emissions from 2010 onwards. They proposed a law to make cuts year on year. The suggestion was for an annual reduction target of 3%.

As a result Michael Meacher's *Climate Change Bill* was published in July 2005. Section 1 stated:

> **1 National annual target for reducing carbon dioxide emissions**
>
> (1) It shall be a duty of the Prime Minister to take steps to ensure that United Kingdom emissions of carbon dioxide in any one year do not exceed the national annual target figure for that year, for every year from 2010 to 2050.
>
> (2) In this Act the "national annual target figure" shall be—
>
> (a) for 2010, 126 MtC, and

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15 Excludes emissions from land use change and forestry.

16 UNFCCC GHG data interface

17 *IPCC Fourth Assessment Report -Working Group III Report "Mitigation of Climate Change"*, IPCC. Chapter 1

18 ibid.

> (b) for each subsequent year, three per cent below the value in the preceding year.[19]

In addition, NGOs formed a coalition, which included over 20 organisations such as Friends of the Earth, Help the Aged, the Association for the Conservation of Energy, Christian Aid and WWF-UK, in support of a new climate law. EDM 178, which supported the campaign for a Climate Change Bill together with binding yearly targets and was signed by 412 MPs, stated:

> That this House agrees with the Government's Chief Scientific Adviser that climate change is a threat to civilisation; welcomes the cross-party agreement in favour of major cuts in greenhouse gas emissions, and particularly in carbon dioxide emissions, by 2050; believes that such a long-term target will best be met through a series of more regular milestones; and therefore notes the Climate Change Bill that was presented by a cross-party group of honourable Members in the final days before the General Election, and hopes that such a Bill will be brought forward in this Parliament so that annual cuts in carbon dioxide emissions of 3 per cent. can be delivered in a framework that includes regular reporting and new scrutiny and corrective processes.

The Bill was dropped. However, there were renewed calls for the Government to introduce its own Climate Bill with the similar aims. This had cross-party support and a letter to Tony Blair, dated 31st August 2006 and calling for a Government Bill, was signed by, amongst others, Shadow Environment Ministers for both the Conservatives and the Liberal Democrats.[20]

At the same time the Tyndall Centre for Climate Change Research published a summary report, commissioned by various climate groups and the Co-operative Bank, in which it examined whether and how the UK could meet its 2050 target of 60% for cuts in carbon dioxide emissions. *The Future Starts Here: The Route to a Low-Carbon Economy* reached the following conclusions:

- Carbon dioxide emissions had not fallen in the UK since 1990, despite Government claims to the contrary. The Government's figures ignored emissions from international aviation and shipping.

- The UK could emit no more than 4.6 Giga-tonnes of carbon between 2000 and 2050 if it was to deliver its fair share of emission cuts to achieve a concentration of 450 parts per million carbon dioxide in the atmosphere. This is the UK's "carbon budget". It estimated that a carbon budget of 4.6 Giga-tonnes is equivalent to roughly 28 years' worth of current emissions.

- The report concluded that the Government would have to introduce, as part of the measures to achieve the above target, a legal framework to reduce carbon dioxide emissions year on year in order to keep cumulative emissions well below 4.6 Giga-tonnes of carbon between 2000 and 2050, and report on progress annually.[21]

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19 Climate Change Bill, July 2005
20 Letter dated 31 August 2006
21 The Future Starts Here: The Route to a Low-Carbon Economy, September 2006

Further details were included in an Ends Report article published on 7 September 2006:

> **Tories join calls for binding annual carbon targets**
> The Tories have added their voice to those urging the government to introduce a climate change Bill setting statutory annual targets for carbon reductions and scrutiny procedures
>
> For some months MPs, charities and think-tanks have urged the government to include a climate change Bill in its programme for the 2006/07 parliamentary session, to be announced in the Queen's Speech in November.
>
> The latest call came in a letter to Prime Minister Tony Blair last week, with signatories including the Conservative and Lib Dem Shadow Secretaries of State for the Environment – Peter Ainsworth and Chris Huhne, Stop Climate Chaos, Friends of the Earth, Greenpeace and WWF-UK.
>
> Such a Bill would create a legal framework for annual carbon reduction targets and establish "reporting and scrutiny procedures" to monitor progress.
>
> The call echoes an Early Day Motion signed by 380 MPs, presented in May last year, which called for a climate change Bill to deliver a framework for 3% annual CO2 cuts and reporting and scrutiny processes.
>
> Under the Climate Change and Sustainable Energy Act 2006, the government must now report to parliament each year on the UK's greenhouse gas emissions and what it is doing to curb them. But the new Bill would require progress to be independently monitored, as well as a "carbon budgeting" approach.
>
> In a speech to coincide with the letter, Tory leader David Cameron said greenhouse gas emissions should be cut by at least 60% by 2050.
>
> Despite the Liberal Democrats' withdrawal from the cross-party initiative on climate change in June, the letter states that signatories believe the framework would be accepted by all parties, sending "a clear message… about the long-term direction of government policy" to give industry the "confidence to invest in solutions and technologies needed to cut emissions."

Government Response

In response to the calls for legislation the Queen's Speech in November 2006 included a commitment to the introduction of a Climate Change Bill. The Bill would:

- Put the Government's long-term goal to reduce carbon dioxide emissions by 60 per cent by 2050 into statute.
- It will establish an independent body - the Carbon Committee - to work with Government to reduce emissions over time and across the economy. Its advice will be open, transparent, equitable and mindful of sectoral and competitiveness impacts, including the need to secure energy supplies at competitive prices.
- Create enabling powers to put in place new emissions reduction measures needed to achieve our goals.
- Improve monitoring and reporting arrangements, including how the Government reports to Parliament.

However it was not clear how binding any targets would be. The Government also made it clear that it did not favour annual targets. This was not the position of the Conservative Party. In an article in the Financial Times, David Cameron MP, reiterated his support for annual targets:

> The UK needs a Climate Change Bill with annual binding targets for emissions. In their last three manifestos, Labour made a commitment to reduce emissions by 2010, last year they dropped this altogether. Only annual targets will create an economic price for carbon and encourage us to diversify our energy sources.[22]

Annual targets were again rejected by the then Prime Minister, Tony Blair, when he appeared before the Liaison Committee in February 2007:

> It will not have annual targets because we do not believe that is practical, but it will include targets for set periods of time, yes. That is entirely sensible for us to do because it gives us the necessary flexibility but still imposes rigorous targets on the Government. You will find when the Climate Change Bill happens that it will be, certainly, the most radical thing that has been brought forward from Government on the issue to do with green energy, and I think it will make a significant difference.[23]

D. Draft Climate Change Bill

A Draft Climate Change Bill, together with a partial Regulatory Impact Assessment, was published by the Government on 13 March 2007. At the same time a Climate Change Strategic Framework was published. In the accompanying press release the Secretary of State, David Milliband, set out the Government's purpose in publishing a Draft Bill:

> "With climate change we can't just close our eyes and cross our fingers. We need to step up our action to tackle it, building on our considerable progress so far. And time isn't on our side.
>
> "This bill is a critical part of the equation. It will help us achieve the twin goals I set out in the strategy I am also publishing today - demonstrating leadership through action at home, while also continuing to work towards a strong international agreement post-2012.
>
> "Crucially the Climate Change Bill, the first of its kind in any country, demonstrates our determination that this leadership role will continue.
>
> "Government must rightly lead from the front on this, but we want everyone - the public, industry, Parliament - to have their say to help us ensure that the bill really delivers."[24]

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22 *Financial Times*, 'A warmer world is ripe for conflict and danger', 24 January 2007

23 Tony Blair, Liaison Committee, 6 February 2007

24 DEFRA Press Release 76/07, *New Bill and strategy lay foundations for tackling climate change – Miliband*, 13 March 2007

1. Climate Change Strategic Framework

The Strategic Framework set out the Government's vision and what it saw as the two strategic challenges for the UK Government with regard to climate change:

- how to mobilise support for an international agreement that will drive investment in a low-carbon global economy,
- how to minimise the costs, and maximize the benefits of the UK moving to a low carbon economy.[25]

The document set out the case for a robust international framework based on long term goals, creating a global carbon price, a focus on technology and energy efficiency. It also made clear the case for putting in place measures for preventing deforestation – which accounts for 20% of global emissions – and helping poorer countries to adapt to the unavoidable impacts of climate change. The Climate Change Bill would also be aimed at showing leadership internationally by focusing on domestic emissions.

Domestically, the focus was on creating a carbon budget (through the Bill), with a focus on carbon trading; new regulation (either at UK or EU level) on emissions from homes, low carbon fossil fuels, car emissions and product energy efficiency. There was also emphasis on the importance of technology transformation and changing behaviour.

The overall stated goal was to reduce the UK's ecological footprint to a sustainable level in a way that minimises economic costs, and ensures an equitable distribution of responsibility between generations, nations, and sectors.[26]

2. Provisions of the Bill

The consultation document set out the following rationale for legislating on targets for carbon reductions:

- 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.[27]

The proposals in the Draft Bill included the setting of a long term legal target of reducing carbon dioxide emissions (rather than all greenhouse gases) by 60% by 2050 compared to 1990 levels. This is because carbon dioxide emissions have so far been the hardest

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25 DEFRA, *UK Climate Change Strategic Framework*, March 2007
26 ibid

27 DEFRA, *Draft Climate Change Bill Consultation*, 13 March 2007

greenhouse gas to reduce in the UK. There was also a proposal for an interim target of 26-32% for 2020.

The proposal was for five year carbon budgets (possibly with a statutory basis), that would allow banking and borrowing from one five year period to the next. It would also allow a proportion of carbon credits to be purchased from abroad to be included in the budget. Three successive budgets would be presented at the same time – covering a total of 15 years – with the aim of providing certainty for business when making long term decisions. Powers to amend the budgets would be available using secondary legislation, but only as a result of significant changes in circumstances and after advice from the proposed Committee on Climate Change.

Failure to comply with carbon budgets and targets would make it possible to subject the Government to judicial review. An annual reporting system would be put in place, followed by a report from the independent Committee on Climate Change, which in turn would have to be responded to by the Government. A five year report would also be presented at the end of each budget.

The proposed Committee on Climate Change would be an independent body with up to nine members supported by a secretariat with a strong analytical skill base. The Government was consulting on whether members should be technical experts rather than representatives of stakeholder groups, and what areas of expertise should be represented. The role of the Committee would be to advise the Government on setting the targets for each budget; levels of permissible reductions that could be purchased from overseas; obligations for sectors covered by trading schemes and those sectors that are not. The consultation also asked for responses on what factors should be considered by the Committee when formulating its advice.

Finally the draft focused heavily on emissions trading as a mechanism for reducing carbon emissions and proposed introducing general enabling powers for the creation of domestic carbon trading schemes using secondary legislation.

3. Partial Regulatory Impact Assessment

The RIA published by the Government at the same time as the Draft Bill included the following summary of costs and benefits:

> **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-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.[28]

E. Report of the Joint Committee

A Joint Committee of the two Houses, chaired by Lord Puttnam, was set up to examine the Draft Bill in detail. The Committee published its report on 3 August 2007.[29]

In its report the Committee welcomed the Draft Bill as a sign that the UK Government intended to take the issue of climate change seriously:

> We warmly welcome the introduction of a Climate Change Bill. It is heartening to see the UK continue to take a lead in tackling critical global issues relating to climate change by providing the world's first comprehensive legislation in this area. We hope that this Bill will provide a framework for other countries to commit themselves to substantial reductions in carbon emissions.[30]

1. Scope and targets

Whilst generally supportive of the Government's approach the Committee was critical of several areas. In particular it felt it was a serious weakness that the Draft Bill did not include international aviation emissions within its scope, and was also critical that these were not included in the UK's net carbon account. If the Government intended to include emissions from shipping and aviation within existing 2050 targets it concluded:

> the Government must publish at an early stage, a proposed baseline for the inclusion of aviation emissions, an analysis of how this would affect the UK's share of global cumulative emissions, and the basis on which it decides the level of its 2050 target[31]

With regards to the targets included in the Draft Bill the Committee concluded that the 60% target should be considered a first step and would have to be reviewed:

> 44. We understand, and sympathise with, the argument in favour of setting a higher target for the long-term reduction of carbon dioxide emissions. But recognizing how

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28 DEFRA , *Draft Climate Change Bill, Partial Regulatory Impact Assessment*, March 2007

29 Joint Committee on the Draft Climate Change Bill, *Draft Climate Change Bill*, Session 2006-07, HL Paper 170-1, HC 542-1, 3 August 2007

30 ibid

31 ibid

> very demanding the target set out in the draft Bill for 2050 is, and facing up to both the complexity of domestic budgeting and international requirements, we conclude that the approach adopted by the Government is appropriate provided that it is understood that this is but the first step along a path towards a low-carbon future for the UK. […] We also recommend that the long title of the Bill should be amended to state explicitly, as the Environment Secretary of State emphasised several times in his evidence to us, that the target should be at least 60% and subject to review.
>
> 45. Bearing in mind however the weight of scientific evidence before the Committee that a target of more than 60% is likely to be necessary, we believe that as soon as possible after it is established, the Committee on Climate Change should review the most recent scientific research available and consider to what extent the target should be higher than 60%, with a view to making recommendations on the appropriate amendment to the long term target.[32]

The Committee also highlighted the importance of cumulative emissions and how these would increase if there was a delay in achieving decreased emissions on route to the 60% target.

With regard to the interim target the Committee supported the minimum of 26% as necessary to provide certainty as to the direction of travel, although it noted that "it raises troubling issues about the independence of the Committee on Climate Change in determining for itself the optimal emissions trajectory". The Committee also made it clear that it did not support a maximum interim target – set in the Draft Bill at 32%:

> We were not convinced by the Government's arguments over the need to set a limit to the maximum carbon savings which could be achieved. We see no need for such a limit in view of the fact that the Government will itself be setting the first three carbon budgets - including that covering the 2020 interim target - soon after the legislation is enacted. In addition, should the EU greenhouse gas target which the UK is asked to take on be increased to 30%, this could conflict with an interim target of 26-32%. It is therefore not obvious to us why the Government should wish to restrict the maximum carbon reduction in this way.[33]

2. Carbon budgets

The Committee supported the proposed five-yearly budgets "provided there is a strong system of annual reporting on progress". This view was also that of most of the organizations which originally campaigned for yearly targets, such as Friends of the Earth. They said to the Committee:

> We are perfectly happy to admit we have changed our position and thought that a combination of this budget, which would do the averaging work for you, does away with the need for variability, but you need to hold the government to account each year on whether it is on track for meeting that budget.[34]

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32 ibid
33 ibid
34 ibid

The Committee also took the view that detailed analysis of the potential for reductions in different sectors should be carried out and made public by the Committee on Climate Change (CCC):

> If budgetary targets are to have any credibility, they must be based on a detailed analysis of the scope and potential for carbon reductions in specific sectors. To that extent we recommend that the Government, as a minimum, both makes publicly available the detailed analyses and forecasts which underpin the targets which are recommended and set, and lays out indicative figures for reductions in each sector.[35]

The following amendments were also proposed:

- the Committee concluded that the Draft Bill should be changed to remove the option of amending budges retrospectively for up to 15 months to prevent any undermining of investor confidence and credibility of the Bill.
- The CCC should have a duty to report annually on the use of carbon credits in the preceding year. Furthermore there should be super-affirmative resolution procedure (which allows for greater parliamentary scrutiny) in place for regulations which define the types and values of the different allowable carbon credits.[36]
- The Draft Bill should be amended to give the Secretary of State a duty to set caps on the use of international credits against the UK's carbon budget and to publish the rationale behind the level set.
- The Committee supported the borrowing provisions in the Draft Bill. It also proposed that banking domestic over-achievement should be limited by the Bill and that the banking of overseas carbon credit should be prohibited.
- The Government should have a duty to report to Parliament within six months of setting the carbon budget on the policy proposals for meeting the target and that any motion put before the House to agree the CCC's report should be substantive and amendable.[37]

3. Enforcement

The Committee expressed misgivings about the enforceability of the requirement under the Draft Bill to "ensure" that five yearly targets and the 60% reduction in carbon emissions by 2050 are met. The majority of witnesses did not see judicial review as an effective tool for enforcing the duties imposed in the Draft Bill. The Committee suggested a different approach:

> An alternative, which is our strong preference, is to introduce a compliance mechanism within the Bill that will give both meaning and strength to the duty to "ensure" by compelling the Secretary of State to redress any failure to meet a target or budget, where necessary through court intervention based on the compliance mechanism.[38]

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35 ibid
36 ibid
37 ibid
38 ibid

And

> We recommend that Government introduces into the draft Bill a similar type of compliance mechanism to the arrangements under the Kyoto Protocol.[39]

The Committee went on to set out how it envisaged this mechanism functioning:

> If the UK is to limit its cumulative emissions to its appropriate and internationally agreed share, there should be a duty to make up for failure.
>
> This principle is recognised in the Kyoto Protocol compliance mechanism. We believe it should be reflected in the draft Bill. If a carbon budget is exceeded, we recommend that the excess emissions are deducted from the carbon budget for the subsequent period. It will then be a matter for Government to determine how the extra effort is to be achieved and to publish an action plan setting out its strategy. We also recommend that serious consideration is given to suspending the sale of carbon credits and debits by the Government during a period of default, in a similar way to paragraph (5c) of the Kyoto Protocol compliance procedure.[40]

Finally, the Committee concluded that the duties in the Draft Bill should be placed on the Prime Minister rather than the Secretary of State:

> The level of co-ordination and co-operation required both domestically and internationally is, in our view, unprecedented in recent times. We feel this justifies an equally unprecedented approach by placing the duties in the draft Bill on the Prime Minister, whom we consider is best placed to fulfil them. We recommend that the duties in the draft Bill are placed on the Prime Minister instead of the Secretary of State.[41]

4. Committee on Climate Change (CCC)

The report made a series of recommendations as to the role of the CCC and how it should function:

- The Government needs to ensure that it sets out a clear idea of the role it envisages the Committee on Climate Change playing over the next forty and more years.
- We recommend that the Bill explicitly set out that the Committee on Climate Change is required to advise the Secretary of State on contributions by each sector towards meeting the carbon budget.
- We recommend that the draft Bill place a statutory duty on the Committee on Climate Change to publish the analysis that supports its recommendations on sectoral targets. More broadly, we recommend that the draft Bill be amended to require the Committee on Climate Change to publish the advice and analysis it gives to the Government, and its formal minutes.

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39 ibid
40 ibid
41 ibid

- We recommend that the draft Bill include a power for the Committee to carry out an evaluation of current and potential policy when advising the Secretary of State.
- We recommend that the Government be required to respond within two months to the advice of the Committee on Climate Change, setting out how it intends to act upon the recommendations and, in the event that the Committee's advice is rejected, giving a full explanation of the reasons for reaching a different decision
- We recommend the Government consider a role for the Committee on Climate Change in assuming oversight for government energy and transport modelling, in order to ensure that it is transparent to climate change researchers.
- We recommend that the Committee have an annual research budget that is substantially higher than the £500,000 per annum currently proposed in order to carry out truly authoritative and independent advice and to ensure that it establishes the greatest possible credibility with government, local government, business and the general public
- We recommend a funding mechanism is established for the Committee outwith the Defra budget.
- We recommend that the Bill be amended so that the September 2008 deadline applies only to the carbon budget for 2008-2012, and that the Committee be required to advise on the subsequent two budgets by September 2009, with the power to revise the 2008-2012 budget if this is necessary to ensure the coherence of the 15 year period.[42]

5. Emissions trading schemes

The Committee had reservations about the lack of specific information in the Draft Bill as to how the enabling powers would be used to set up trading schemes. It expressed particular reservations with regard to personal carbon allowances (also known as domestic tradable quotas):

> Given the reasons set out by the Government, we are content that including broad enabling powers in the draft Bill is appropriate. We are somewhat surprised at the apparent vagueness in Government thinking as to the purposes for which these powers would actually be used. Clearer guidance should be produced describing a number of potential trading schemes and revisions to them, and explaining their prospective implications and benefits, to give Parliament and the public a better understanding of the scope of these powers. As for personal carbon trading schemes, while these would appear to have important potential, the major impacts that they might have on the economy and people's personal circumstances mean it is essential that these should only be introduced through primary legislation.
>
> We still remain concerned however that the wide-ranging enabling powers would allow for the introduction of potentially very radical schemes. We conclude that, to ensure adequate accountability to Parliament for the use of these enabling powers, the provisions concerning the way in which secondary legislation is to be scrutinised and passed ought to be strengthened.[43]

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[42] ibid
[43] ibid

6. Adaptation

The Committee welcomed the focus on adaptation to climate change impacts in the Draft Bill. However, it recommended that adaptation be included in the long title of the Bill, to reflect its significance. Furthermore:

> As currently drafted, we do not feel that the draft Bill communicates the same sense of urgency in respect of adaptation measures as it does in respect of mitigation measures. We think that the Bill should be more explicit about the UK's strategy for addressing the need for adaptation measures. We recommend that the reporting duty should be strengthened to impose an adaptation duty on the Secretary of State to report on the risks, the policy proposals to address those risks and then to implement those proposals.[44]

7. Local government and behaviour change

In addition to commenting on the details of the Bill the Committee looked in its report at the role of local government in encouraging behaviour change in individuals with regards to emissions. It concluded:

- We consider that the single most important action the Government could take to encourage local authority action on climate change is to include it in the Comprehensive Performance Assessment process.

- We agree with the overwhelming view of submissions from local government and regional government bodies that, whether in the Bill or elsewhere, the Government must give far higher priority to addressing the issue of individual behaviour change, and the role of local government in achieving this in its capacity as a major community leader. We expect the Government to back efforts to change individuals' behaviour with major public information campaigns, appropriately funded, which may be required to continue over an extended period.[45]

F. Reports of the Environmental Audit Committee and the EFRA Committee

The Environmental, Food and Rural Affairs Committee published its report *Draft Climate Change Bill* on 4 July 2007. The Environmental Audit Committee (the EAC) published its report *Beyond Stern: From the Climate Change Programme Review to the Draft Climate Change Bill* on 30 July 2007. Both Committees broadly supported many of the conclusions of the Joint Committee. Five year periods were supported as the approach to budgeting and both Committees agreed that the CCC should have some role in advising on and recommending policies to the Government.

The Committees went further than the Joint Committee by recommending the removal of the upper limit of the interim target; the EAC also recommended the lower limit be increased to

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[44] ibid
[45] ibid

32%. A further point made by both Committees was that there should be greater focus on cumulative targets. The Environmental Food and Rural Affairs Committee recommended that:

> The Government should also incorporate within the Bill targets relating to cumulative emissions. These should address overall budgets to 2020 and to 2050 in quantitative terms (tonnes of CO2eq) rather than only using annualised percentage reductions. This addition to target setting would help set the framework for each of the five-year budgets required by the Bill.[46]

This was echoed by the Environmental Audit Committee:

> Earlier budgets should contain steeper reductions: as the Stern Review made clear, early cuts in emissions are disproportionately beneficial. The Government should also examine the feasibility of introducing sector-specific emissions pathways to be defined to 2050, notably for power generation, buildings, and transport; this would help to identify in more detail the scale, timing, and nature of the developments needed in order for the UK as a whole to meet its targets.[47]

G. Government Response to Committee Reports and Consultation

A response to the consultation and Committee reports was published by Defra in October 2007. This set out the main changes the Government intended to make to the Bill:

- There was strong support in consultation responses to increasing the 60% target. The Committee on Climate Change will be asked to report on:

  > Whether the 60% reduction in emissions by 2050 should be even stronger still. This report will also look at the implications of including other greenhouse gases in our targets, and we will take powers to allow us to do this at a future stage if necessary. In addition, the report will also examine the implications of including international aviation and shipping emissions in our targets.[48]

- To strengthen reporting on annual performance the Bill would include, in addition a requirement for the Committee on Climate Change to report to Parliament on progress towards meeting targets, and the Government to respond, by:

  > • requiring the Committee on Climate Change to publish its analysis and advice to Government on setting the budgets, as well as the minutes of its meetings;

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46 EFRA Committee, *Draft Climate Change Bill,* Fifth Report of Session 2006-07, HC 543-I, 4 July 2007

47 EAC Committee, *Beyond Stern: From the Climate Change Programme Review to the Draft Climate Change Bill*, Seventh Report of Session 2006-07, HC460, 30 July 2007

48 Defra, Taking Forward the UK Climate Change Bill: The Government Response to Pre-Legislative Scrutiny and Public Consultation, Cm 7225, October 2007

> • requiring the Government to explain its reasons to Parliament if it does not accept the Committee's advice on the level of the carbon budget, or if it does not meet a budget or target;
> • rationalising and increasing the coherence of the current reporting requirements on carbon dioxide and other greenhouse gas emissions; and
> • reporting annually to Parliament on emissions from international aviation and shipping in line with UNFCCC practice.[49]

- To strengthen the role and independence of the Committee on Climate Change by:

> requiring Government to seek the Committee's advice before amending the 2050 or 2020 targets in the Bill, before introducing the first set of regulations on the use of carbon credits, and before establishing any trading schemes under the Bill. This should further ensure that decisions are robust and based on a high level of transparent scrutiny. In addition, we intend to strengthen the Committee's independence of Government by confirming that it will appoint its own chief executive and staff, and plan to increase the resources which will be available to it in the light of the parliamentary committees' recommendations.[50]

- Using powers within the Bill to:

> implement the Carbon Reduction Commitment – a mandatory cap-and-trade scheme covering energy use emissions from large, non-energy-intensive organisations; improve the operation of the Renewable Transport Fuel Obligation (RTFO); and provide a power to pilot local authority incentives for household waste minimisation and recycling. […]Together, these policies could save the equivalent of up to 9.4-13.9 million tonnes of carbon dioxide equivalent per year by 2020.[51]

- Under the Bill the Government would also be required to report to Parliament on the risk to the UK from the impact of climate change, and publish - and regularly update - a programme on how the likely impacts will be addressed.[52]

II Climate Change Bill

The *Climate Change Bill* was presented in the House of Lords on 14 November 2007.

On 19 November 2007 the Prime Minster, Gordon Brown, gave a speech on climate change at the Foreign Press Association where he summarised the Government's aims for the Bill:

> Our Climate Change Bill will place a statutory cap on Britain's emissions. Five year carbon budgets will be set on the advice of the new independent Climate Change Committee. That will provide certainty for investors, businesses and consumers. And

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[49] ibid
[50] ibid
[51] Ibid
[52] ibid

> just as I thank Hilary Benn for his work, I thank David Miliband for all the work that he did on the Bill when he was Secretary for the Environment.
>
> Every new policy will be examined for its impact on carbon emissions, not just those which reduce emissions but those which increase them. And where emissions rise in one sector we will have to achieve corresponding falls in another. And the legislation will enact our target of achieving a reduction in carbon dioxide emissions of at least 60% by 2050 through domestic and international action.
>
> But the evidence now suggests that as part of an international agreement developed countries may have to reduce their emissions by up to 80%. So we will put this evidence to the Committee on Climate Change, ask it to advise us as it considers the first three five-year budgets on whether our own domestic target should be tightened up to 80%.
>
> The Climate Change Bill will also put on the statute our interim target for 2020 of a 26 - 32% reduction in carbon dioxide emissions. That means cutting greenhouse gas emissions overall by between 32 and 37%, Britain's contribution to the European target and to the new international climate change agreement that we all seek. [53]

A. Reaction to the Bill

1. Political parties

Commenting on the *Climate Change Bill* on its publication in the Lords, Liberal Democrat Shadow Environment Secretary, Chris Huhne MP said:

> The principle of this Bill is right, but it is too weak in failing to set ambitious targets for 2050 in line with scientific evidence.
>
> It fails to give annual benchmarks, and does not include aviation and shipping or other greenhouse gases like methane. Five-year carbon budgets combined with four-year parliaments do not make for ministerial accountability.
>
> This opportunity must not be wasted, we need a cross-party debate on whether there can be a consensus to toughen up these proposals. We need a route map for the long march to a low carbon economy.
>
> The Secretary of State should also appoint a shadow climate change committee of scientific experts to get to work before the bill becomes law.[54]

In response to the Prime Minister's speech Mr Huhne welcomed as long overdue "Brown's admission that the 60% reduction in carbon emissions may not be enough" and called for the target to be increased to at least 80% to reflect the most up to date science. [55]

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53 Speech on Climate Change by Gordon Brown at the Foreign Press Association, 19 November 2007

54 Lib Dem Party, *"Climate Change Bill should be tougher – Huhne"*, 15 November 2007

55 Lib Dem Party, *"Brown has failed to acknowledge scale of climate change challenge – Huhne"*, 19 November 2007

Lord Teverston, Liberal Democrat Environment Spokesperson in the Lords signalled the party's intention to ensure the legislation refers "to the challenge of keeping global temperature rises below two degrees. Without this there is no logic in specific emission reductions."[56]

Peter Ainsworth, Shadow Environment Secretary, stated the following in response to the consultation on the Climate Change Bill:

> While we welcome the changes that have strengthened the Climate Change Bill, it alone will not reduce our carbon emissions. The whole point of the Bill is to change the mindset so that climate change is not an add-on, but central to the way the Government thinks and act. The Government must now ensure that its policies match up to its rhetoric. [57]

The Green Party called the Bill dangerously unambitious and called for much more stringent targets:

> We need a Climate Change Bill which sets binding emissions-reduction targets of at least 6 per cent a year to allow us to achieve cuts in UK GHG emissions in the region of 90 per cent by 2030.
>
> For the bill to avoid being just the latest example of fine rhetoric divorced almost entirely from the reality of the problem, it must also be backed by a wholesale review of Government policy, including Labour's commitment to road-building and aviation growth.
>
> To make real headway on curbing our emissions, we need to act now - we do not have time for yet more commissions and reviews, for more political delay.[58]

2. NGOs

Many environmental and development NGOs were part of the campaign to bring forward a bill on climate change and as such welcomed the introduction of the Bill. However, the majority also called for the 2050 target to be increased to 80%.

Friends of the Earth welcomed the Bill but called for it to include emissions from shipping and aviation:

> We're delighted that the UK is set to become the first nation to introduce legislation to cut its contribution to climate change. But the Government must strengthen its proposed legislation if it is to be truly effective and deliver the scale of action that scientists are now calling for. This means setting annual milestones that will deliver at least an 80 per cent cut in carbon dioxide emissions by 2050, and including Britain's share of emissions from international aviation and shipping.[59]

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56 Lib Dem Party, *"Climate Change Bill must be strengthened - Lord Teverson"*, 26 November 2007

57 Conservative Party, 'Ainsworth: Bill must change the mindset so climate change is central to the way the Government thinks and acts', 29 October 2007

58 Green Party *"Climate Change bill 'dangerously unambitious'"*, 15 November 2007

59 FOE Press Release *"Queen's Speech: Climate law needs strengthening, planning law needs rethink"*, 5 November 2007

This view was supported by WWF in their response to the Bill:

> The Government now has an opportunity to prove its commitment to fighting climate change by setting more ambitious targets in the Climate Change Bill. It is vital that the UK follows the lead of the Scottish Government and commits to reducing emissions by at least 80 per cent by 2050. All the science – including the Government's own assessments –tell us that this is what is needed to avoid the most devastating impacts of climate change.[60]

WWF, the RSPB and the Institute for Public Policy Research also published a report *80% Challenge: Delivering a low-carbon UK* on 5 November 2007. This examined whether it would be possible for the UK to achieve an 80% reduction in carbon dioxide emissions by 2050 whilst excluding new nuclear energy and placing a limit on both biofuels and wind energy. The report concluded that the cost of meeting the 80% target, including international aviation emissions, ranged between approximately 1.5% and 3% of GDP in 2050:

> The economy would almost triple in size by 2050, even with an 80% cut in emissions. GDP would reach the same level as it does in 2050 under business-as-usual one and a half years later, in the spring of 2052. Costs would be significantly lower if barriers to energy efficiency are addressed successfully. The costs of achieving the 80% target are also dwarfed by the costs of unmitigated climate change. Decarbonising the UK economy by 80% would cost between one half and one tenth as much as doing nothing, based on Stern's estimate that climate change damage costs would reduce global GDP by between 5% and 20%.[61]

Christian Aid called the Government "short-sighted" and called for an 80% target to be included in the Bill:

> The Climate Change Bill is a milestone in the fight against climate change, which we applaud, but it is nonsensical to push through legislation that is based around an out of date target. The UK needs to cut emissions by at least 80% by 2050.[62]

Similar views were expressed by the World Development Movement:

> The target to reduce carbon emissions by 60% in the climate change bill simply isn't enough to avoid disastrous consequences for the world's poor. The government's proposed 'review' of the target, after it has become law, looks like a delaying tactic in the face of compelling scientific evidence on the need for greater emissions cuts.

The Sustainable Development Commission on the other hand expressed the view in its memorandum to the Joint Committee that they "recognise that this [60%] target may have to increase but are satisfied with the measures the Government has taken to link this process to the wider international context".[63]

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60 WWF Press Release *"Fighting emissions but glaring omissions in the Queen's Speech"*, 6 November 2007
61 WWF, IPPR, RSPB, *80% Challenge: Delivering a low-carbon UK,* 5 November 2007
62 Christian Aid Press Release, *Climate bill welcome but flawed,* November 2007
63 Joint Committee Report, Draft Climate Change Bill, Volume II, Report of Session 2006-07, 24 July 2007. Ev 199,

3. Business and industry

Business and Industry bodies also welcomed the Bill but sounded a more cautious note when commenting on its publication.

The Federation of Small Businesses stated:

> Small businesses stand ready to do their bit to cut carbon emissions. However, the Government has to do much better at providing advice to them so that they can achieve this. The balance between economic growth and environmental legislation must be maintained because only by increased investment in research and development by the private sector will we find solutions to the problems of climate change.[64]

The Confederation of British Industry stated:

> Combating climate change is a challenge for us all, and business urgently needs a credible framework to work towards a low carbon economy. We believe the Climate Change Bill can provide that.
>
> The use of an interim target and rolling 'carbon budgets' should help to provide the right balance of certainty and flexibility.[65]

and

> Analysis developed specifically for the report by consultants McKinsey shows the UK's carbon reduction targets for 2020 are likely to be missed but that 2050 goals, whilst stretching, can be achieved at a manageable cost - provided a greater sense of urgency is now adopted.
> […]
> …alongside the risks, the shift to a low carbon economy offers the UK a unique opportunity to develop innovative environmental technologies of the future and prosper in new, multi-billion-dollar world markets - but only if research funding is better co-ordinated and prioritised.[66]

4. International reaction

The United Nations Development Programme published its Human Development Report 2007/2008 *Fighting Climate Change: Human Solidarity in a Divided World* in November 2007. In its chapter on strategies for mitigation it focused particularly on the UK's approach to mitigation, in particular the proposals for the *Climate Change Bill*, concluding that "the challenge for the United Kingdom is to align a more stringent target with wide-ranging energy policy reform":

> The United Kingdom's Climate Change Bill is a bold and innovative proposal to create a national carbon budget that supports global mitigation efforts. Legislation would

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64 FSB News Release, *Business reaction to the Queen's Speech*, 6 November 2007
65 CBI News Release, *CBI reaction to Queen's Speech*, 6 November 2007
66 CBI News Release, *British business commits to 'do what it takes' to tackle climate change – major new report*, 26 November 2007

> commit Government to mandatory cuts in emissions over time. Applied more widely across the developed world, the broad approach could underpin a strengthened post-2012 Kyoto system. However, there are serious questions about the level of ambition—and about the United Kingdom's capacity to meet its own carbon reduction targets.

The report concluded that two issues will have to be addressed if the *Climate Change Bill* is to provide the framework for a sustainable carbon budget:

> The first problem is one of overall ambition. Emission targets in the Climate Bill are not consistent with the objective of avoiding dangerous climate change. Our sustainable emissions pathway suggests that developed countries need to cut emissions of greenhouse gases by at least 80 percent by 2050 against 1990 levels, not 60 percent. Moreover, the current framework excludes aviation and shipping. Factoring them in would raise the cumulative United Kingdom carbon budget to 2050 by around 5.5 Gt CO2, or 27 percent.
>
> If the rest of the developed world followed the pathway envisaged in the United Kingdom's Climate Change Bill, dangerous climate change would be inevitable. It would lead to approximate atmospheric concentrations of greenhouse gases in excess of 660 ppm CO2e, and possibly 750 ppm CO2e. These are outcomes that would correspond to a rise in average global temperatures of 4–5°C, well beyond the dangerous climate change threshold. The overarching requirement for keeping within the 2°C threshold is a stabilization of greenhouse gas stocks at 450 ppm CO2e.
>
> The second problem to be addressed is the direction of current greenhouse gas emissions. On a positive note, the United Kingdom is one of a small group of European Union countries that is on-track for achieving its Kyoto Protocol target. While the economy has expanded by 47 percent since the 1990 base year for Kyoto, emissions of CO2 are 5 percent lower. The less positive news is that all the reduction took place prior to 1995. Since 2000, emission levels have increased by 9 Mt CO2 (to 567 Mt CO2 in 2006). The upshot is that the national target of reducing CO2 emissions to 20 percent below 1990 levels by 2010 is now unattainable: the likely outcome is a reduction less than one-half this target.[67]

Dr Lu Xuedu, Deputy Director General, Office of Global Environmental Affairs, Ministry of Science and Technology, People's Republic of China, supported the Bill in evidence to the Joint Committee as an example for other countries to follow:

> we appreciate very much the efforts made by the United Kingdom, in particular your Parliament, to consider this. Personally I think this is a very good action taken to address climate change. It is my observation or my personal view that this bill will have a significant influence not only on China but also the world. This will show that the United Kingdom is continuing to take the lead in addressing climate change. Actually, I have been involved in climatic change issues for some time, and I really appreciate the leadership that your government is taking, and has been taking in the past 17 years, or more than 17 years. This law I guess will be number one in the world. I guess, as stated in your draft bill, this bill will also give a signal to business people, the whole of society, to address climate change in a more certain manner for

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67 UNDP, *Human Development Report 2007/2008 Fighting Climate Change: Human Solidarity in a Divided World*, November 2007.

> a long run, so this is a very good action. We say, actually your action today will be the action of those countries tomorrow. So I think this action, this will be my belief, will have a good, significant and positive influence on the world. Maybe if I can add, this bill will also give very strong signal to the business community, that they should develop a low carbon economy.[68]

B. Climate change targets in other countries

a. Australia

In Australia the Government of the State of South Australia has enacted climate change legislation, the *Climate Change and Greenhouse Emissions Reduction Act 2007.* It came into force in July 2007. A press release on the State of South Australia Government website explains that the legislation sets three targets to:

- reduce greenhouse gas emissions in the State by at least 60 per cent of 1990 levels by the end of 2050;
- increase renewable electricity generation so it makes up at least 20 per cent of electricity generated in the State by the end of 2014;
- increase renewable electricity consumption so it makes up at least 20 per cent of electricity used in the State by the end of 2014.[69]

South Australia appears to be the only state to have enacted such legislation in Australia.

b. France

France has legislation – "*Loi n°2005-781 du 13 juillet 2005 de programme fixant les orientations de la politique énergétique*" which is an energy law enacted in 2005 which sets an objective for France of reducing emissions by 3% each year in a bid to combat climate change. A translation of Article 2 suggests that the 3% reduction is an "aim" rather than a legally binding target. Article 2 of this law also suggests that developing countries, including France should aim for a four to five-fold reduction in emissions by 2050.

Under this law, France must produce a "climate plan" which is updated every two years, and implement any national actions. In 2007 there was a four-month stakeholder forum in Paris, called the "Grenelle Environment Forum". It concluded in October 2007. Amongst other things, it set out measures to enable France to comply with the European target of a 20% of energy consumption from renewable resources by 2020.[70]

An article from the OECD Observer states that France's 2006 emission levels were already 4% lower than the Kyoto ceiling for the 2008-2012 period.[71]

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68 Joint Committee on the Draft Climate Change Bill, *Draft Climate Change Bill,* Cm 7040, Q785, 13 March 2007

69 Government of South Australia, *News: Climate Change - now it's law*, 3 July 2007

70 France Government Portal, *Presentation of the Grenelle Environment Forum conclusions speech by M. Nicolas Sarkozy, President of the Republic*, 2 November 2007

71 "Ministers' roundtable on climate change What ministers are doing" *OECD Observer website*, March 2008

c. Germany

At its meeting in Meseberg in August 2007 the German Cabinet adopted an energy and climate programme, consisting of 29 key elements. Further legislative proposals are expected in the near future.[72] The package of new legislation and amendment to existing legislation is expected to reduce emissions by 36% below 1990 levels by 2020. The reductions will be brought about in principle by the expansion of renewable energy technology in the electricity sector, increased energy efficiency in buildings and reductions made by the transport sector.[73] The German government has also stated that it would be willing to reduce emissions by 40% in this period – depending upon the outcome of EU level negotiations.[74]

d. USA

In the US a summary of individual state and regional targets to reduce emissions is available from the Climate Change analysis and policy group, *Pew Centre on Global Climate Change website*.

Republican Presidential candidate John McCain has pledged to cut emissions by 60% below 1990 levels by 2050.[75]

The "Obama 08" website shows a commitment by Democratic Presidential candidate Barack Obama to introduce a 100% auction cap-and-trade programme to reduce carbon emissions by 80% below 1990 levels by 2050.[76]

C. The Shadow Committee on Climate Change

A shadow Committee on Climate Change has already been set up by Defra to allow it to meet the target of publishing its advice on the first budgets by the end of 2008:

> To ensure that the Committee is able to provide high quality advice within the timeframe proposed by the Bill, and so that it is fully up and running as soon as possible after it gains its full legal responsibilities and status, the Government is setting up the Committee in shadow form this year as a nonstatutory body.[77]

Lord Rooker summarised the proposed role for the Committee on Climate Change as follows during the Second Reading of the Bill in the Lords:

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72 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety website, *The Integrated Energy and Climate Programme of the German Government* [on 6 June 2008]

73 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, *The Integrated Energy and Climate Programme of the German Government,* December 2007

74 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, *The Integrated Energy and Climate Programme of the German Government,* December 2007, p14

75 Remarks By John McCain on Climate Change Policy delivered at the Vestas Training Facility, in Portland, OR, *Targeted News Service*, 12 May 2008

76 Obama 08 website, *Barack Obama's plan to make America a global energy leader* [on 6 June 2008]

77 Defra, Shadow Secretariat – Committee on Climate Change: Call for Evidence,

> The Committee on Climate Change [...] will be an independent non-departmental public body. It will advise the Government and the devolved Administrations on the emissions reduction pathway to the 2050 target and specifically on the level of the carbon budgets. The committee will use its expertise to balance economic, social and environmental factors and will take account of external issues including energy prices, economic growth forecasts and international developments.
>
> To ensure a really strong system of annual accountability, the committee will have a duty to report annually to Parliament and the devolved legislatures on the UK's progress towards meeting its emissions reduction targets, and the Secretary of State will have a duty to respond.[78]

In response Lord Taylor of Holbeach, made clear that the Conservative Party would like to see the power of the Committee enhanced so that it becomes a commission with powers to set targets itself:

> We find the Government's creation of a Committee on Climate Change purely to advise the Secretary of State to be a wholly inadequate vehicle to bring science to the heart of this great endeavour. To put it bluntly, the committee needs to be beefed up: it needs to have clout; it needs to have credibility; and it needs to know that its work will be the foundation for government action. That is why we will recommend that it is given the status of a commission—the commission on climate change. We intend this to give the members status as commissioners and their work to go beyond the mere giving of advice to making recommendations and outlining detailed strategies for climate change reduction. That will drive government action—in effect, putting the commission centre stage in the process.
>
> We will offer amendments to transfer many of the powers now lying with the Secretary of State to the commission on climate change. Among these, importantly, is the power to set and amend the targets. We strongly feel that, whatever targets are set, they can be given strength and credibility in the public sphere only if they come from a commission of experts.[79]

The process of recruiting for the posts of Chair Designate and five members for the Committee on Climate Change took place at the end of last year. Membership of the Committee was announced by Hilary Benn, Secretary of State for Environment, on 22nd February 2008: Scientists Sir Brian Hoskins and Lord Robert May, technologist Professor Jim Skea; economists Dr Sam Fankhauser and Professor Michael Grubb will make up the new Committee. Lord Adair Turner was appointed Chair of the Committee. He is currently chairman of the Economic and Social Research Council, and is a previous head of the CBI.[80]

Lord Turner has recently also being appointed head of the Financial Services Authority. As a result the *Guardian* reported that Lord Turner would step down from the Committee by the end of 2008:

> Darling has persuaded Tony Blair's former pensions adviser to step down from heading the government's committee on climate change. After a search lasting

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78 HL Deb 27 November 2007 c1125
79 HL Deb 27 November 2007 c1128
80 Defra News Release, *Founding members of committee on climate change appointed,* 22 February 2008

> several months, Turner was appointed chairman of the Financial Services Authority to replace Sir Callum McCarthy, who will step down in the autumn.
>
> Turner, formerly director general of the CBI and chairman of the Low Pay Commission, had been keen to stay on as the head of the climate change committee but will step down early next year following its initial report at the end of 2008.[81]

a. Work to date

Defra launched a call for evidence towards the end of 2007 on the work streams the Committee intended to focus on. These were:

- Carbon Budgets
- Transport
- Carbon Markets
- Energy End-Use
- Emissions Projections (Energy)
- Greenhouse Gases (Non-Energy)
- Technology Path to 2020
- Budget Cost & Benefits
- Emissions Projections (Energy)
- Greenhouse Gases (Non-Energy)
- Technology Path to 2020
- Budget Cost & Benefits

Since then the Committee has published a consultation, in May 2008, on its intended workplan. The consultation closes on 20 June 2008:

> The Committee on Climate Change (CCC) has to provide recommendations on (i) whether the 2050 target should be 60% or higher; (ii) the level of the first three carbon budgets for 2008 – 2012, 2013 – 2017 and 2018 –2022; the third of these must be more than 26% below the 1990 level; (iii) the relative contribution to the emissions reductions which should come from the "traded" and "non traded" sectors (where "traded" here means subject to an emissions cap and trade system); (iv) whether and how international aviation and shipping should be included in targets and budgets; (v) whether targets and budget should be in CO_2 or in total GHG terms; (vi) to what extent the UK policy should allow for budgets to be met via buy-ins of credits from overseas. In reaching its recommendations, it must also take into account and analyse the implications of chosen targets and budgets for competitiveness, fuel poverty, government fiscal resources, security of supply specific regional effects, and ancillary environmental effects.
>
> Addressing these issues will require an iterative approach, with many complex inter-connections between scientific and economic analysis, between recommendations relating to 2050 and those relating to 2020, and between e.g. the resolution of the aviation and shipping issues and the other GHG issue, and the setting of the 2050 and 2020 targets. This workplan does not capture all of those inter-relationships, some of which will only become apparent as the analysis progresses. But it aims to

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[81] *Guardian*, 'Darling names ex-CBI chief Adair Turner to head City watchdog', 30 May 2008

provide a workable division of the analytical challenge into manageable blocks, and to identify the key considerations which will affect each set of recommendations. It is divided into 6 sections:

> **1.** Setting the 2050 target.
> **2.** Setting the 2020 CO_2 budget and the trajectory from now to 2020: what should the 2018-22 budget be, how much buy-in should be allowed, what balance between traded and non-traded sectors.
> **3.** Other considerations: fuel poverty, fiscal implications, security of supply, the regions and ancillary environmental effects. (Competitiveness is covered under workplan section 2)
> **4.** International aviation and shipping.
> **5.** Other greenhouse gases.
> **6.** An explanation of how the cross-cutting blocks of analysis, around which the work of the secretariat has been fed into the workplan sections.[82]

Full details of the workplan can be found on the Defra website.[83]

III Lords Stages

The *Climate Change Bill* received its Second Reading in the House of Lords on 27 November 2007. It then went to Committee of the Whole House from 11 December 2007 for eight sessions; followed by Report Stage for 4 sessions which began on 25 February 2008; and finally Third Reading on 31 March 2008.[84]

A. Second Reading

Lord Rooker, Minister of State, Department of Environment Food and Rural Affairs, introduced the Bill. He highlighted the degree of cross-party agreement on the general thrust of the Bill and said:

> The Bill is an unequivocal statement that the UK will do its part in the struggle against dangerous climate change and provides a framework to help us to adapt to its unavoidable impacts. It provides a clear, credible framework for our emissions reductions. The targets and budgets provide clarity for industry to plan and invest in moving towards a low-carbon economy and so reap the potentially large economic benefits.[85]

Lord Taylor of Holbeach, Opposition Spokesperson for Environment, welcomed the Bill:

> It is widely acknowledged that climate change represents the most important challenge of our time. We debate this issue knowing that we cannot afford to do nothing and that, even if we follow a strongly focused trajectory to reduce carbon emissions, we will see global warming in the forthcoming decades. This accounts for

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82 Defra website, Committee on Climate Change Workplan, [on 6 June 2008]
83 ibid
84 Climate Change Bill Page [on 6 June 2008]
85 HL Deb 27 November 2007 c1123

> our belief that government policy needs to be robust and that mitigation and adaptation are necessary lines of action that will lie at the heart of government policy.

He went on to highlight some of the areas where the Conservative Party would seek to strengthen and amend it:

> What drives our ambitions for the Bill? It must be the need to reduce global warming. This, in turn, is dependent upon scientific knowledge, scientific judgment and scientific prediction. That is why these Benches will seek to place science at the heart of the Bill. It sets a target of 60 per cent. The real goal is a 2-degree reduction in the likely rise of temperature. This will be achieved only by a global concerted effort, as the Minister pointed out. To do our part, perhaps in the hope of leading the way, we must ensure that the Bill is focused on the right way of setting up a durable and effective system.[86]

And:

> The Government have voiced their support for three major international agreements. All these have a higher ambition than the targets contained in the Bill. I refer to the Government's commitment to the G8, the Vienna climate talks and the European Council spring summit, and I expect that they will take a similar approach in Bali. However, seeing the 60 per cent target in the Bill, one senses a fundamental inconsistency right at the beginning of the process. I ask whether the Minister intends to change the targets during the passage of the Bill.
>
> In the mean time, we are in receipt of a mixed message from a Government who appear to acknowledge the advice they receive when it suits and not when it comes to doing something about it. That brings us to what we on these Benches consider to be a key deficiency in the structure of the Bill. I am sure that all sides of the House will accept that the effectiveness with which we will make progress in reducing carbon emissions, thereby protecting ourselves against climate change, lies in the balance between the scientific realities and the agency of government. We find the Government's creation of a Committee on Climate Change purely to advise the Secretary of State to be a wholly inadequate vehicle to bring science to the heart of this great endeavour.[87]

Lord Taylor went on to highlight areas where his party would be looking to change the Bill including the need for the Prime Minister, rather than the Secretary of State, to report to Parliament; the need for annual rolling targets rather than five yearly ones; the percentage of carbon credits that should be allowed to contribute to the overall target; and the inclusion of international aviation and shipping. Lord Taylor finished says:

> I hope that the contributions we make from these Benches make it clear that we wish to strengthen the Bill. If the Bill currently has a weakness, it is that it places far too much discretion in the hands of government, Ministers and politicians. However, that is not to say that those of us with responsibilities in these matters should not be prepared to rise to the task. In truth, this may well be one of the most important issues that we ever consider in this House.[88]

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86 ibid c1128
87 ibid c1128
88 ibid c1132

Lord Teverson, Liberal Democrat Spokesperson for Environment Food and Rural Affairs, began by welcoming the Bill as "the most important of this Session." However, he went on to say that "there are a number of areas where this Bill needs to become more fit for purpose".[89]

> Most climate scientists would agree that 60 per cent is no longer enough. I understand why the Government wish to put off a decision about changing the target until the Committee on Climate Change has considered it further, but we should surely not be in the position where the first clauses of the Bill contain a target that we know will not work and is not sufficient. We have either to move back to the objective of a maximum change of 2 degrees or to move the target to 80 per cent, which is what we should do. Liberal Democrats believe that it is possible to move to a carbon-neutral economy by 2050. I suspect that that would be difficult to deliver through an amendment in this House, but we believe that the target needs to be 80 per cent or in excess of that.

Lord Teverson highlighted other areas of concern such as the failure to include international shipping and aviation, or other greenhouse gases in the Bill. He also expressed concern about the provisions allowing for 1% of emissions to be banked or borrowed between budgets; the lack of a limit on the amount of international credits that could be purchased to meet targets; and the lack of powers for the Committee on Climate Change to assess and report on Government policies. He expressed the view that the five year budget periods set out in the Bill needed to be shortened.[90]

The Earl of Caithness supported the Bill but cautioned about using climate change to support inappropriate legislation:

> I am also concerned that climate change is a bit of a buzzword, as it is used by the Government to support any legislation that they think is appropriate. For instance, they used the issue of climate change to support the introduction of energy performance certificates in home information packs, but when those certificates were first mooted and imposed by Brussels climate change was not even mentioned. It is now said to be the cause of every single natural disaster, although those disasters are in fact caused by man's stupid greed and his ability to build in the wrong place.[91]

Lord Palmer was also cautious:

> My Lords, parts of me welcome the Bill and parts of me do not, as I feel that there is a touch of the emperor's new clothes about it. Climate change must be one of the most confusing and controversial topics today.

And

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89 ibid c1132
90 HL Deb 27 December 2007 c1134
91 ibid c1168

> The Government should concentrate on the energy needs of this country, about which they can do something, rather than nagging us continually about CO2 saving, which worldwide our Government can do virtually nothing about.[92]

Lord Redesdale highlighted the apparent unanimity within the chamber on the issue of climate change:

> It has been interesting today to see that no one in the debate has questioned whether climate change is taking place, which means we have moved on from a few years ago when I know at least a couple of Peers would have stood up and questioned it.[93]

B. Committee Stage

There were no changes to the detail of the Bill during the Committee Stage. However many of the probing amendments put forward during the Committee Stage were included during subsequent stages of the Bill either as Government or Opposition amendments.

The one significant change during this stage was the inclusion, unopposed, of three new clauses [Clauses 59-61] proposed by the Government which set out the non-devolved functions for reporting authorities. The reasons for including these new clauses were set out by Lord Rooker as follows:

> These amendments give the Secretary of State and the Welsh Ministers powers to issue guidance to reporting authorities, and to direct them to prepare reports on how the impact of climate change will affect their functions and how they will deal with the risks they identify. These amendments reflect the fact that climate change will affect a wide range of public services and critical infrastructure. We need to ensure that there is a mechanism to pick up on poor performance or new risks which are not being addressed. We also propose to issue guidance setting out common standards for assessing and addressing the risks of climate change. This will help to ensure greater consistency and robustness across organisations. While a lot of good work is going on to adapt to climate change, further provision is required to ensure that key services are protected, in a way that is proportionate and relevant to their work. Our amendments do just that.[94]

Reporting authorities were described in the new clauses as “a person or body with functions of a public nature” or “a statutory undertaker” and would “cover every critical public sector organisation, which means in excess of 25,000 bodies”.[95]

The only amendment which was put to a vote during Committee was a Conservative one put forward to change the name of the Committee on Climate Change to the *Commission* on Climate Change. This was defeated with 81 votes for and 171 against. The reason for the proposal was set out by Lord Taylor as follows:

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92 ibid c1190
93 ibid c1202
94 HL Deb 23 January 2008 c301
95 ibid

> A commission is a task or a duty derived directly from the authority of the Crown or statute. Thus it is exactly the right term for our purposes in this Bill. It reflects the role and function, status and authority, and independence of this key body.
>
> This change is not mere semantics and it is certainly not cosmetic. It would give its members the status of commissioners and create a public sense that this is not just an exclusively advisory body.[96]

In response for the Government, Lord Rooker expressed concerns that it represented an attempt to change the functions of the Committee:

> So far as the name is concerned—this is the advice I have received—there is absolutely no legal significance within the machinery of government in which it will operate or in the context of the Bill itself. I am almost saying that it does not matter; the argument might therefore be, "If it does not matter, do it". However, noble Lords have hung on the proposed change of name things other than a change of name. There has been an attempt to hang changes of functions, of authority and of power—those involve going beyond the advisory role on the change of name. On that basis, of course, it is not an argument that the Government can accept. We believe that referring to the organisation—it is a non-departmental public body—as a committee is perfectly fine and we do not consider the amendment would add anything of value.[97]

Following the Committee Stage Defra published details of the amendments it intended to make to strengthen various aspects of the Bill.[98]

C. Report Stage and Third Reading

1. Limiting global average temperature increase to 2°C

Amendment no 1 at Report Stage was tabled by Conservative and Liberal Democrats and now stands as Clause 1 of the Bill .

> (1) The principal aim of this Act is to ensure that UK emissions of greenhouse gases do not exceed the level necessary to contribute to limiting the global average temperature increase to not more than 2°C above pre-industrial levels.
> (2) The functions under this Act must be exercised with the objective of achieving the principal aim of this Act. [99]

A 2°C limit in temperature increase corresponds with Scenario I from the International Panel on Climate Change as set out below.

The reason for putting forward this amendment was summarised by Lord Taylor:

> Having a principal aim anchors policy around a central theme. This legislation creates a multitude of new powers and has a scope that will affect policymakers all over Whitehall. It must do that if it is going to succeed. Having the principal aim stated in

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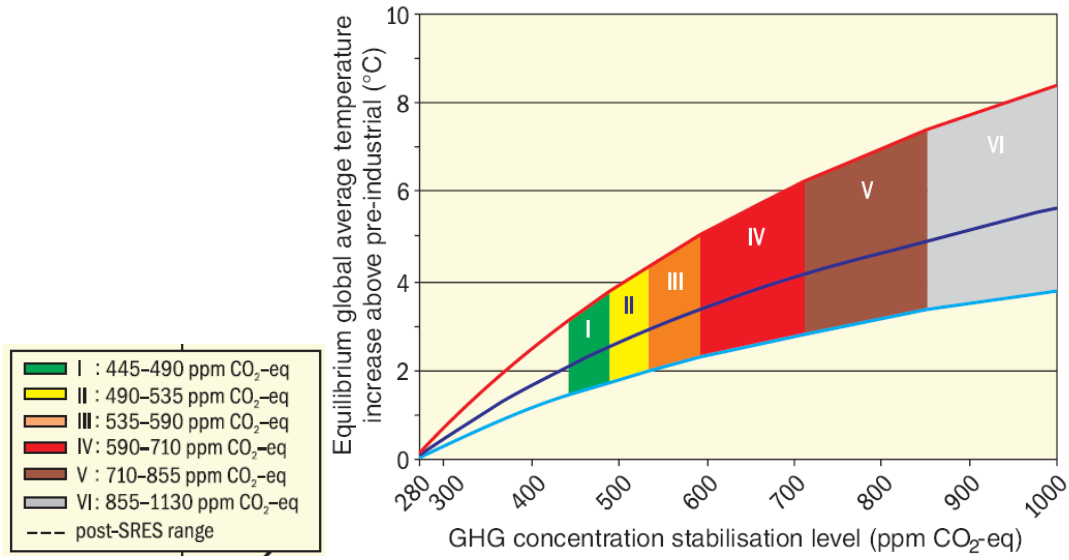
96 HL Deb 11 January 2008 c1064
97 ibid c1071
98 Defra, *Government proposals for strengthening the Climate Change Bill*, February 2008
99 Climate Change Bill [HL] Bill 97 of Session 2007-08, p1

the Bill will colour and shape the way that the Act works in practice. It is not intended to provide a test for individual decisions. Judges would not apply this as an applicable statutory test for individual cases. However, the amendment places a general duty that can be evaluated and has regard to [the] way in which the functions under the Act are exercised. This would certainly be a consideration in any judicial review challenging a particular decision or action.[100]

CO2 emissions and equilibrium temperature increases for a range of stabilisation levels[101]



Scenario I corresponds to stabilisation of carbon dioxide levels at 350-400 ppm and stabilisation of carbon dioxide equivalent at a level of 445- 490ppm. Emissions would have to peak between 2000 and 2015; global emissions would be reduced by between 85% and 50% by 2050. This scenario would result in a global temperature rise of between 2.0 and 2.4 ^{o}C. Sea levels would rise between 0.4 – 1.4 meters, although this only takes into account thermal expansion and not any rise attributed to ice melt.[102]

The latest measurement of global carbon dioxide concentrations in the atmosphere produced by the US National Oceanic & Atmospheric Administration were 380.90 ppm for 2006. Levels for 2007 were 382.66ppm. This compares to levels of 338.67 measured in 1980. The earliest measurement of carbon dioxide levels in the atmosphere was taken at the Mauna Loa station in Hawaii. Carbon dioxide levels were measured at 315.98 ppm in 1959. [103] The 2006 carbon dioxide equivalent concentration has been estimated by the European Environment Agency at 433 ppm CO2-eq. This estimate includes the six greenhouse gases covered by the Kyoto Protocol.[104]

Measurements of levels of CO2 contained in ice cores indicate that the pre-industrial carbon dioxide level was 278 ppm. That level did not vary more than 7 ppm during the 800 years between 1000 and 1800 A.D.[105]

Further information on trends can be found in Appendix 2.

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100 HL Deb 25 February 2008 c451
101 IPCC AR4 Synthesis Report, *Summary for Policy Makers*, November 2007
102 ibid p21
103 Dr. Pieter Tans, NOAA/ESRL, Trends in Atmospheric Carbon Dioxide - Mauna Loa [on 6 June 2008]
104 *Atmospheric greenhouse gas concentrations (CSI 013) - Assessment published Apr 2008*, European Environment Agency
105 NOAA website, *After two large annual gains, rate of atmospheric co2 increase returns to average NOAA reports* [on 6 June 2008]

Concerns were raised during the debate about the possibility that the science may in the future indicate this was too high or too low a target; and the difficulties that may arise if other countries do not make similar efforts.[106]

Lord Rooker, in his response to the proposed amendment, made the point that general purpose clauses are unnecessary in UK legislation because "we legislate by drafting clearly".[107] He also argued that the purpose of the Bill was already clear and that if the amendment was successful it would confuse the purpose of the Bill. He stated:

> The science on climate change tells us that there are major uncertainties in attempting to draw a direct line of causation between our actions in the UK and the rise in average temperatures across the world.[108]

He concluded:

> for technical reasons, the way in which the new clause is drafted could do more harm than good. I am sure that is not the intention of the noble Lord in proposing it and I ask him to think again.[109]

The proposed amendment was passed by 159 votes to 149.

2. A duty to prepare proposals and policies

Amendments were put forward both at Report Stage (Amendment 2) and Third Reading (Amendment 1) to create a duty to put policies in place to ensure the Government's proposals in the Bill were met. The amendment at Report Stage was put forward by the Earl of Caithness who stated that:

> The amendment would give clear legislative expression to the underlying purpose of the Bill, setting out its principal objective, goals and conceptual basis

Lord Rooker argued during Committee Stage that this was unnecessary and restrictive, and would lack clarity to impose such a duty:

> Ministers can say all they like about implementation, but a legal duty—this is what my note says—would be highly unusual in legal terms. On another point, the amendment would be very restrictive. If the Government were unable to implement one element of the plan—through, say, unforeseen events—they would be in breach of the law. The same problem would apply if evidence came forward supporting a change in policy approach. It is not intended—this is not to demean the Bill at all—that the programme should be drafted as a legal document. It is therefore likely that any duty to implement would raise questions about precisely what the duty is and what needs to be done in order to fulfil it, and it would be very difficult to determine whether the duty had

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[106] ibid cc452-54
[107] ibid c454
[108] ibid c456
[109] ibid c457

> actually been fulfilled. Legal duties need to be set out in a way that shows precision and inflexibility.[110]

In response to the point that what is now Clause 2 of the Bill includes a duty on the Secretary of State to ensure emissions are reduced by 60% by 2050 he said:

> That line was drafted so as to send a signal to the Civil Service; the noble Lord knows how the culture of Whitehall works. That is what Clause 1, line 1 [*now Clause 2, line 1*] is intended to do but, with respect, this is a slightly different issue. The duty to implement would create a risk that a Government might choose to limit the policies included in the report in order to avoid a requirement to implement those policies. This could create a barrier to transparent and ambitious policy-making.[111]

During the Report Stage debate Lord Turnbull, former head of the Civil Service, was critical of this approach and supportive of the amendment:

> I do not agree with the Minister's comments about the purpose being to make civil servants do something. Civil servants serve the Ministers of the day. Either that is binding on Ministers and civil servants or it is binding on neither. You cannot say that you are doing it to bind one and not the other.[112]

The amendment was withdrawn by the Conservatives and Government Amendment No. 50 (now Clause 13 of the Bill) which creates a duty to prepare proposals and polices for meeting carbon budgets "with a view" to meeting the 2050 target was passed unopposed. Lord Rooker set out how the clause would work within the Bill as follows:

> The overall effect of the Bill's existing framework, as a whole, goes a long way towards relating short-term government actions to the long-term target. In particular, there is already a legal requirement that budgets from this year onwards must be set with a view to meeting the 2050 target and proposals and policies must be published to show how we plan to meet each budget. The Bill's annual reporting framework will ensure that the Committee on Climate Change and Parliament have a role in scrutinising performance every year.

And:

> Amendment No. 50 […] will therefore place an additional duty on the Secretary of State to bring forward proposals and policies that, in his view, are sufficient to meet the carbon budgets for the periods for which the budgets have been set. These policies and measures should be developed with a view to meeting the target for 2050 and any subsequent targets that may be set.

The Earl of Caithness was not satisfied with this response:

> I am convinced that what my noble friend Lord Crickhowell and I are trying to do is right. I acknowledge that government Amendment No. 50 makes a small response to our concerns, but we have to consider Clause 1(1). It is unenforceable; it is a spin on

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[110] HL Deb 8 January 2008 c778
[111] ibid
[112] HL Deb 25 February 2008 c465

> the actual situation, which does not set a good example. In view of the government amendment, it is right that I should come back with slightly revised wording to take it into account.[113]

During Third Reading Lord Crickhowell put forward a revised amendment to Clause 2 to impose on the Secretary of State a duty to:

> prepare such proposals and policies (including the setting of five year budgets) as the Secretary of State reasonably considers will—
>
> > (a) ensure that the net UK carbon account for the year 2050 is at least 60% lower than the 1990 baseline, and
> > (b) enable the carbon budgets that have been set under this Act to be met

He explained as follows the reasoning behind the amendment:

> Clause 1 as it then was imposed a meaningless duty that was almost certainly unenforceable and that if we had any respect for the legislative process something better had to be put in its place. It seemed to me self-evidently absurd that any Secretary of State could be held responsible for the delivery of a target 20, 30 or 40 years into the future, particularly when its successful delivery would depend not just on the actions of government but also on the reactions of a host of individuals and organisations, not to speak of events beyond the control of government.
>
> The view that the clause would be unenforceable in the courts was widely held by those far better qualified than I am, and the joint pre-legislative scrutiny committee, of which I was a member, shared my scepticism.[114]

Lord Crickhowell also set out how his amendment could be implemented:

> Instead of trying to pin everything on the nation reaching its target in 2050, the amendment would create a duty to deliver everything that makes the objective possible. While a civil servant or a Minister is never likely to be held responsible for the non-achievement of the 2050 target, one can envisage Parliament and even the courts holding them responsible for the production of policies that are clearly in conflict with that objective.[115]

There was support from all peers who spoke on the amendment, including Lord Puttnam, Chair of the Joint Committee. In response, Lord Rooker reiterated how the Bill would function as it stood:

> The Bill's existing structure already provides a series of complementary duties. There is a clear outcome-focused duty to meet the 2050 target complemented by duties to make emission reductions on an ongoing five-yearly basis, and there are ongoing duties to develop policies. Taken together, that is a strong package of duties which focuses on the `process while maintaining the outcome in the Bill. The amendment would remove elements of the existing structure in Clause 2 and the outcome-

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[113] HL Deb
[114] HL Deb 31 March 2008 c744
[115] ibid c746

> focused duty that the clause currently provides. It does not add to the existing requirements. We do not see how that could be a desirable outcome in either legal or policy terms.[116]

The amendment was defeated with 130 votes in favour and 132 against.

3. Percentage target for 2050

The Liberal Democrats tabled an amendment to change the 2050 target from a 60% reduction in carbon dioxide emissions to 80%. The Government has made clear its view that the decision on whether the 60% target should be changed should be one of the first roles of the Committee on Climate Change. In this it has been supported by the Conservative Party:

> The Minister has told us that setting this target is an early task for the Committee on Climate Change. We believe that that target is best determined by the committee on the basis of the evidence and with its scientific evaluation. Our approach will lead to a more authoritative outcome, acceptable to Parliament and to the people of this country.[117]

Some speakers focused on the fact that a 60% target could be considered out of date. Lord Campbell-Savours stated:

> My view is that we should not refer to 60 per cent. It is a dangerous figure to put in the Bill. It would undermine the credibility of a Labour Government and it would send out the wrong message to NGOs. We have two options: either we put nothing in the Bill and leave it to the committee, or we put in a target of 80 per cent.
>
> I have consulted people in the trade unions on these matters. As my noble friend will know, the general view in the unions—particularly Unison, with which I have talked at length—is that a target of 80 per cent should be set. However, it might well be best—I take the view of the opposition Front Bench on this—to say nothing at this stage and leave it to the committee to decide. At the heart of my case is the belief that there should be no reference to 60 per cent. That figure is dangerous for our credibility.[118]

Lord Resdale set out the need to strengthen the target by setting it in law as the reason for putting forward the amendment:

> The real issue behind this, as we discussed at Second Reading, is whether the decision to go to 80 per cent should be taken by the climate change committee or in Parliament. It is an important point that we cannot get away from. I took on board the point made by the noble Lord, Lord Rooker, that the decision could be the first indication that the climate change committee had teeth. However, that is a real problem. We are talking in a legislative chamber about a target that looks very bland on a piece of paper—this is an extremely short amendment—but that will have massive implications for how everyone in this country lives their life, for how laws are formed and for how local authorities set their own targets for meeting this objective. It will have implications, both financial and personal, for many people and businesses

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[116] ibid c753
[117] HL Deb 11 December 2007 c175
[118] ibid c175

> throughout the country. Turning it over to a committee is a major problem. The committee is a worthy organisation, but does it undermine the political push behind the 80 per cent target if that target comes from the committee? The target might well be based on science, but we should not fool ourselves. It will take an enormous amount of political will power to meet this target, and for that to happen, it must be set by the Government.[119]

Lord Puttnam expressed the view that the amendment was inappropriate because "this is the golden opportunity for the climate change committee to establish itself."[120]

Lord Rooker said that until the Committee on Climate Change had carried out its review it would be premature to change the target to 80% or any other number. He went on to highlight the economic implications of changing the target:

> The Defra analysis, published alongside this Bill, suggested that a 60 per cent target could cost 0.7 per cent of GDP in 2050, while an 80 per cent reduction could cost between 1.1 and 2.6 per cent of GDP in 2050, depending on the assumed level of future technological change, fossil fuel prices and the availability of particular technologies. This is only an initial analysis. These are exactly the kind of questions that the Committee on Climate Change will need to look at. It demonstrates the seriousness of the issue.[121]

The amendment was defeated with 53 – 150.

4. Annual targets v indicative annual ranges

During Report Stage a Conservative amendment proposed annual targets to be set within the provisions for five yearly budgets contained in the Bill. The amendment also proposed rolling annual targets to be set every year for the following six years. The reason for the amendment was summarised by Lord Taylor as follows:

> We would like to think that any Secretary of State will busy himself with reducing emissions from day one of a budget period, but that will be difficult. There is the obvious problem that if there is no accountability within the five-year period, it will be very easy for a Government to blame missing a target on the previous Government, or to have decreased motivation for achieving a target if it seemed likely that the next Government would take the heat. If we are to ensure that reductions happen, there needs to be steady pressure and constant accountability.
>
> Objections were raised about the variations that can occur from year to year that may make numerical targets difficult to meet annually or give the wrong impression about the success or failure of an Administration's efforts. The rolling factor takes care of that. Each year, the following six years would have their annual targets adjusted, to take into account things such as cold winters, to ensure that the budgets are met on time. Likewise, the rolling factor can take into account successes that, by happy coincidence, occur in a Secretary of State's tenure. If a series of heavily polluting power stations were phased out at the beginning of a budget period, the Secretary of

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[119] HL Deb 25 February 2008 c469
[120] ibid c471
[121] ibid c473

> State could rest on his or her undeserved laurels and still achieve the budget without making any other serious attempts at tackling emissions.[122]

Lord Turnbull spoke to oppose the amendment and in support of the Government's proposed annual indicative targets. Lord Puttnam also spoke against the amendment, and in support of the Government, stating:

> I think that the Government have done very well. They have listened, and their Amendment No. 49 is not at all a bad attempt to deal with a tricky problem. All I would suggest to the Minister is that the term "indicative annual range" is a little broad. It would help enormously if that range could be narrowed to a point where people could have some confidence that it would be so, give or take 5 per cent either side of the range.

The Government's proposals were for a new Clause, now Clause 12 of the Bill, which requires the setting before Parliament of an indicative annual range of emissions for each year within a budget period:

> We had a detailed discussion in Committee on annual accountability, when I tried to explain the problems inherent in setting single-point annual targets, whether or not they were legally binding. We have looked again at the arguments presented in that debate, and it is clear that there is a good deal of common ground about what we are trying to achieve. That is to say, annual transparency and accountability about progress towards meeting the budgets are crucial for all of us, and some indication of the Government's expected trajectory for reductions over the budget period would help in providing this. It is important that there is no divide between any sides of the House on that.[123]

And

> The more fundamental problem with the opposition amendments is that we simply think that a single-point annual target does not work. It is too blunt and inflexible. Instead, the Government have tabled proposals that have at their heart government Amendment No. 49, which requires that the report on proposals and policies to meet budgets should include an indicative range for the trajectory of emissions over the budgetary period. We believe that the idea of an annual indicative range is superior to proposals for an annual single-point target. As I said in Committee, emissions can fluctuate from year to year for a variety of reasons, many of which, such as the weather, are out of the Government's direct control. There is also an inevitable uncertainty between the forecast of the impact of a given policy and actual emissions, again for reasons that may be beyond the Government's direct control.[124]

Lord Rooker was not able to put a figure on the range of these annual targets but did comment that "clearly a range will not fulfil its function effectively if it's so wide as to be meaningless". He went on to say:

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[122] HL Deb 25 Feb 2008 c493
[123] ibid c496

[124] ibid c497

> It is not possible at this stage to put a definitive figure on how wide the range will need to be because of these factors. However, we believe that we are looking at a variation in single-figure percentages overall. That is as accurate as we can get and is not pie in the sky. We are looking at single-figure percentages rather than tens of percentages. We cannot see that it would need to be a great deal wider than that. Obviously, I accept that that is a broad estimate and that more detailed work needs to be done.[125]

The opposition amendment was defeated on a division with 123 Contents and 143 Non-Contents. The Government's new clause was passed unopposed.

5. Emissions from international aviation and shipping

During Report Stage an amendment was put forward by the Liberal Democrats to include emissions from international aviation immediately within the scope of the Bill and emissions from shipping within three years. This did not have support from the Conservatives and was defeated by 169 to 52 votes.[126]

Following this Amendment 65 was tabled by the Conservatives to change the term emissions from "aviation or from international shipping" to "passenger travel and imports and exports of goods". At the same time Amendment 116 was debated which made provisions for regulations to deal with these emissions to be laid before Parliament within five years, or failing this for a report to be laid before Parliament to explain why regulations would not be introduced.

During the debate Lord Taylor set out the reasons behind the proposal:

> First let me explain the necessity of addressing this problem […] Not having a provision for the emissions caused by trade and transport is unjustifiable. If there is to be progress towards addressing climate change, these emissions need to be counted. The analogy constantly and aptly used is that it is like going on a diet but not counting the chocolate. To ignore trade and transport emissions is to ignore climate change.
>
> I know that the Bill has provisions to enable the Secretary of State to make regulations on aviation and shipping, but there is no duty for him so to do. Simply waiting around until the EU proposes a way of solving the problem or forces the UK to address it is, frankly, a bad way of governing. We appreciate that a lot of the regulation will require international co-operation and will depend on international agreements; that is the nature of the beast. However, if we truly intend to take a lead on climate change, we need to take a lead on addressing some of its biggest contributors. Therefore, our amendment would place a more positive duty: we specify that the Secretary of State must address these emissions in a five-year timeframe.[127]

Lord Teverson, speaking for the Liberal Democrats, supported the amendment but was concerned that it was "not as good as it could be". However, he considered it "better than the

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[125] ibid c498
[126] HL Deb 4 March c1000
[127] ibid c1014

Bill as it stands."[128] Lord Greenway did not support the amendment because in his view it would be a great mistake to include shipping "before some kind of international agreement can be reached". The Earl of Selborne supported the amendment because in his view it set a realistic timescale and it recognised the need to allow passengers to travel by the least carbon-emitting method.

In his response Lord Rooker expressed some level of support for the amendment:

> I appreciate the spirit of the noble Lord's amendment. […] it is trying to address the practical problems we looked at in Committee. We accept that. For the most part, the amendment grapples with precisely the same issues that I understand the Government grappled with when drafting the clause in the first place. I agree that one possible way of including the emissions in the Bill is through the categorisation described in the amendment; that is, passenger travel or freight.
>
> I assure the House that Clause 25 is drafted sufficiently widely that, should we decide that the amendment is the most appropriate way forward—I have indicated that it has a lot going for it—it would be perfectly possible to define the emissions in the way that the noble Lord suggested. However, there could be practical problems—we will find this all the way through not just the Bill but also the way in which we operate the policies—in relation to transport carrying both passengers and freight[129]

He also went on to highlight concerns about the five year deadline included in the proposed clause:

> As we have already discussed, the problem with setting any arbitrary deadline, which is what the five years proposed by the amendment is, is precisely that: it is purely arbitrary. We need to have a better reason for having a deadline that might cause us problems. We do not want to suggest to our partners in the international negotiations that we are being driven by an artificial domestic deadline rather than a desire to achieve the right global solution, which could cause a problem for our credibility in negotiations. To avoid that risk, we are looking, as we indicated in response to the previous amendment, to maintain as much flexibility as possible to include these emissions when the context is right.
>
> However, I assure the House that we will not delay. When it is possible to move forward, we will do so.[130]

He finished by promising "a genuinely transparent process":

> I can confirm that the Government would be happy to provide regular information to Parliament on progress in the European and international discussions on international aviation and shipping. This should provide greater transparency.[131]

The amendment was put to a vote by Lord Taylor and was carried by 191 votes to 141.

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[128] ibid c1016
[129] ibid c1021
[130] ibid c1022
[131] ibid

Further details on the impacts of aviation and shipping can be found in Library Note SN/SC/4519 on *Shipping Emissions* and Research Paper 08/08 on *Aviation and Climate Change*.[132]

6. 30% limit on international credits

The provisions contained in the Bill as drafted by the Government, under Clause 34, create a duty for the Committee on Climate Change to advise the Secretary of State on the extent the carbon budget for a period should be met by domestic carbon reductions. A Liberal Democrat amendment was put forward, with support from the Conservatives, to set a limit on the amount of international credits used to meet the targets contained within the Bill to 30% of the total budget. Lord Teverson introduced the amendment:

> My Lords, we come to an important principle in the Bill: the Government's concept of the UK carbon account. As noble Lords will know, that does not target actual UK emissions but UK net emissions plus or minus the trade in carbon permits from abroad, whether through the European system or some of the other Kyoto mechanisms. The amendment is intended to put a limit on the number of those foreign credits included in the UK carbon account.
>
> I want to make it quite clear, as I did in Committee, that all noble Lords on all sides of the House are absolutely committed to emissions trading systems. In no way does the amendment inhibit the actual trading of permits internationally, particularly within the European Emissions Trading Scheme.[133]

And

> Because this is such an important principle, it needs to be in the Bill. It has to be clear in the Bill that there is a limit to the amount of decarbonisation of the UK economy that can take place by subcontracting it to the rest of the world while we carry on emitting carbon dioxide and the other greenhouse gases to our heart's content, to any degree that we want, as long as, somehow, by the end of the budget period, we fix that by purchasing credits from abroad. That is not what the Bill is about.[134]

Lord Taylor speaking for the Conservatives, whilst supporting the amendment, made it clear that this was because the Government had failed to put forward any preferable proposals to limit the use of credits:

> A fixed percentage in the Bill may not be the best way of going about that. We understand the difficulties in placing such a precise figure in the Bill, which range from the constraints of the international negotiation tables to the fact that the carbon market will look a lot different in 42 years. However, a 30 per cent limit on the contribution to the reduction commitment is fairly broad and it is the best course of action in the absence of anything from the Government. The Minister said that he envisaged the Committee on Climate Change addressing these issues. That fits into our general approach towards the Bill and the role of the committee. However, we would like the committee to have a specific duty under the Bill to set a figure capping

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[132] Library Research Paper, 08/08, Aviation and Climate Change, January 2008
[133] HL Deb 11 Mar 2008 c1405
[134] ibid

> overseas credits. Should the Government bring something to that effect forward at Third Reading, we would be willing to reconsider our position on the amendment.[135]

The amendment was also sponsored by Lord Puttnam, chair of the Joint Select Committee. He called it "the most important debate, because it goes to the heart of the overall rationale for the Bill". He went on to state:

> Leaving the whole thing to the climate change committee is an attractive option but, as the Minister has reminded us on any number of occasions, these essentially political decisions should remain with Parliament. This is a defensibly consistent and principled position, but it results in the need to clarify to the greatest degree possible an appropriate cap and to put it into the Bill. Surely there can be no decision more political in effect than constraining the way in which people live their lives. In essence, given the Bill's present form, the Government are seeking to persuade us simply to trust them to do the right thing. That indicates that those who drafted the Bill do not get out too much.[136]

He went on to call the clause, as it was then drafted, a "get out of jail free" card. Lord Crickhowell put forward the view, in support of the Government, that there were doubts about setting a binding limit as it would risk being seen to undermine investment flows in low carbon technologies to developing countries.

Lord Turner, who has been appointed as chair of the Shadow Committee on Climate Change, also spoke during the debate. He did not support the amendment, although he made clear he sympathised with its aims:

> My sympathy is based on the fact that it is essential that the UK achieves cuts in its own emissions and does not rely on what the noble Lord, Lord Puttnam, has called the delusion of a get-out-of-jail-free card. That is important because it is vital that developing countries in total illustrate to the world what a low carbon economy is and what changes in behaviour, energy efficiency and the lower carbon sources of energy will be required for the whole world to achieve a low carbon economy and thus emission reductions.
>
> Indeed, the fact that we need to demonstrate that supports the argument of the noble Lord, Lord Puttnam, that it is not absolutely the case that a tonne of carbon saved in every country of the world is precisely the same. There is a value in hard emission reductions targets in developed countries because they will drive the changes in behaviour, energy efficiency and technology which will then be required across the whole world.
>
> It is important to realise that in the long term, when we look at the 2050 target, we probably have to work on the assumption that all of the emission reductions we will aim to achieve by 2050 will have to be achieved through domestic effort—not 90 per cent, not 95 per cent, but all. That is because by that time, all countries in the world, including those that are currently still at a low-income developing stage, will have to be on a strong downward emissions path. [137]

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[135] ibid c1407
[136] ibid c1409
[137] ibid c1411

With regard to the specifics of the amendment he stated:

> This is an appropriate issue to be handed to the Committee on Climate Change for detailed consideration and the provision of a robustly independent recommendation on the issue. However, I realise that my own confidence in the robust independence of the committee is based on insider information and that other noble Lords cannot, by nature, be so confident. I also recognise that even if the committee recommends a certain approach, government could choose not to accept that recommendation. I therefore recognise that noble Lords may wish to ensure that there is something in the Bill which makes sure that the level of domestic effort is significant.
>
> However, I am concerned that, as written, the specific form of the amendment is not the best. It could have some unintended consequences, because it does not set a minimum level of UK domestic effort—it sets a minimum percentage.
> […]
> If it defined an absolute minimum reduction in the domestic amount, rather than a percentage of the total reduction, it would be more effective.[138]

Lord Desai raised concerns during the debate about creating a too rigid a framework that would lead to misallocation of resources. Lord Dearing expressed the view that "to have a moral influence in the world, we must be seen to be working hard to reduce our own emissions". He was not in favour of stating a figure in the Bill "however, it goes too far to leave it entirely to the Committee".[139]

Lord Stern of Brentford, in his maiden speech to the House, argued that restricting reductions to domestic emissions could constrain the overall reductions achieved:

> My concern is that the amendment as expressed is, for the reasons which my noble friend Lord Turner described, likely to constrain ambition, when ambition is of the essence here. As he argued, it could result in the setting of overall targets that are too low. In the context of a global deal and the negotiations towards the end of a global deal, it could constrain us in upping the kind of percentage reduction we are looking for because we would understand that a particular reduction domestically would be just too difficult for to us make over the next five or 10 years.[140]

He called for the Government to refer the issue to the Committee on Climate Change as intended in the Bill.

Baroness Young, Chief Executive of the Environment Agency which is responsible for administering the EU emissions trading scheme (ETS), spoke in support of the amendment. In her view it did not get in the way of trading "if you have a bigger proportion of the carbon reduction coming from the UK economy". This was because "there are bags of scope here in the UK for our energy to be decarbonised and for there to be in fact little need to resort to the

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[138] ibid c1413
[139] ibid c1414
[140] ibid c1416

mechanism of the trading system".[141] She went on to set out the need for an incentive to improve carbon reduction technologies domestically:

> What we want is people buckling down and tackling the job of reducing their own emissions, not simply because it will be important for climate change but because, frankly, it will get embarrassing, globally, if many countries across the world are beginning to develop a head of steam in the new carbon reduction technologies and we are failing to do so. In the interests of our domestic industry in opening up innovative products and creating new global markets that we are there in front of, not straggling along behind, it is pretty important that we get the initiative to decarbonise the UK economy moving far faster than it has done so far.[142]

Commenting that the Bill was not sufficiently strong because "the default position will be for trading rather than for domestic reduction", she urged the Government to explore the possibility of an amended version of the proposal during Third Reading. The amendment was agreed to by 179 votes to 147.

During Third Reading no further amendments were proposed by the Government and Lord Rooker stated that "it is right to leave it to the other place to consider".[143] An amendment was put forward by the Conservatives to make clear that the intention was not to limit the amount of credits that could be purchased, only to limit the amount that could count towards meeting the carbon budget. The amendment was withdrawn.[144]

7. Adaptation Sub-Committee

The Bill contains a duty for the Government to present to Parliament five-yearly assessments of the risks to the UK of climate change, together with a report setting out objectives for adaptation to these risks. The Bill was amended during Report Stage by the Government to include a duty to report on progress on adaptation.

Also during Report an amendment was put forward, supported by Conservatives and Liberal Democrats, to create a Climate Change Adaptation Sub-Committee. The Committee would have the duty to provide advice on the adaptation programme and assess the reports produced by the Government on adaptation, and assess the contributions of any measures to sustainable development. In presenting the amendment Lord Teverson stated:

> The Bill provides for sub-committees of the climate change committee but is not specific about them, nor about who should be on them or what subjects they should tackle. We think that there should be a sub-committee specifically concerned with adaptation and that it needs to be separate from the committee because the subjects that it will tackle, its goals and the assessments it will need to make require very different skills than those required to tackle mitigation. Therefore, while we adopt a holistic approach in bringing mitigation and adaptation together under the climate

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[141] ibid c1418
[142] ibid c419
[143] HL Deb 31 March 2008 c760
[144] ibid c758

> change committee, it is very important to have a separate sub-committee to tackle adaptation.[145]

Lord Taylor also spoke in support of the amendment:

> The primary aim is to stop [climate] change by cutting down emissions but this goes hand in hand with the impact on the environment that climate change brings. Thus, recognising the immense burden placed on the Committee on Climate Change as well as the importance of programmes and measures to adapt to climate change, these amendments create a sub-committee to focus on these issues. Its duties would include assessing the risks of climate change and providing proposals to mitigate these risks. By having a sub-committee devoted to adaptation, we can be sure that these issues do not become exiled from climate change proposals.[146]

Lord Puttnam, was strongly supportive of the proposal citing the example of the success of Ofcom as a comparison.

Baroness Young also supported the amendment and expressed disappointment that following the debate during Committee Stage on the subject the Government did not put forward their own amendment for Report Stage. Lord Crickhowell also spoke in support of the amendment and concluded:

> The fact that the chief executive of the Environment Agency and the former chairman of the National Rivers Authority are in total agreement on this point ought to be considered by Ministers as having some significance.[147]

In his response Lord Rooker set out the reasons why the Government did not consider advice on adaptation measures should form part of the role of the CCC:

> There are several reasons why the committee or any sub-committees are not the right bodies to deal with adaptation. First, it is wrong to assume that a body with one type of scrutiny function should naturally be given another. Secondly, the committee could become unwieldy and unfocused if its remit were significantly expanded to take on adaptation responsibilities. The amendment proposes a new sub-committee with a whole new set of members. That is the point I am making: we are talking about additional groups of people. Proposed new sub-paragraph (3)(j) in Amendment No. 131 says that the sub-committee should include expertise in "any other ... adaptations required". This, of course, could cover every sector of society and the economy. It could become quite unwieldy.
>
> Thirdly, we have discussed on a number of occasions whether the Committee on Climate Change should have a role in policy. The Government have argued strongly that it should not, as this would damage its impartiality and credibility as a technical-expertise independent body in its role of advising on targets and tracking progress against those targets.[148]

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145 HL Deb 11 March 2008 c1439
146 ibid c1440
147 ibid c1442
148 ibid c1444

And:

> We did not want it to be politicised. We are now discussing amendments which would require the Committee on Climate Change to assess the adequacy of government programmes and the contribution of government policies. There is a contradiction here and I have no doubt that the noble Lord will explain that in due course. He could, of course, explain it by withdrawing the amendment. Our view is that, whatever happens, we must not undermine the credibility of the Committee on Climate Change as a body focused on the science. We emphasise that. It is focused on the science, rather than on any of the political aspects.[149]

The amendment was put to a vote and agreed to by 160 votes to 137.

8. Trading schemes

An amendment was put forward by Lord Woolmer to remove the possibility of introducing personal carbon allowances using legislation within this Bill. However Lord Rooker rejected this on the basis that:

> We would prefer not explicitly to rule out personal carbon trading for now—in relation to this Bill—for two main reasons. The first is that the initial pre-feasibility work has not yet reported; and the long-term framework of the Bill means that personal carbon trading in future may represent a useful tool.[150]

He went on to give a commitment that secondary legislation powers in the Bill would not be used to introduce personal carbon trading by stating "I make it absolutely clear that personal carbon trading will not be introduced through the Bill".

Since then Defra has published its feasibility study. According to Defra this is a policy that they will not be taking forward at the moment:

> The study indicates that personal carbon trading has potential to engage individuals in taking action to combat climate change, but is essentially ahead of its time and expected costs for implementation are high.
>
> The Government remains interested in the concept of personal carbon trading and, although it will not be continuing its research programme at this stage, it will monitor the wealth of research focusing on this area and may introduce personal carbon trading if the value of carbon savings and cost implications change. [151]

The Environmental Audit Committee published its report on *Personal Carbon Trading* on 26 May 2008. In this it expressed disappointment with the Government's decision:

> Personal carbon trading could be essential in helping to reduce our national carbon footprint. Further work is needed before personal carbon trading can be a viable policy option and this must be started urgently, and in earnest. […]

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[149] ibid
[150] HL Deb 18 March 2008 c153
[151] Defra Bulletin 135/08, *Personal carbon trading evaluation published*, 8 May 2008

> We regret that, following its pre-feasibility study into personal carbon trading, the Government has decided to wind down its work in this area on the grounds of high implementation costs and public resistance to the concept. We recognise the extent of these challenges, but we believe that work on personal carbon trading must be continued in earnest if these difficulties are ever to be overcome. Although we commend the Government for its intention to maintain engagement in academic work on the topic, we urge it to undertake a stronger role, leading and shaping debate and coordinating research. Without action of this kind it is unlikely that personal carbon trading could become a viable policy in the foreseeable future.[152]

9. Emissions reporting by listed companies

Section 417 of the *Companies Act 2006* provides the option for quoted companies to report on environmental matters but does not make it obligatory. Neither the Act nor the Explanatory Note mentions carbon emissions specifically.

> (5) In the case of a quoted company the business review must, to the extent necessary for an understanding of the development, performance or position of the company's business, include—
>
> (a) the main trends and factors likely to affect the future development, performance and position of the company's business; and
>
> (b) information about—
>
> (i) environmental matters (including the impact of the company's business on the environment),
>
> (ii) the company's employees, and
>
> (iii) social and community issues,
>
> including information about any policies of the company in relation to those matters and the effectiveness of those policies;…

The Explanatory Notes for the Act summarised the provisions as follows:

> Subsection (5) specifies information that quoted companies in particular must include in their review where necessary for an understanding of the company's business. Where directors of quoted companies have nothing to report on environmental, employee, social and community matters or essential contractual or other arrangements, their review must say so. Subsection (7) exempts medium-sized companies from reporting non-financial key performance indicators – an exemption allowed by the EU directive[153]

Although there has been an increase in the number of listed companies reporting on their carbon emissions since the Act came into force there have been concerns about the low level of reporting and the lack of a standardised method of accounting, as set out in the following article:

> UK's top companies are failing to act on climate change as less than half of the FTSE 350 companies have introduced schemes to reduce greenhouse gas emissions, according to a newly released report.

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[152] EAC Report, Personal Carbon Trading, Fifth Report of Session 2007-08, 26 May 2008, HC 565

[153] The *Companies Act 2006*, Explanatory Notes

> The second annual report from the Carbon Disclosure Project (CDP), a New York-based independent organisation which works with shareholders and corporations to disclose their greenhouse gas emissions, found only 38% of the companies responding to its survey had established reduction schemes with targets for carbon emissions, now a financially material commodity with an economic and financial value.
>
> The report findings have prompted a coalition of leading environmental agencies, UK companies and cross party MPs to write an open letter to Hilary Benn, the environment secretary, and John Hutton, the business and enterprise secretary, calling for standardised carbon reporting.
>
> Adrian Wilkes, chairman of the Aldersgate Group, which wrote the letter, said the lack of transparency obscured the UK's true contribution to carbon emissions and would impede the setting of accurate carbon targets and budgets in the proposed climate change bill.[154]

An amendment requiring companies to produce a business review to include a report on their greenhouse gas emissions was proposed by Baroness Northover during Third Reading in the Lords. This was accepted unopposed by the Government and stands as Clause 80 of the *Climate Change Bill* as it comes to the Commons.[155]

Baroness Northover put forward the reasoning behind the amendment as follows:

> Amendment No. 9 states that those companies which are required to report on their environmental impact should include in that report information on their greenhouse gas emissions. Simple and non-controversial enough, you would have thought, and something which might be considered to be implicit in any environmental impact report. But we know it is not. Many companies do, or plan to do, this, but others do not. We seek to bring them up to the same standard. For companies which do not have this responsibility, we have a provision for the Secretary of State to guide on it. That is what this amendment is about. It is about being specific about something which is already supposed to be happening.[156]

An article in *The Independent* suggested that the amendment may be retained in some form:

> **Companies will have to tell all on carbon emissions**
> Backbenchers and green groups force Government to impose tougher climate-change reporting requirements on quoted firms. All quoted companies will be forced to detail carbon emissions in their annual reports after the Government caved in to backbench pressure.
>
> An amendment added to the Climate Change Bill last week is expected to go on the statute books this summer. It requires quoted companies to include carbon emission information as part of their annual business reviews. These would list emissions from company cars, boilers and on-site equipment.

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154 BussinessGreen.com, 'Top FTSE companies fail to account for their carbon emissions', 15 October 2007
155 HL Deb 31 March 2008 c764
156 ibid

Lord Rooker, the environment minister, bowed to pressure from a coalition of backbench MPs and non-governmental organisations – among them Christian Aid and the WWF – to include the amendment at the end of the third reading in the House of Lords.

However, there is criticism that the amendment will add to what some see as the burden of regulation on British business. Alan Duncan, Conservative spokesman for business, enterprise and regulatory reform, said that it was "heavy-handed bureaucracy".

Mr Duncan added: "The idea of carbon reporting sounds a good idea but we don't currently have a standard auditing process for carbon. So until such a mechanism is established, it's impossible to expect businesses to comply – particularly smaller businesses that are already overwhelmed by heaps of red tape."

But the coalition between backbench MPS and other bodies argued that existing requirements on environmental reporting were too weak. Under the Companies Act, quoted companies have a responsibility to provide a business review alongside their annual reports. This should include information on the environmental and social impacts of their work, if any, but the amount of information is at the company's discretion.

Eliot Whittington, political adviser at Christian Aid, said: "We want government to make environmental reporting mandatory, not voluntary. The level of reporting is a power we want the Government to control."

Mr Whittington said that about 90 per cent of current reporting was satisfactory, but added that it was vital to capture that last 10 per cent.

Jon Trickett, a backbench Labour MP who has championed the amendment, added: "Corporations have been allowed to get away with green-washing their annual reports for too long."

The CBI said on Friday in response to the news that although it endorsed mandatory reporting and would like to see it implemented by 2013, the definition of carbon emissions was not sufficiently developed for the move to be introduced this year. Many businesses are not going to like the obligations.

The Bill will be presented to the Commons later this month. The Government could drop the amendment but a Whitehall source suggested this was unlikely as it would be seen to be "highly embarrassing". [157]

10. Other successful opposition amendments

- An amendment placing the duty to report to Parliament on the Prime Minister, rather than the Secretary of State. This was voted through with 194 votes for and 143 against.
- A proposal for the Environmental Audit Committee to examine the Secretary of State's report on the impacts of climate change. This was agreed to unopposed by the Government.

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[157] *The Independent*, 6 April 2008

11. Government amendments

The main amendments put forward by the Government during Report Stage and Third Reading were as follows:

- The Bill has been amended to require the Committee to publish its advice to Government as soon as practicable. It now also requires the Government to publish an explanation if it decides not to follow the Committee's advice on carbon budgets, amending targets, a baseline year or the definition of a targeted greenhouse gas.
- Government must publish proposals and policies to address a budgetary excess as soon as practicably possible after a budgetary period has ended. Clause 18.
- The upper limit of 32% reduction in emissions for the 2020 interim target was removed.
- Increased provisions on reporting to include all greenhouse gases not only those included in the target (currently just carbon dioxide).
- A budget for a period may not be amended once that budget period is over, as originally proposed. This means that budgets cannot be amended retrospectively. Clause 22.
- Allowing for the reporting retrospectively of emissions of targeted greenhouse gases other than carbon dioxide. Clause 24.
- A provision that experience within the CCC on climate policy should be at national and international level, and that in addition to climate science there should be experience of other branches of environmental science (Schedule 1). Some members would have preferred to see reference to 'international development' instead.[158]
- An amendment during Third Reading to make clear the scope of the Committee to commission and publish its own research:

> the Committee on Climate Change may do anything that appears to it necessary or appropriate in relation to any of its functions. That includes gathering information and carrying out research and analysis, and commissioning others to carry out such activities. Importantly, this also includes publishing the results of all such activities, if the committee so desires, so that information can be made public and openly debated. For instance, in providing its advice on budgets and targets, the committee will need to carry out an in-depth analysis of the potential for reducing emissions across the economy and rationally presents the costs, benefits and other impacts of doing so. It is also now required to advise on the sectors in which there are particular opportunities to reduce emissions and to publish the reasons for its advice.[159]

[158] HL Deb 4 March 2008 c1434
[159] HL Deb 31 March 2008 c761

12. Other amendments debated

- To set a time limit of three months for the Secretary of State to publish an action plan to address an excess in the carbon budget. Currently the Bill states that this must be done as soon as reasonably practicable. [160]
- A mechanism for setting targets for particular sectors of the economy.[161]
- Carbon budget only being set if it is in accordance with the recommendations of the CCC and approved by resolution by both Houses.[162]
- An amendment to amend the role of the CCC to decide upon carbon budgets rather than advise on them.[163]
- A proposal that the CCC should have to take circumstances at an international level into account "particularly with respect to poverty reduction."[164]
- A Conservative amendment to reduce the amount of banking and borrowing of emissions between budgetary periods from 1% to 0.5%. During debate Lord Rooker stated that the 1% was consistent with "the rise of emissions that may result from an unexpectedly cold winter or uncertainty surrounding emissions data".
- An amendment proposed by Lord Dearing would have allowed the CCC to provide advice or assistance on its own initiative. In response Lord Rooker stated that the CCC would be free to do anything as long as it was linked to its function.[165] Clauses 33 to 37 set out the functions of the Committee as follows:

    - Advice on the level of the 2050 target
    - Advice in connection with carbon budgets
    - Reports on progress
    - Duty to provide advice and other assistance on request from national authorities

13. Timings of reports and budgets

The Bill makes provision for five-yearly carbon budgets, the publication of annual indicative targets and reports to Parliament by both the Government and the CCC.

The timing for publications of budgets is as follows:

- Budgets for 2008-12, 2013-17 and 2018-2022 must be fixed by 1 June 2009. Further carbon budgets must be set at least 12 years in advance. Clause 5.
- The CCC must provide its advice on whether the 2050 target should be amended and the level of the first three budgets by 1 December 2008. Clause 33, 34.
- The Committee must report yearly on progress towards meeting budgets and set out its views on how the budget was met, and actions taken. The first report must be published by 30 September 2009, and on 30 June after that.

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160 HL Deb 25 February 2008 c526
161 HL Deb c518 ibid
162 HL Deb c537 ibid
163 HL Deb 11 March 2008 c1454
164 HL Deb 4 March 2008 c982
165 ibid c1493

The exception is the report published on the second year after end of a budgetary period which must be published by 15 July. Clause 35.

- The Government must respond to the first Committee's report by 15 January 2010. After that its response must be made on 15 October of the same year the report is published. Clause 36.

Further detail of how the reporting system would work in practice was set out by the Minister during Report Stage, when proposing several amendments:

> For each budget period the Secretary of State must publish proposals and policies for meeting each budget. Government amendments now agreed by this House also require the Secretary of State to publish an indicative annual statement setting out the progress expected in each year of the budgetary period, together with the timescales over which policies are expected to take effect. There will be maximum transparency about the progress expected, both on policies and on our emission reduction trajectory, throughout the budgetary period. I honestly do not see what further information could be provided on this. That is looking forward.
>
> Clause 12 [now Clause 15] requires the Government to publish, for every year of the budget period, a detailed emissions statement. This will set out the facts on how much progress is being made. Every year the Committee on Climate Change will lay a progress report before Parliament under Clause 28 [now Clause 35] which will give the committee's views on the progress being made towards meeting the budgets and the 2050 target, and then the Government must respond under Clause 29 [now Clause 36]. So if there are any concerns about progress during the budget period, there are already extremely strong mechanisms to make sure that they are identified at an early stage and reported quickly and transparently to the public and to Parliament[166]

Clause 28 if amended would mean the Committee's annual report:

> must refer to progress made so far towards meeting the targets and budgets, to progress that remains to be made and whether, in the committee's view, the targets and budgets are likely to be met. In making this assessment the committee will of course be able to use the information provided in the Government's plan for meeting budgets and the timescale for expected progress[167]

And

> Amendment No. 157 builds on this by requiring that the Government's annual response to the committee's progress report under Clause 29 [now Clause 36] would be specifically required to respond to the points made by the committee.[168]

Finally the Minister said:

> We need to be clear that when we are asking the Committee on Climate Change—as we have all agreed, an extremely important and high-profile committee—to make an

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[166] HL Deb 11 March 2008 c1467
[167] ibid
[168] ibid

> assessment of whether the government targets are likely to be met, we are asking that committee to use all its expertise, and we have debated in great detail what that expertise should be, to make that assessment.[169]

The amendments were welcomed by both Conservatives and Liberal Democrats, and agreed to without a vote.

IV Devolved Administrations

In its response to consultation and scrutiny Defra set out how the *Climate Change Bill* would work in practice with regard to the Devolved Administrations:

> The devolution settlement with respect to climate change policy is complex: while elements of energy policy (Generally energy policy is not reserved for Northern Ireland) and international relations are reserved matters, environmental policy is devolved, to varying degrees, to each of the Devolved Administrations. To reflect this devolution settlement, the UK Government and the Devolved Administrations have agreed that:
>
> - the Committee on Climate Change will be set up as a jointly-sponsored body, and its membership as a whole will include an understanding of the differences across the UK and the devolved context of climate change;
> - in establishing carbon budgets, both the Committee and the Government will need to take into account the differences across the UK;
> - the Government will consult the Devolved Administrations prior to taking decisions on targets and budgets under the Bill. The period for consultation will be specified in the Bill, to ensure that the Devolved Administrations have sufficient time to consider the Committee's advice and participate fully in the decision-making process. The Secretary of State will remain ultimately responsible for meeting the targets and carbon budgets under the Bill; and
> - the enabling powers under the Bill will be available to all four administrations to establish trading schemes within their existing competence, and for trading schemes to be set up jointly by more than one administration.
>
> 6.4 These provisions will be backed up by a strong Concordat, which will set out the roles and responsibilities of the different administrations in more detail. The Concordat will be finalised once the Bill has completed its passage through Parliament, and will demonstrate further how all four countries of the UK are committed to working in partnership to reduce greenhouse gas emissions and tackle climate change.[170]

1. Scotland

The Legislative Consent Memorandum (LCM) published in November 2007 by the Scottish Government set out how the *Climate Change Bill* would impact on Scotland and the reasons for it:

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[169] ibid c1468

[170] Defra, *Taking Forward the UK Climate Change Bill: The Government Response to Pre-Legislative Scrutiny and Public Consultation, Cm 7225*, October 2007

> • ensure that Scottish Ministers are consulted on amending the 2020 and 2050 UK carbon emissions targets and on the setting and amending of the five-year carbon budgets which will set the path to reaching these targets;
> • give the Scottish Ministers powers (within devolved competence) to set up trading schemes relating to greenhouse gas emissions;
> • ensure that the Committee on Climate Change advises all UK administrations on the UK emissions reduction target;
> • give the Scottish Ministers the power to request advice from the Committee on Climate Change in relation to Scottish emissions targets;
> • give the Scottish Parliament the power to call members of the Committee on Climate Change as witnesses; and
> • ensure that the Committee on Climate Change submits reports to the Scottish Parliament or to the Scottish Ministers at the same time as to the UK Parliament or to the Secretary of State.
>
> 6. The key elements of the framework listed above (introduction of targets and carbon budgets, establishment of an advisory committee, creation of enabling powers and reporting duties) are all capable of being exercised within the legislative competence of the Scottish Parliament so far as they apply to Scotland. The purpose of the Bill is, however, to introduce targets and a framework for action in the UK as a whole which is, of course, not within Scottish competence. Because much of the content of the UK Bill, so far as it relates to Scotland, is within our legislative competence, an LCM is required for almost the entire Bill.

The Scottish Parliament also intends to produce its own Climate Change Bill. The aim of this Bill is to be a driver for devolved climate change policies. The Scottish Government intention is to go further than the UK and legislate for an 80% emissions reduction in all six major greenhouse gases (including carbon dioxide) by 2050. The proposals were put out for consultation, which closed in April 2008. The intention is to publish the analysis of responses during the summer, with the Bill being presented to the Scottish Parliament by late 2008.

2. Wales

The publication of the *Climate Change Bill* was welcomed by the Welsh Assembly in a Press Release which also set out how various measures would be implemented in Wales:

> The Bill, which outlines a framework for moving the UK towards a low-carbon economy, sets a statutory target of a 60% reduction in CO2 emissions by 2050.
>
> A number of measures in the Bill will relate specifically to Wales including:
>
> - a clause requiring the Welsh Ministers to lay before the Assembly a report on their actions to reduce greenhouse gas emissions and adapt to the impacts of climate change and their priorities for the future.
> - transferring the responsibility for publishing guidance for local authorities on climate change to Welsh Ministers from the Secretary of State.
> - powers to make trading schemes in relation to activities which are capable of causing environmental pollution.
>
> In addition the Welsh Assembly Government, alongside the UK Government and other devolved administrations will play a key role in many other areas including appointing and sponsoring the Committee on Climate Change, setting the carbon budget and reviewing targets.

The Minister said:

> I welcome the introduction of this very important bill. Climate Change is one of the biggest challenges facing us today and my priority as Minister. This bill will play a pivotal role in helping us meet that challenge.
>
> The Bill strengthens the Assembly Government's ability to act on climate change and we have also ensured that it contains a clause requiring us to report to the National Assembly for Wales on the action we have taken and our priorities for tackling climate change.
>
> We have worked closely with the UK Government and the other devolved administrations in drafting this Bill. It will provide greater clarity and confidence for businesses and individuals to plan and invest in delivering the changes needed to move to a low carbon economy.[171]

3. Nothern Ireland

The Northern Ireland Assembly also passed a consent memorandum:

> The Assembly today granted legislative consent without dissent to the principle of the extension of the provisions of the UK Climate Change Bill to Northern Ireland. Environment Minister Arlene Foster commended the positive contribution by the Environment Committee in legislative scrutiny in progressing the consent motion purposefully. She said:
>
> "The UK government and each of the devolved administrations are committed to tackling the issue, because we need to play our part. The Climate Change Bill is intended to help the UK's transition to a low carbon economy. The Assembly's endorsement of the principle that the Bill be extended to Northern Ireland will demonstrate that we are fully committed to playing our part in tackling this very important global issue."[172]

V Variable Waste Charging

The idea that households should pay to have their waste removed has been discussed for some time by environmental managers and campaigners. It would apply the producer pays principle, a concept encouraged at a European and UK Government Level. In being charged for the amount of waste they dispose of, householders could be persuaded to create less.

More recently the Government has taken an interest in this as a viable waste management strategy that could be made available to local authorities who have to reduce the amount of waste they send to landfill. Though recycling rates have steadily increased new measures will be required to reduce landfilling further so that the UK is able to meet its obligations under the EU Landfill Directive.

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[171] Welsh Assembly Government, *Minister welcomes Climate Change Bill*, 16 November 2007
[172] Northern Ireland Executive, *Foster welcomes assembly support on climate change bill*, 10 December 2007

1. The Government's Waste Strategy

Variable charging, through which households are charged by weight of rubbish collected, was initially considered as part of the Defra's review of the waste strategy:

> **Domestic Rubbish**
>
> **Mrs. Spelman:** To ask the Secretary of State for Environment, Food and Rural Affairs what representations his Department has received calling for the introduction of variable rate charging for domestic rubbish. [104068]
>
> **Mr. Bradshaw:** Variable charging for household waste was strongly supported in a range of responses to the consultation on the Review of the Waste Strategy, particularly by environmental groups and local authorities. Respondents argued that charging would reduce waste and increase recycling rates, an important element in tackling climate change.
>
> A summary of responses to the consultation on the Review of the Waste Strategy is available on the DEFRA website at:
> http://www.defra.gov.uk/environment/climatechange/uk/legislation/pdf/summary-responses.pdf
> The Department has also received a range of letters, emails and parliamentary questions on this subject.[173]

Such a scheme is likely to involve the *chipping* of wheelie bins. A chipped bin would be recognised and associated with an address while being automatically weighed on emptying into the dustbin lorry. Materials that have been separated as recyclables for collection may not be charged for.

Before such charging is brought in by an authority a number of factors should be considered. These include the effects of charging on vulnerable groups and the increases in fly tipping that may result as people resort to less expensive disposal options.

In *Waste Strategy for England 2007*, published in May 2007, the Government set out its intention to allow local authorities to implement revenue neutral schemes. Through these households would be charged either less or more for their waste collection service, though no overall increase would be seen on council tax revenues across authorities.

> **Financial incentives for recycling**
>
> 17. Evidence from overseas suggests that incentivising householders financially to reduce the amount of non-recycled waste they throw away can be a powerful tool in reducing overall waste quantities, boosting recycling and reducing costs.
>
> 18. At present, authorities are prohibited from charging residents according to the amount they throw away (with some exceptions, e.g. for bulky waste and green waste). Sir Michael Lyons' recent report recommended giving local authorities the powers to introduce charging schemes as an incentive to reduce and recycle waste, developed in close consultation with local residents and other stakeholders. The

[173] HC Deb, 29 Nov 2006 c679W

Local Government Association and some local authorities have also called for these powers.

19. The Government wishes to make available the fullest possible range of tools that could encourage producers and consumers to change their behaviour regarding waste and recycling. The Government believes that giving authorities the power to determine locally how to respond to the waste management challenges they face is an important part of increasing local flexibility as part of the Government's devolutionary agenda.

20. The Government has considered the case for allowing authorities to introduce local variable waste charging. The Government has concluded that it does not wish to introduce a local variable waste charge, as seen elsewhere in Europe.

Instead the Government wishes to allow revenue-neutral financial incentive schemes that encourage recycling and waste prevention without increasing the amounts residents as a whole pay to their council. The Government is consulting on removing the ban on local authorities using financial incentives for waste prevention and recycling. One such tool would be a 'recycling incentive' scheme. This would be revenue neutral. High recycling, low waste households would get money back. There would be no overall increases in charges from such a scheme.

21. Authorities would be free to design their own schemes, provided they meet Government requirements set out in legislation, including the need to provide kerbside recycling facilities for at least five waste streams (excluding garden waste).

22. Subject to the outcome of the consultation, the Government proposes to legislate to remove the ban on local authorities introducing such schemes at an early legislative opportunity.

23. Financial incentives are one of a range of options available to local authorities to increase levels of recycling, reduce levels of waste disposal and therefore cut costs. Other tools currently used by authorities include reward schemes such as prize draws; alternate weekly collections; "no side waste" policies, whereby authorities only collect waste that fits within the receptacle provided; and compulsory recycling. Government does not advocate any particular tool but wishes to give authorities maximum flexibility to decide the best way to encourage sustainable waste behaviour in their local area.[174]

a. Local Government Association Comment

The Local Government Association responded favorably to these proposals which it had been lobbying for:

'The government has clearly listened to the LGA's view that any proposed household rubbish charging must not be imposed nationally on councils. It is vital that any council that considers a 'save as you throw scheme' , first guarantees that there will be no overall increase in council tax, it has public support and tough measures are in place to prevent flytipping. Only local authorities, working on the ground with local

[174] Defra, Waste Strategy for England 2007, May 2007, Cm7086:

people, have the knowledge and experience to decide how best to encourage residents to take more responsibility for their rubbish.

'The Association will now work with its member councils on the save as you throw consultation to hammer out how such a scheme could work in England.[175]

b. Committee Enquiry into Refuse Collection

In July 2007 the House of Commons Communities and Local Government Committee published its report on the inquiry into Refuse Collection. The Committee raised a number of issues that it considered important and that required consideration before any incentive scheme is introduced. In particular it was noted that:[176]

- […]revenue-neutral financial incentive schemes aimed at improving local recycling will raise no money for councils and will therefore do nothing to help them manage their waste budgets in the face of rising costs. Indeed, since 'revenue-neutral' does not mean 'cost-neutral', and since any scheme introduced by a local authority will require substantial administration and enforcement costs, they may in practice, run directly counter to the intentions Sir Michael Lyons expressed in recommended local charging schemes, by adding a further cost to the growing burden local authorities must carry.

- […]it is hard to see how a resident faced with a 'financial incentive scheme' bill for even the indicative £30 contained in the Government's consultation will see it as anything other than a charge, or a tax.

- […]it is hard to see why any council will want to set up a complicated charging scheme that earns it no money and risks widespread public disapproval.

- […]The Government recognises the risk that new financial incentive schemes to increase recycling and minimise waste may result in more fly-tipping or in people attempting to cut their bills by putting their rubbish in their neighbours' bins. We are not convinced that enough work has been done or guidance given to local authorities on how to prevent such risks from blighting areas and causing disputes. Nor are we convinced that local authorities already faced with increasing waste costs will be adequately funded to deal with increased administration, clear-up and prosecution costs.

- […]We welcome the Government's recognition that specific groups, such as large families or those on council tax benefit, should not be disadvantaged by the introduction of financial incentive schemes for increased recycling and waste reduction.

The Government response to the report has been published and is available online.[177]

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[175] LGA Press Release, *Government waste strategy leaves key questions unanswered*, 24 May 2007:
[176] Communities and Local Government Committee, Refuse Collection, 16 July 2007, HC 536-I
[177] Communities and Local Government Committee, Refuse Collection: Government Response to the Committee's Fifth Report of Session 2006-07, 25 October 2007, HC 1095.

2. The Climate Change Bill

Part 5 of the Bill will amend the *Environmental Protection Act 1990* and allow waste collection authorities designated by the Secretary of State to introduce pilot waste reduction schemes, along the lines of those envisaged in Waste Strategy 2007. Following the operation of pilot schemes, the Secretary of State must carry out a review and report to Parliament. After the review of and report on the pilot schemes, the provisions allow the Secretary of State to roll out the provisions for use by other waste collection authorities to repeal the provisions.

A number of organisations view the proposals in the Bill as a retreat from the policy originally supported in the Waste Strategy consultation. In their follow-up report, *Refuse Collection: Waste Reduction Pilots*, from February 2008, the Communities and Local Government Committee criticise this shift:

> 26. In its proposals in the Climate Change Bill, the Government has:
>
> • limited the number of recycling incentive schemes to just five local authority areas
> • capped the amounts local authorities may offer as incentives or take in charges
> • and delayed any possibility of allowing England-wide schemes before 2012-13.
>
> This represents a comprehensive retreat. The Government appears to lack the courage of its previous convictions that local authorities are best placed to decide what will work in their own areas and that recycling incentive schemes can contribute towards a genuine, measurable reduction in the volume of waste being sent to landfill.
>
> 27. The Government's retreat has resulted in a messy compromise that achieves the worst of both worlds—maximum hostile media coverage for a set of pilot schemes that will have only limited impact before EU fines fall due in 2010 and 2013. The Minister for Waste told us that "if we learn from these pilots that they are not enabling us to move forward in a different way from the progress that is being made from all the other mechanisms that are in place then we could make a decision not to go further." We recommend that the Government withdraw its financial incentive pilot proposals from the Climate Change Bill and reconsider devolving the power to introduce schemes to local authorities themselves. They, both in our view and according to the Government's own rhetoric, are best placed to judge how refuse should be collected and whether local residents should be asked to gain incentives by increasing their recycling or to pay additional charges if they do not. [178]

The Government responded:

> We do not agree with the Committee that this policy is either "half-hearted" or a "retreat". In developing the policy on waste incentive schemes since initial proposals were published last May, the Government has sought to take account of views expressed in both formal and informal consultation. The Government would rightly have been criticised had it failed to do this.

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[178] Communities and Local Government Committee, Refuse Collection: Waste Reduction Pilots the Committee's Sixth Report of Session 2007-08, 4 February 2008, HC 195:

> These are new powers for England and piloting is widely regarded as a sensible approach. It allows us to trial the schemes and gather high quality evidence before taking a decision on whether the powers should be made more generally available.
>
> The Government would not be running pilots if it did not think that the policy could have an important impact on reducing the amount of waste which goes to landfill. Evidence from overseas strongly supports this view.
>
> The Government firmly believes that local authorities, working closely with their communities, are best placed to decide what will work in their area. This is why it will be up to local authorities—both during the piloting stage, and if the powers are rolled out in the future—to decide whether they wish to run a scheme; and how the scheme should operate.[179]

VI Renewable Transport Fuel Obligation

The *Energy Act 2004* (Part 2, Chapter 5, sections 282-317) provides powers for the Secretary of State to introduce a Renewable Transport Fuel Obligation (RTFO). This places an obligation on fuel suppliers to ensure that a certain percentage of their aggregate sales are made up of biofuels. It requires 5% of all UK fuel sold from UK forecourts to come from a renewable source by 2010.

The *Energy Act* sets out details about how to define the obligation, make arrangements for appointing a body to administer it, determine amounts of fuel for the purposes of discharging the obligation, provide for the issue of certificates to suppliers and for the alternative discharge of the obligation through payment, and finally for the civil penalties associated with contravention of the obligation. The full text of these provisions in the Act is available online.[180] The relevant part of the Explanatory Notes to the Act, which may be more comprehensible, is also online.[181] It states:

> An RTFO would require designated transport fuel suppliers to produce to the appointed Administrator evidence of a specified kind and in a specified form, showing that, within the relevant period, a specified amount of "renewable transport fuel" was supplied within the UK.[182]

Part 5 of the Bill seeks to amend the existing administration arrangements for the RTFO, including the creation of a duty on the Administrator to" promote the supply of sustainable fuel which has a beneficial environmental effect". The Explanatory Notes to the Bill sets out the detail:

> The amendments will introduce a new power to replace the Administrator with a new Administrator, who may be the Secretary of State, and to transfer functions accordingly; amend the provisions which determine how sums received by the Administrator are to be dealt with; give the Secretary of State a power to issue written

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179 Communities and Local Government Committee, Refuse Collection: Waste Reduction Pilots—Government Response to the Committee's Sixth Report, 6 May 2008, HC 541:
180 Energy Act 2004
181 Explanatory Notes to the Energy Act 2004
182 Energy Act 2004, Explanatory Notes

directions to the Administrator; impose a duty on the Administrator to promote the supply of sustainable fuel which has a beneficial environmental effect; and set up an information gateway to allow disclosure of information by Her Majesty's Revenue and Customs to the Administrator.[183]

VII Climate Change Bill: House of Commons

The Bill is due to have its Second Reading in the House of Commons on 9 June 2008. Full details of the Bill as it currently stands, together with Explanatory Notes, are available on the Parliamentary website.[184] Various documents, including a final impact assessment, are available on the Defra website together with a macro analysis of long run costs of climate change mitigation targets.[185]

The contents of the Bill are summarised in the Explanatory Notes as follows:

> This Bill sets up a framework for the UK to achieve its long-term goals of reducing carbon dioxide emissions and to ensure steps are taken towards adapting to the impact of climate change. Its main elements are as follows:
>
> - **Setting emissions reduction targets in statute and carbon budgeting**. It is intended that the Bill will establish an economically credible emissions reduction pathway to 2050 and beyond, 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, beginning with the period 2008-2012, and be set three periods ahead. The Secretary of State is required to give indicative ranges for the net UK carbon account in each year of a budgetary period, and to develop and report on his proposals and policies for meeting carbon budgets.
>
> - **The creation of an independent 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 the Government and devolved administrations 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 on how much effort should be made by the part of the economy covered by trading schemes and by the rest of the economy, as well as reporting on progress.
>
> - **A new reporting framework**. The Bill provides for a system of annual reporting by the Government on the UK's greenhouse gas emissions. The Committee on Climate Change will have a specific role in reporting annually on progress, with the Government required to lay before Parliament a response to this progress report.
>
> - **Trading scheme powers**. The Bill includes new powers to enable the Government and the devolved administrations to introduce new domestic trading

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183 Climate Change Bill 2008, Explanatory Notes
184 Parliament webpage, Climate Change Bill [on 6 June 2008]
185 Defra webpage, UK Legislation: taking the Climate Change Bill forward – progress [on 6 June 2008]

schemes to reduce emissions through secondary legislation. This increases the policy options which the Government could use to meet the medium and long-term targets in the Bill.

- **Adaptation**. The Bill sets out a procedure for assessing the risks of the impact of climate change for the UK, and a requirement on the Government to develop an adaptation programme on matters for which it is responsible. The programme must contribute to sustainable development. The Bill also gives powers to direct other bodies to prepare risk analyses and programmes of action.

- **Policy measures to reduce emissions**. The Bill will be used to support emissions reductions through several specific policy measures: implementation of the Carbon Reduction Commitment - a mandatory cap-and-trade scheme covering energy use emissions from large, non-energy-intensive organisations; improving the operation of the Renewable Transport Fuel Obligation; and providing a power to pilot local authority incentives for household waste minimisation and recycling.

Appendix 1: UK Emission statistics

UK estimates of CO_2 emissions and other greenhouse gases are compiled for Defra by AEA Energy & Environment according to IPCC guidelines and standards. The emission estimates are updated every year and any changes are retrospectively applied to estimates for earlier years to provide a consistent series. These changes can be the result of new data, guidance from international organisations or new research. The UK, as with all Annex I[186] Parties to the UN Framework Convention on Climate Change (UNFCCC), submits an annual inventory to the UNFCCC. These then undergo expert scrutiny. The data underlying the inventory are also subjected to an audited quality control system that tests a number of aspects including reliability, consistency and completeness.[187]

The latest detailed estimates are for emissions in 2006. They were first provisionally estimated in March 2007, final totals were published at the end of January 2008, detailed breakdowns of emissions were produced on Defra's website at the end of March 2008 and the UK's annual emissions inventory was submitted to the UNFCCC in the middle of April 2007. Some provisional data for 2007 was published at the end of March 2008.

Carbon dioxide

a. Estimates

CO_2 emissions estimates aim to capture all emissions related to human activity - the combustion of fossil fuels and waste, various industrial processes such as cement production, fugitive emissions and the net emissions from land-use change and forestry. Activity data on fuel use, production, land-use etc. are multiplied by unit emission factors (estimated CO_2 emissions per unit of activity) to produce totals within internationally agreed source categories. The categories include energy generation, industry, transport and residential. These in turn are summed to produce the total estimate. Most UK CO_2 estimates (and all those included in this section) cover sources in the UK and the Crown Dependencies of Jersey, Guernsey and the Isle of Man. When CO_2 emissions are added to other greenhouse gases for to measure Kyoto Protocol progress the coverage extends to the Overseas Territories that have ratified the Kyoto Protocol (the Cayman Islands, the Falkland Islands, Bermuda, Monserrat and Gibraltar). In practice this has relatively little impact on emissions.

Source categories are the most straightforward breakdown as they are the basic 'building block' of the emissions estimate. Their one limitation is that some major categories such as electricity generation and fuel processing are intermediary stages rather than a final use. For instance, the breakdown of emissions by source category gives a total to the residential sector using only the direct combustion of fuels (gas, coal, oil etc.) in the home and does not include anything for use of electricity or the energy used in processing those fuels. Therefore emissions are also estimated on an end user basis that assigns emissions from power generation and fuel processing to their consuming sectors on a pro rata basis.

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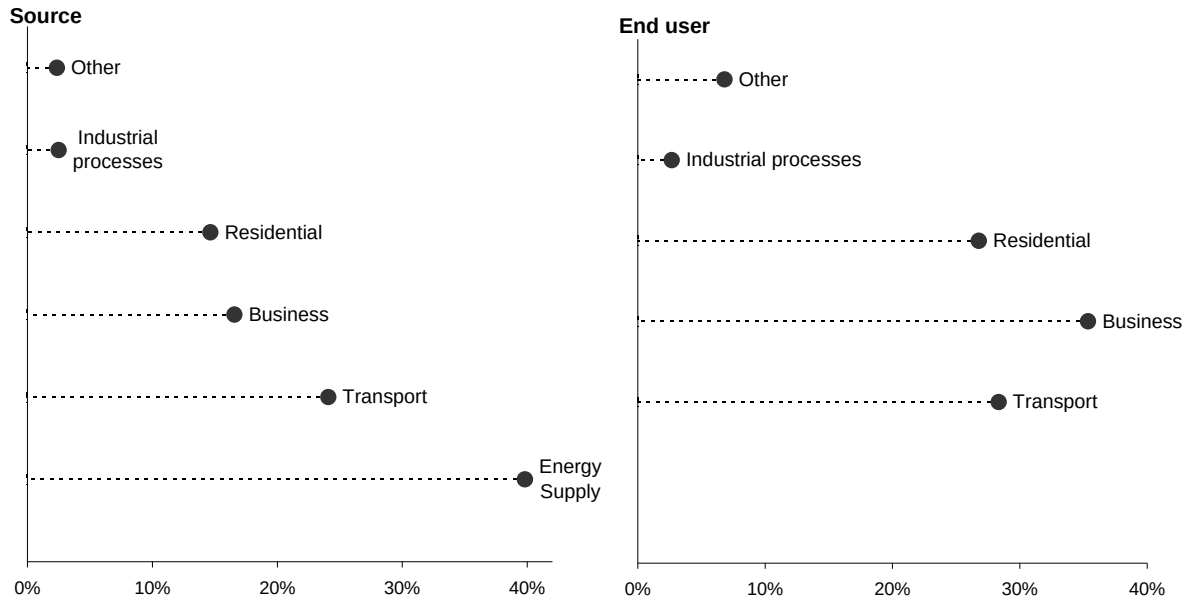
[186] Broadly speaking these are industrialised countries.
[187] HC Deb 17 July 2006 c28w

The following charts show CO_2 emissions broken down by end user and fuel category. They use 'National Communication' categories which Defra has started to publish in recent years. 2006 end user data is currently only available for these categories. Other source breakdowns in this note use internationally agreed IPCC categories.

Estimated UK CO_2 emissions by source and end user, 2006



Source: e-Digest of Environmental Statistics, climate change table 5a, Defra

Energy supply clearly dominated the emission sources with almost 40% of the total; road transport was next largest with almost 25%, followed by business and residential with 17% and 15% respectively. The end-user analysis showed a different distribution with the business and residential sectors increasing their share due to their electricity use. Overall business was ultimately responsible for 35%, transport 28% and the residential sector 27%. End user emissions from the residential sector of 149 $MtCO_2$ were an average of 2.5 tonnes of CO_2 per person and 6.0 tonnes per household.[188]

b. Uncertainty and quality control of emission estimates

The emissions data are estimates and despite continued development of the methodology and data sources they are still subject to a degree of uncertainty. This has been estimated at ±2.1% for CO_2 in 2005. This means that the total is thought to be accurate within 2.1%. Trends are also affected, but to a lesser degree as some of the uncertainties are assumed to be correlated over time. The estimated change in CO_2 between 1990 and 2005 is -6.3%, the 95% confidence interval (the range within which we can be reasonably confident that the 'true' value lies) is -3.7% to -8.9%.[189]

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[188] Mid -2006 population estimates and 2006 estimate of household numbers. www.statistics.gov.uk

[189] *UK Greenhouse Gas Inventory, 1990 to 2005: Annual Report for submission under the Framework Convention on Climate Change*, NETCEN. Annex 7

c. Trends

The next chart and Table 1 at the end of this Appendix detail CO_2 emissions since 1970. Putting aside the year-on-year variability they show a steady decline between 1979 and the mid 1990s. This reduction was mainly associated with the displacement of coal in electricity generation by gas and nuclear power and the decline in emissions from industry. There have been annual variations in emissions since the mid-1990s, but no clear trend up or down.

It is important not to place too much importance on year-on-year variations as annual changes in temperatures; short-term economic trends etc. can temporarily shift emissions away from their long term trend.

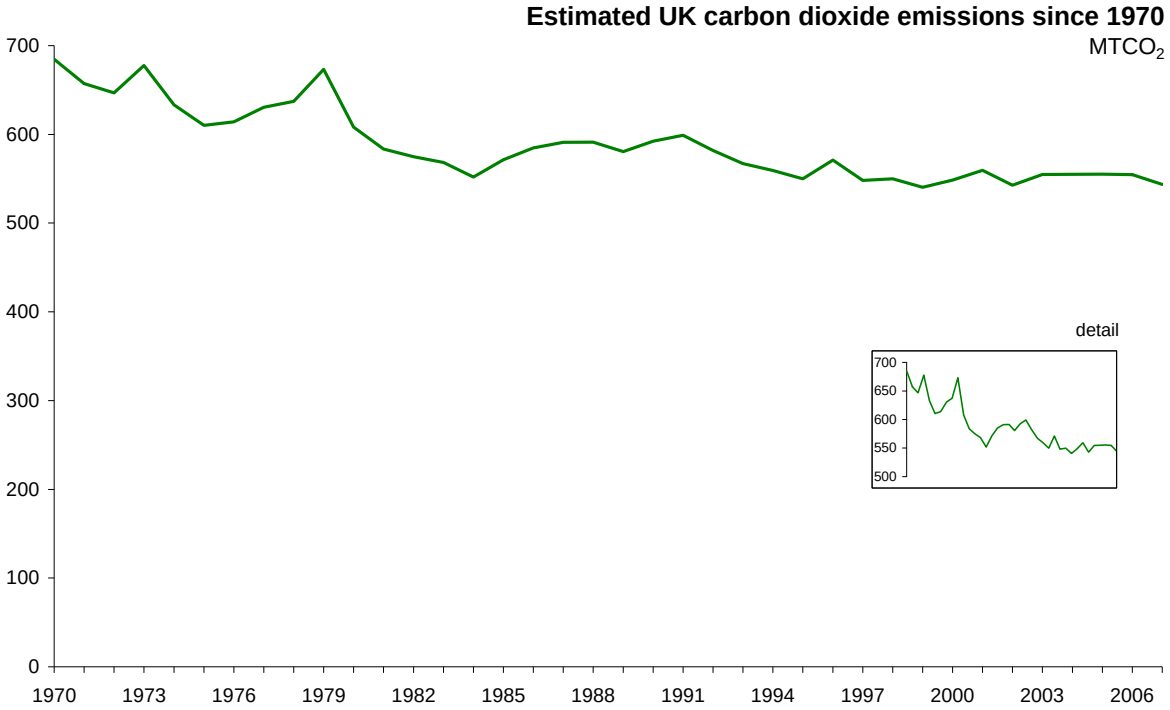
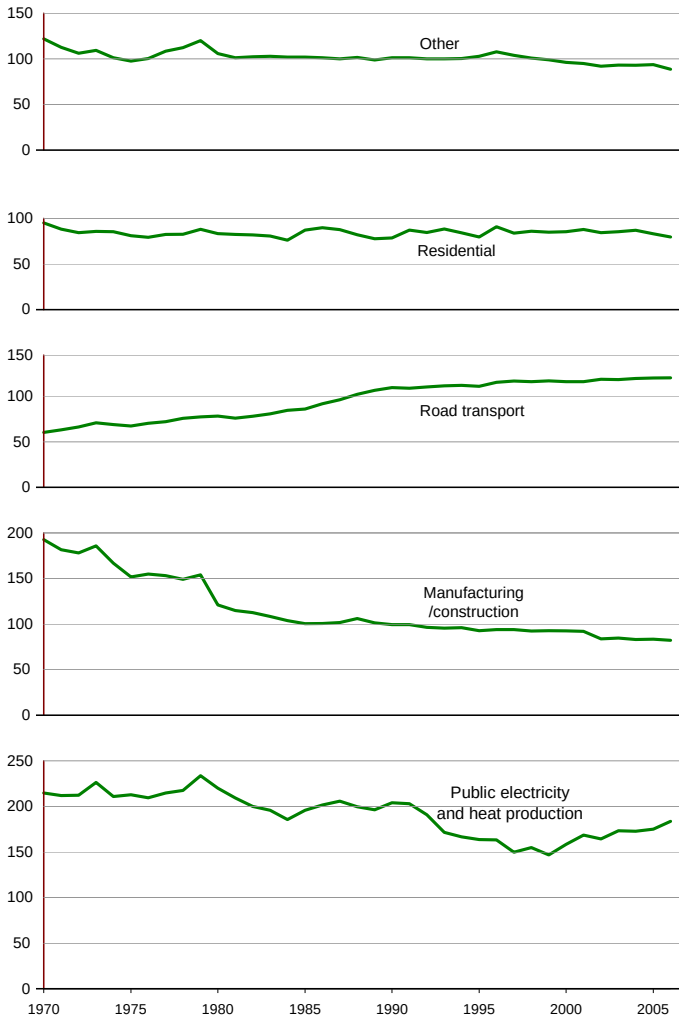


Table 1 and the charts opposite give emissions by source (rather than end user). Over the last 35 years the major changes have been the increased emissions from road transport and the reduction from industry and construction. The proportion of total emissions from road transport increased from 9% in 1970 to 22% in 2006, industry and construction emissions fell from 28% to 15%. Emissions from heat and power generation fell by one-third between the early 1970s and late 1990s, but have since started to increase again.

Trends in estimated CO_2 emissions by source

$MTCO_2$



The increase in carbon emissions from heat and power from 2003 onwards was in large part due to the increase in coal fired power. Higher gas prices have made coal more economic. Emissions from coal used in power generation increased by just over 10 $MTCO_2$ between 2002 and 2005;[190] the increase in total UK emissions over the same period was 13 $MTCO_2$.

The residential sector has been the only major sector where emissions have fallen in the past two years. Provisional data suggest this trend was reversed to some degree in 2007.[191]

Under internationally agreed guidelines, emissions from international aviation are not included in any one country's totals. They are noted for information purposes however, and 2006 emissions from international flights refuelling at UK airports were estimated at 35.6 $MTCO_2$.[192]

d. EU Emissions Trading Scheme (ETS) adjustments to total emissions

The earlier data is all based on estimates that look at emissions which are, broadly speaking, associated with activities that occur in the UK. This is the basis for official data on the subject. However, under the rules of the EU ETS adjustments can be made to reflect UK companies' buying and selling of emission allowances. Data is available for 2005, 2006 and 2007 when actual emissions from UK installations were 27.1 $MTCO_2$, 33.8 $MTCO_2$ and 27.6 $MTCO_2$ *above* their allowances respectively. These installations would have had to buy

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190 *UK Greenhouse Gas Inventory, 1990 to 2005: Annual Report for submission under the Framework Convention on Climate Change*, NETCEN. Common Reporting Format Tables

191 *Carbon dioxide emissions and energy consumption in the UK*, Energy Trends special feature March 2008, BERR

192 *e-Digest of Environmental Statistics*, climate change table 4a, Defra

allocations to cover these additional emissions and the adjustment methodology takes this total off the purchasing country's emissions. These emissions are traded. Hence 2006 emissions of 554.5 $MTCO_2$ falls to 520.7 $MTCO_2$ and the change since the 1990 baseline goes from -6.4% to -12.1%. These adjustments can be taken into account when determining whether the Kyoto and domestic targets have been met.[193] [194] [195]

The Environmental Audit Committee has expressed concern about the use of this adjustment: [196]

> **A natural concern which arises from this relates to the transparency of Government reporting of progress against its 2010 target**. The Government is, of course, perfectly free to treat such international greenhouse gas reductions as counting towards its 2010 target: it is, after all, a domestic target which the Government has set itself, along with the rules applying to it. (In addition, when it comes to Kyoto targets, exactly this same use of international emissions reductions is allowed for under the Kyoto Protocol.) However, **by automatically ascribing all the savings projected to be generated by the UK's Phase II NAP as though they were being made within the UK, it is quite possible the Government might help to give a falsely reassuring picture of progress against its domestic CO2 target within the UK.**

The Committee were also concerned about whether buying emission credits from other countries necessarily translated into cutting emissions at all. They called for the Government to differentiate between the two types of estimates, but they did accept that the adjusted totals are not given great prominence at the moment.[197] In a follow up report they criticised a chart of emissions produced in the 2007 Budget report that made this adjustment without putting it alongside the unadjusted 2005 data.[198]

e. Projections to 2020

The most recent greenhouse gas emission projections were published by the (then) DTI alongside the Energy White Paper in May 2007.[199] These covered the period up to 2020 and measured possible progress against both the Kyoto and domestic CO_2 targets, although detailed results were only given for CO_2. The projections used three different scenarios with different levels of fossil fuel prices (high, central and low). Unlike earlier projections they included an estimate of the impact of measures in the publication they were produced alongside (hence the policies up to and including those included in the Energy White Paper). There is much uncertainty about savings from these policies and their timing, so three alternatives are given – low, central and high carbon savings. They also included an illustrative projection of the impact of the EU ETS in future years. These are projected to

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193 HC Deb 8 March 2007 c2183w

194 *UK Climate change sustainable development indicator: 2006 greenhouse gas emissions, final figures,* Defra. Annex C

195 *Sector level summary of 2007 EU ETS results in the UK*, Defra

196 *The EU Emissions Trading Scheme: Lessons for the Future*, House of Commons Environmental Audit Committee second report 2006-07. para 70

197 ibid. Paras 69 and 71-85

198 *Emissions Trading: Government Response to the Committee's Second Report of Session 2006-07 on the EU ETS*, House of Commons Environmental Audit Committee eighth report 2006-07.

199 *Updated energy and carbon emissions projections –The Energy White Paper. May 2007*, DTI.

result in net savings of 32 $MTCO_2$ in 2010 falling to 21 $MTCO_2$ in 2020 as emissions from UK firms get closer to their allocation. The central results are summarised below:

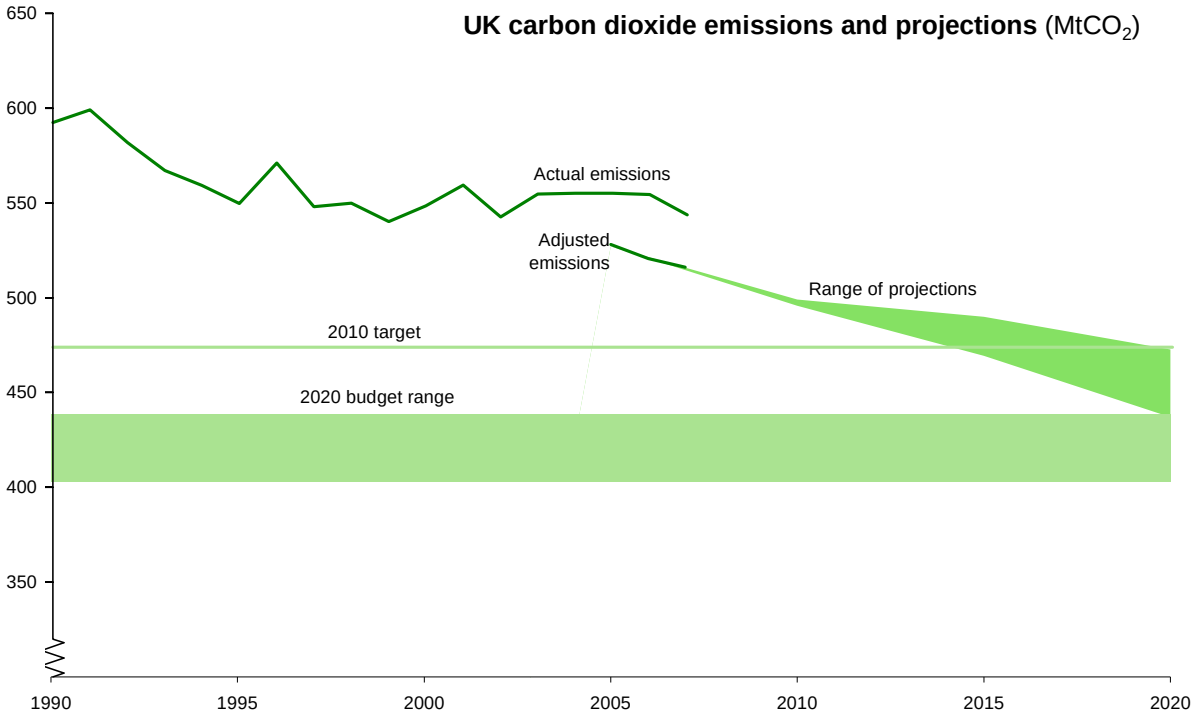
Summary of CO_2 projections -central fuel prices and central savings from White Paper proposals

	UK total		Including EU ETS allowances purchased from abroad	
	$MTCO_2$	Change from baseline	$MTCO_2$	Change from baseline
1990	592.1	-	592.1	-
2005	554.2	-6.4%	527.2	-11.0%
2010	529.5	-10.6%	497.6	-16.0%
2020	484.7	-18.1%	463.8	-21.7%

Source: Updated energy and carbon emissions projections –The Energy White Paper. May 2007, DTI

This shows that even with the inclusion of EU ETS allowances purchased from abroad the UK is projected to fall short of its 2010 domestic target of a 20% cut. The 2020 figure, on these central estimates, of a 22% cut is outside the proposed carbon budget covering 2020 which would require cuts of 26-32%.

The range of projections from high to low savings from policy proposals are illustrated below alongside the domestic 2010 target and the proposed carbon budget covering 2020. The projections include the full impact of the EU ETS and hence meet up with the three years of adjusted emissions, rather than the longer term actual emissions series.



This showed that with (then) current policies only the high estimate of policy savings gives a 2020 emissions figure that is just within the proposed carbon budget. Under the most optimistic projections the 2010 domestic target is not met until 2015, under the least optimistic it is not met until 2020. The gap between the low and high policy savings scenarios in 2020 is just over 35 $MTCO_2$.

The high and low fossil fuel price scenarios are only published alongside central policy savings. By 2020 the low price scenario gives a cut of 19.1%, the high price scenario a cut of 23.3%. In general with low fossil fuel prices usage increases from the demanding sectors, especially transport and residential, but this is partially offset with lower emissions from energy supply.[200] The reverse is true in the high price scenario. The model assumes new nuclear generation in the high fossil fuel price scenario only and this is a relatively small (1 GW in 2020).

Among the major source sectors the largest proportionate cut under the central scenario is from residential with 35%. The largest absolute reduction is from power stations (10.4 $MTCO_2$ or 23%). There are projected to be only small falls in emissions from industry and transport.

The Climate Change Bill includes additional measures to reduce emissions including the Carbon Reduction Commitment, the Renewable Transport Fuels Obligation and incentives to reduce waste. The Government has estimated that together they could save the equivalent of 9.4-13.9 $MTCO_2$ per year by 2020.[201] If these are included in the projected savings they give a range of reductions in 2020 of 22%-29%.

These projections are less a best guess at what the level of emissions might be and more a best guess at what they might be in the absence of any additional policies. Their primary function is to inform not forecast future policy. A National Audit Office (NAO) review of carbon projections since 2000 showed over time the various projections for 2010 have generally increased. Those made in 2000 were for a 19% reduction, this had been revised to 14.4% in 2004 and 10.6% for the projections made in 2006. This was despite the 2006 projections including additional carbon saving policies. The NAO stated that the 2006 (and by analogy the latest) projections were less optimistic and 'more sceptical' about policy savings than those produced in 2000.[202]

f. Projections to 2050

The latest emissions projections only cover the period to 2020. Those published alongside the 2006 Energy Review also looked over the period to 2050. To do this they employed a 'scenario approach' that differed from the (then) main projections from 2010 onwards. This method used a greater element of forecasting rather than pure projection and included a wider range of assumptions. The central projections follow the main projections to 2020, then showed a gradual increase to above 1990 levels by 2050. The high growth scenario showed emissions increasing sharply from 2020 to be around 25% above baseline levels by 2050. The low growth scenario had emissions falling very slightly from 2025 to reach around 20% below the baseline by 2050.[203] These projections do not include the impact of measures outlined in the Energy Review or any subsequent policy. Their assumptions about

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[200] The assumption on price differentials makes gas relatively cheaper than coal in this scenario and hence emissions per unit of electricity generated are lower, as are total emissions from this sector.

[201] *Taking forward the UK Climate Change BILL: The Government Response to Pre-Legislative Scrutiny and Public Consultation, October 2007*, Defra (Cm 7225)

[202] *Emissions projections in the 2006 Climate Change Programme Review*, NAO (2006)

[203] *UK Energy and CO_2 emissions projections July 2006*, DTI. Part 2.

emissions to 2020 have been superseded by the latest projections. But they are the most recent that cover the period to 2050.

All greenhouse gases

g. Estimates

Emissions of the other gases covered by the Kyoto Protocol – methane, nitrous oxide and the so-called F-gases (hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) are all calculated in fundamentally the same way as CO_2 emissions. They are frequently expressed in their CO_2 equivalent values[204] to compare their relative importance and add them to look at combined trends.

Estimates of emissions are published back to 1990 on an IPCC basis. The uncertainty for the non-CO_2 gases is greater, especially for nitrous oxide. The ranges based on the 2005 inventory of emission were ±21% for methane, -72% to +270% for nitrous oxide and ±6% to ±25% for the different F-gases. When all the Kyoto basket of gases are combined the range of uncertainty for the total CO_2 equivalent is estimated at ±14.3%. The 95% confidence interval for the trend in total emissions from 1990 to 2005 is 0% to -28.7%.[205]

The table below gives a breakdown of 2005 emissions by gas, source and end user using National Communication categories.

Breakdown of estimated UK emissions of the Kyoto basket of greenhouse gas emissions in 2005

Percentage of total carbon equivalent

Gas		*Source*		*End user*	
Net CO_2 emissions	84.7%	Energy Supply	34.5%	Business	31.3%
Methane	7.5%	Transport	21.0%	Transport	25.5%
Nitrous Oxide	6.1%	Business	16.0%	Residential	23.8%
Hydrofluorocarbons	1.4%	Residential	13.5%	Agriculture	8.0%
Perfluorocarbons	0.1%	Agriculture	7.6%	Public	3.4%
Sulphur hexafluoride	0.2%	Waste management	3.4%	Waste management	3.4%
		Industrial Process	2.6%	Industrial processes	2.8%
		Other	1.4%	Other	1.8%

Source: UK Climate Change Programme Annual Report to Parliament, July 2007, Defra

CO_2 is clearly the dominant greenhouse gas in the UK. Given this, the source and end-user breakdowns are not very different from those for CO_2 on its own. The main difference is the increased importance of agriculture, waste management and industrial processes. However, when combined these users only accounted for 14% of emissions in 2005.

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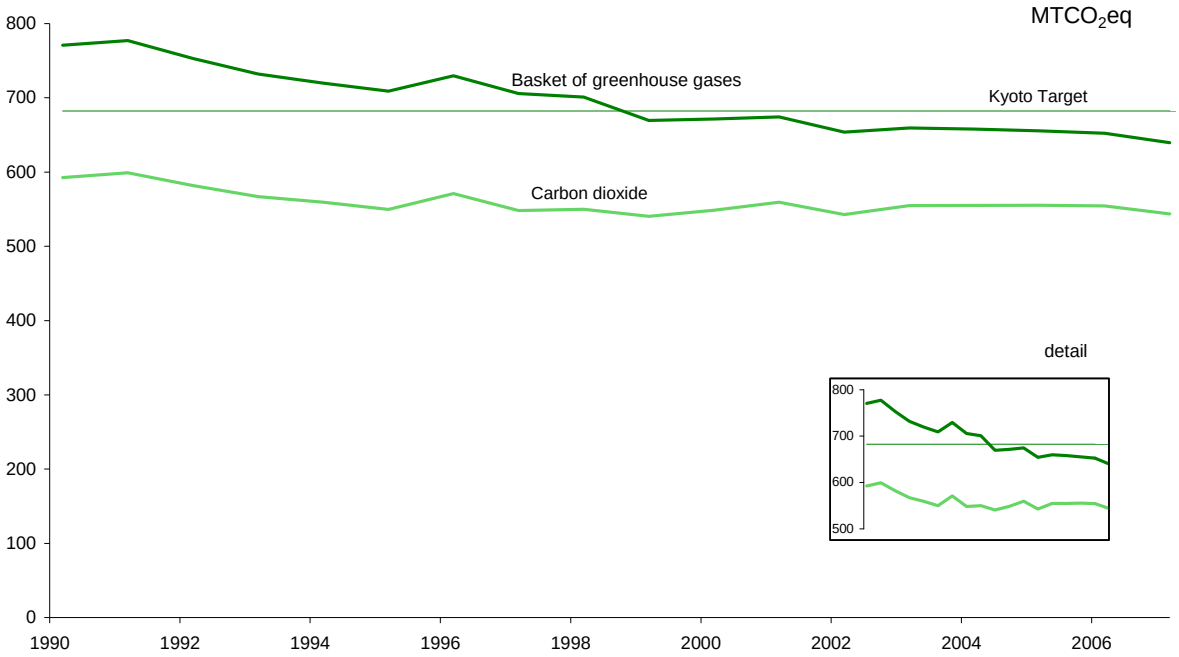
[204] Calculated by multiplying emissions by their Global Warming Potential relative to CO_2

[205] *UK Greenhouse Gas Inventory, 1990 to 2005: Annual Report for submission under the Framework Convention on Climate Change*, NETCEN. Annex 7

h. Trends

The UK's commitment under the Kyoto protocol is to reduce the basket of greenhouse gas emissions by 12.5% relative to the 1990 level over the period 2008-2012.[206] Trends since 1990 are illustrated below.

Emissions of greenhouse gases: UK 1990-2007



Source: *e-digest of environmental statistic*s, climate change table 4, Defra

Emissions fell steadily during the 1990s, but latterly the rate of decline has slowed and the trend has been flat for the last four years. When compared to CO_2 emissions alone the fall since 1990 was faster and lasted for a longer period. Emissions fell below the Kyoto target level in 1999 and have remained below it ever since. Estimated emissions of the Kyoto basket of gases in 2007 were 18.0% below the baseline.[207] This reduction is likely to increase when 2007 purchases of EU ETS emission allowances from abroad are included.

Table 2 at the end of this section gives a breakdown by gas since 1990. CO_2 is increasingly the most significant contributory gas, accounting for 76.4% of the total in 1990 and 85.0% in 2007. The largest absolute fall (CO_2 equivalent) was in methane which fell by 54 $MTCO_2$-eq between 1990 and 2006. The fall in CO_2 emissions was 49 $MTCO_2$-eq up to 2007. There have been large falls in methane emissions from landfill and fugitive emissions from coal mines.[208]

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[206] The actual base year for the F-gases is 1995, this is combined with emissions of the other gases in 1990 to give the Kyoto baseline total. This is referred to in this paper as the 1990 baseline. As mentioned earlier the geographical coverage includes the Crown Dependencies and Overseas Territories.

[207] *UK Climate change sustainable development indicator: 2007 greenhouse gas emissions, provisional figures,* Defra

[208] *e-Digest of Environmental Statistics, climate change table 4b*, Defra

When all the Kyoto basket of gases are combined the largest falls between the base year and 2005 in absolute terms were from energy supply (47 $MTCO_2$-eq), waste management (31 $MTCO_2$-eq) and industrial processes (28 $MTCO_2$-eq). Transport had the largest increase (13 $MTCO_2$-eq).[209]

i. Projections and targets

The projections that were published alongside the Energy White Paper included projections of total greenhouse gases, although in much less detail than for CO_2 on its own. All price and policy savings scenarios show emissions at well within the Kyoto target levels in 2010, although the precise levels are not given. The 2007 annual report to Parliament on the Climate Change Programme stated that the reduction by 2010 'might be about 23% below Kyoto base-year levels'.[210] Further reductions are expected to 2020 where the range[211] is 25-30% below the 1990 baseline.[212]

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[209] *UK Climate Change Programme Annual Report to Parliament, July 2007*, Defra. Table 6
[210] ibid. Para. 28
[211] From low to high policy savings with central fossil fuel prices
[212] *Updated energy and carbon emissions projections –The Energy White Paper. May 2007*, DTI.

Table 1

Estimated emissions of carbon dioxide by IPCC source category: UK 1970 - 2006

$MtCO_2$

	1970	1980	1990	2000	2001	2002	2003	2004	2005	2006	*% change 1970 to 2006*	*% change 1990 to 2006*
Public electricity and heat production	214.8	220.0	204.0	158.3	168.6	164.3	173.4	172.7	175.0	183.7	*-14%*	*-10%*
Petroleum refining	21.1	20.7	18.3	17.3	16.9	18.7	18.0	17.7	18.7	15.7	*-26%*	*-14%*
Manufacture of solid fuels and other energy industries	22.3	8.5	13.5	18.3	18.5	19.1	18.9	18.8	17.9	16.3	*-27%*	*+20%*
Manufacturing industries and construction	192.6	121.0	99.4	92.4	92.1	83.7	84.7	83.1	83.6	82.3	*-57%*	*-17%*
Road transport	60.3	78.2	109.4	116.0	116.0	118.4	118.2	119.4	119.9	120.3	*+100%*	*+10%*
Civil aviation	0.7	0.9	1.2	1.9	2.0	2.0	2.1	2.2	2.4	2.3	*+232%*	*+93%*
Railways	1.8	1.8	1.7	1.8	1.9	1.9	2.0	2.1	2.1	2.2	*+18%*	*+29%*
Other - transport	3.7	4.0	4.4	3.5	3.0	2.6	4.1	4.1	4.6	6.0	*+59%*	*+36%*
Commercial and institutional	41.1	31.8	25.5	25.8	26.5	22.3	22.6	23.2	22.6	21.7	*-47%*	*-15%*
Residential	95.2	83.3	78.5	85.6	87.8	84.5	85.4	86.9	83.1	79.7	*-16%*	*+2%*
Agriculture, forestry and fishing fuel use	6.2	5.2	5.1	4.7	4.8	4.8	4.7	4.6	4.5	4.3	*-31%*	*-17%*
Military aircraft and shipping	4.5	4.5	5.3	2.9	2.9	3.1	2.8	2.9	2.8	2.7	*-39%*	*-48%*
Fugitive emissions from fuels	1.9	12.8	6.6	5.7	5.6	5.6	5.4	5.3	5.9	4.9	*+155%*	*-25%*
Industrial processes	17.0	14.2	15.3	14.2	13.0	12.4	13.2	13.6	13.8	14.0	*-18%*	*-9%*
Waste treatment and disposal	0.1	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	*+565%*	*+26%*
Energy recovery & breakdown of hydrocarbon products	1.4	1.4	1.2	0.5	0.5	0.5	0.5	0.5	0.4	0.4	*-70%*	*-65%*
Land-use change and forestry	0.0	0.0	2.9	-0.4	-0.6	-1.1	-1.2	-1.9	-2.1	-2.0	-	*-170%*
Total	**684.8**	**608.3**	**592.4**	**548.6**	**559.4**	**542.7**	**554.7**	**555.1**	**555.2**	**554.5**	***-19%***	***-6%***

Note: This table includes emissions from Jersey, Guernsey and the Isle of Man from 1990, but excludes emissions from overseas territories.

Source: *e-Digest of Environmental Statistics, climate change table 4a,* Defra

Table 2

Estimated total emissions of UK 'basket' greenhouse gases on an IPCC basis

$MtCO_2$

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007 (provisional)	*Kyoto target [(a)] for 2008-2012*
Carbon dioxide (net)	592.4	599.1	582.0	567.1	559.3	549.8	571.0	548.1	549.9	540.3	548.6	559.4	542.7	554.7	555.1	555.2	554.5	543.7	
Methane	103.5	102.7	101.2	98.1	91.1	90.2	87.8	82.9	78.2	73.0	68.4	62.4	59.4	53.4	51.6	49.6	49.1	-	
Nitrous oxide	63.8	63.8	57.5	53.0	54.3	53.0	53.4	54.8	54.5	44.2	43.6	41.5	40.1	39.8	40.6	39.8	38.3	-	
HFCs	11.4	11.9	12.3	13.0	14.0	15.5	16.7	19.2	17.3	10.9	9.1	9.7	9.9	10.2	8.9	9.2	9.2	-	
PFCs	1.4	1.2	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	-	
Sulphur hexafluoride	1.0	1.1	1.1	1.2	1.2	1.2	1.3	1.2	1.3	1.4	1.8	1.4	1.5	1.3	1.1	1.1	0.9	-	
Kyoto basked total[(b)]	**770.8**	**777.3**	**752.9**	**732.1**	**719.7**	**709.0**	**729.5**	**705.6**	**700.9**	**669.5**	**671.4**	**674.4**	**653.8**	**659.5**	**657.9**	**655.5**	**652.3**	**639.4**	***682.4***

Note: This table includes emissions from Jersey, Guernsey and the Isle of Man, but excludes emissions from overseas territories.

(a) The 1990 baseline, used for comparison with the Kyoto target, is the sum of 1990 totals for carbon dioxide (net), methane and nitrous oxide and 1995 totals for HFCs, PFCs and sulphur hexafluoride.

(b) The Kyoto basket totals differ slightly from the sum of the 6 individually reported gases shown above due to differences in the coverage of land use change and forestry, and the inclusion of the UK Overseas Territories of Bermuda, Cayman Islands, Falkland Islands and Montserrat in the basket total but not elsewhere.

Sources: UK Climate change sustainable development indicator: 2006 greenhouse gas emissions, final figures, Defra
2007 greenhouse gas emissions, provisional figures, Defra

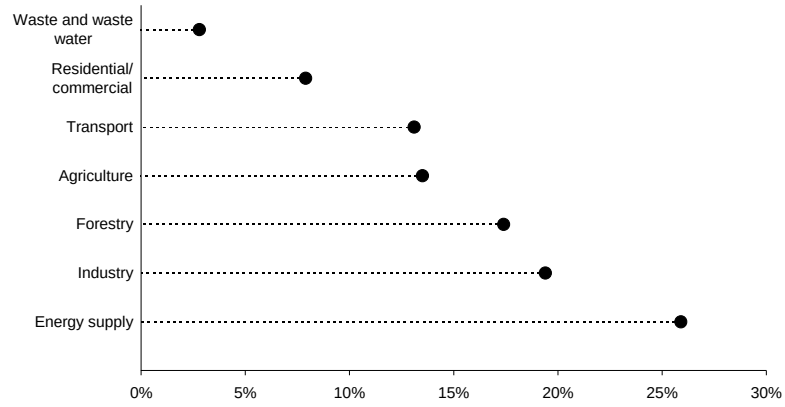
Appendix 2: International greenhouse gas emissions

International estimates of greenhouse gas emissions are compiled in broadly the same way as the UK estimates. Other industrialised countries follow the same (IPCC) guidelines, but data for non-industrialised countries is less certain as are global emission estimates. As with the UK data there is also less certainty for sources other than the combustion of fossil fuels, particularly emissions from deforestation, total methane and nitrous oxides emissions.

Global emissions of the Kyoto basket of greenhouse gases were estimated to have increased by around 70% (CO_2 equivalent) between 1970 and 2004; from 28,700 to 49,000 $MTCO_2$. The increase was 24% between 1990 and 2004; a very slightly slower annual average increase. CO_2 emissions grew by around 80% between 1970 and 2004 compared to increases of 40% for methane and 50% for Nitrous Oxide.

A breakdown of source sectors is given opposite. Together, energy supply, industry and forestry contributed 63% of all emissions. The largest increases between 1970 and 2004 were from energy supply (+145%), transport (+120%) and industry (+65%). The residential/commercial sector saw the smallest increase (26%).

Greenhouse gas emissions by sector, 2004



Source: IPCC Fourth Assessment Report -Working Group III Report "Mitigation of Climate Change", IPCC. Figure 1.3b

As with the UK figures there is uncertainty in these estimates. The range of uncertainty for methane and nitrous oxide emissions is thought to be of the order of 30-50% and even greater for CO_2 from agriculture and forestry.[213]

Data for regions and countries

The most detailed and comprehensive source of information on greenhouse gas emissions in different countries are the national inventories submitted by signatories to the UN Framework Convention on Climate Change (UNFCCC). These are summarised and aggregated by the UNFCCC secretariat. The limitations of these figures are that they only go back to 1990 and that the most detailed information is for industrialised countries and 'Economies in Transition' (former Eastern Bloc countries) –together these countries form the Annex I parties to the UNFCCC. Data has been compiled for other countries who are Parties to the Convention, but this is not year-by-year and, crucially, the latest inventories for most of these countries, including China and India, are for the mid-1990s.[214]

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[213] *IPCC Fourth Assessment Report -Working Group III Report "Mitigation of Climate Change"* –technical summary, IPCC

[214] http://ghg.unfccc.int/index.html

Estimates produced by the International Energy Agency (IEA) on CO_2 emissions from fuel combustion give regularly updated global totals and estimates for most countries of the world. These go back to 1971 and are broken down by fuel, sector and source category. Most international comparisons of CO_2 use this, or very similar, data. Emissions from fuel combustion are the main source of carbon dioxide from human activities. Data quoted by the IPCC estimates that 74% of CO_2 emissions from human activities in 2004 were due to fuel combustion and that these emissions were 57% of all greenhouse gas emissions in the same year.[215]

j. Regions

Emissions from fossil fuel combustion by region are summarised in the table below. Asia contributed just over one-third of total emissions in 2005, both North America and Europe contributed around one-quarter each. Emissions from all other regions were below 5% of the world total.

Carbon dioxide emissions from fuel combustion in 2005, by region

	$MTCO_2$	% of world total
World	**27,136**	-
By Region		
Asia	9,355	34%
North America	6,755	25%
Europe[(a)]	6,645	24%
Of which EU 27	*3,976*	*15%*
Middle East	1,238	5%
South/Central America	938	3%
Africa	835	3%
Oceania	412	2%
International aviation and marine bunkers[(b)]	959	4%

(a) Includes all countries of the former USSR

(b) Emissions from international aviation and shipping are not asigned to any geographical region, but are included in the transport figures.

Source: CO2 Emissions from Fuel Combustion 1971-2005, 2007 edition, IEA

Between 1971 and 2005 emissions from the Middle East increased almost ten-fold; faster than any other region. Emissions from Asia increased almost five-fold those from North America and Europe increased by 43% and 12% respectively. Europe was the only region where emissions fell between 1990 and 2004. This was due to the large fall from the former Eastern Bloc countries. Emissions from the rest of Europe increased slightly if these states are excluded.[216]

[215] *IPCC Fourth Assessment Report -Working Group III Report "Mitigation of Climate Change"*, IPCC. Chapter 1

[216] ibid.

Emissions from 'Annex I' Parties made up 52% of the global emissions from these sources in 2005. Emissions from these states have increased by 2% since 1990, compared to the 86% seen across non-Annex I countries. [217]

k. Individual countries

Total emissions from the twelve largest source countries are listed opposite. The US and China clearly dominated emissions (on this definition) in 2005 with 40% of global emissions. When combined the countries listed in the table produced just over two-thirds of global emissions.

CO_2 emissions from fossil fuels 2005

	Total		tonnes per capita	kg/2000 $US PPP
	million tonnes	% of world		
US	5,817	21.4%	19.6	0.53
China	5,101	18.8%	3.9	0.63
Russia	1,544	5.7%	10.8	1.12
Japan	1,214	4.5%	9.5	0.35
India	1,147	4.2%	1.1	0.34
Germany	813	3.0%	9.9	0.38
Canada	549	2.0%	17.0	0.55
UK	530	2.0%	8.8	0.31
Italy	454	1.7%	7.8	0.30
Korea	449	1.7%	9.3	0.47
Iran	407	1.5%	6.0	0.84
Mexico	389	1.4%	3.7	0.40
World	**27,136**	-	**4.2**	**0.50**

Source: CO2 Emissions from Fuel Combustion 1971-2005, IEA

This ranked list is similar to one based on GDP, although there are some differences which are partially reflected in the next two columns. Among these countries, emissions per capita were highest in the US and Canada with levels more than four times the global average. Most of the other industrialised countries here had levels 2-2.5 times the world figure. China, Mexico and India's per capita figures stood out as they were all below average –their total emissions are relatively large, but given their large populations, per capita emissions were relatively small.

Emissions per unit of GDP present a different pattern among these countries. Russia had clearly the highest level –its high rate in the 1970s and 1980s was further increased following the economic collapse in the 1990s and has still not fallen below earlier levels. Iran, China, the US and Canada all had above average rates. China's above average figure might be expected as the 'typical' profile over time is an increase in carbon intensity of an economy as it industrialises, followed by long-term gradual decline as increases in GDP outstrip carbon emissions.[218]

The charts overleaf look at emissions over time for the countries listed in the earlier table. These are plotted on even scales to help illustrate the difference in the magnitude of emissions. They show that the largest percentage increases in emissions since 1971 were from Iran, Korea, India and China. The largest absolute increases have been in the US and China. The sharp rise in emissions seen in recent years in China is very clear, as is the fact that it is catching up with the US. Germany and the UK saw falls in their emissions from 1990 to 2005, but they were very small when set beside increases elsewhere. The former USSR had the largest fall –mainly due to the collapse in its constituent economies in general and heavy industries in particular.

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[217] *CO_2 Emissions from Fuel Combustion 1971-2005, 2007 edition*, IEA

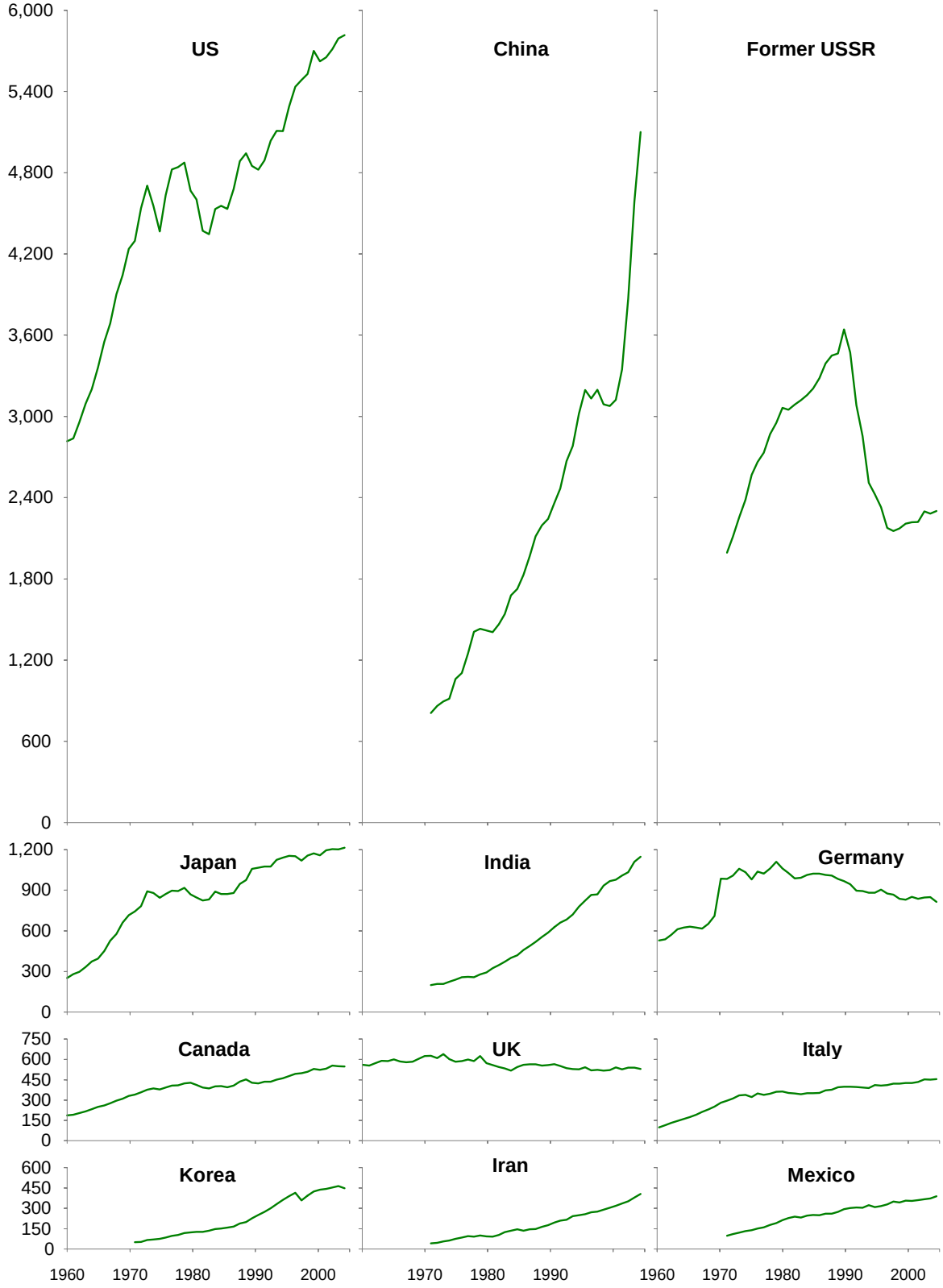
[218] Further analysis of these rates is given in the article *Greenhouse gases –international measures and comparisons* in the October 2007 edition of *Social Indicators* (Research Paper 07/70)

I. Kyoto Protocol targets

The overall combined target for parties to the Kyoto Protocol is a 5% reduction against the 1990 baseline by 2008-2012. Individual targets vary from +10% for Iceland to -8% for the EU15 and some other European states. Under the system of burden sharing the EU15 members have individual targets that, if met, would meet the overall EU15 target of an 8% cut. These individual targets vary from -28% for Luxembourg to +27% for Portugal.[219]

[219] *Kyoto Protocol targets*, UNFCCC unfccc.int/kyoto_protocol/background/items/3145.php

Trends in CO_2 emissions, selected countries, 1960-2005 ($MTCO_2$)



Source: CO_2 Emissions from Fuel Combustion, 2007 edition, IEA

Between the baseline and 2005 the aggregate emissions of Parties to the Protocol[220] fell by 13.3%. This overall decline masked much variation; there were cuts of 30-50% in many former Eastern Bloc states and increases of over 40% in Spain and Portugal. EU15 emissions in 2005 were 1.5% below its collective baseline. Much of the overall decline has been in the so-called 'Economies in Transition'. Their emissions generally stopped falling towards the end of the 1990s and the total emissions of all Kyoto Parties increased by 3.2% between 2000 and 2005.[221] [222]

Projections

THE IPCC has summarised the various different projections of global greenhouse gas emissions. The projections to 2030 (compared to 2000) are for increases ranging from 25-90%. These assume no additional policies to reduce emissions. Within this CO_2 emissions from fossil fuels are expected to grow at a faster rate than other greenhouse gases. Much of this growth comes from industrialising developing countries; two-thirds to three quarters of the total increase is expected to come from these countries. However, their per capita emissions are projected to remain well below those in developed countries. More recent projections tend to give higher increases.[223]

In 2000 the IPCC *Special Report on Emissions Scenarios* gave a 2100 range of -40% to +250% (again compared to 2000). This range is said to be still valid. More recent projections give a range of +90% to +250%. Even those scenarios that look at policies currently under discussion show global emissions increasing for 'many decades' and atmospheric concentrations of greenhouse gases unlikely to stabilise this century without 'major' policy changes.[224]

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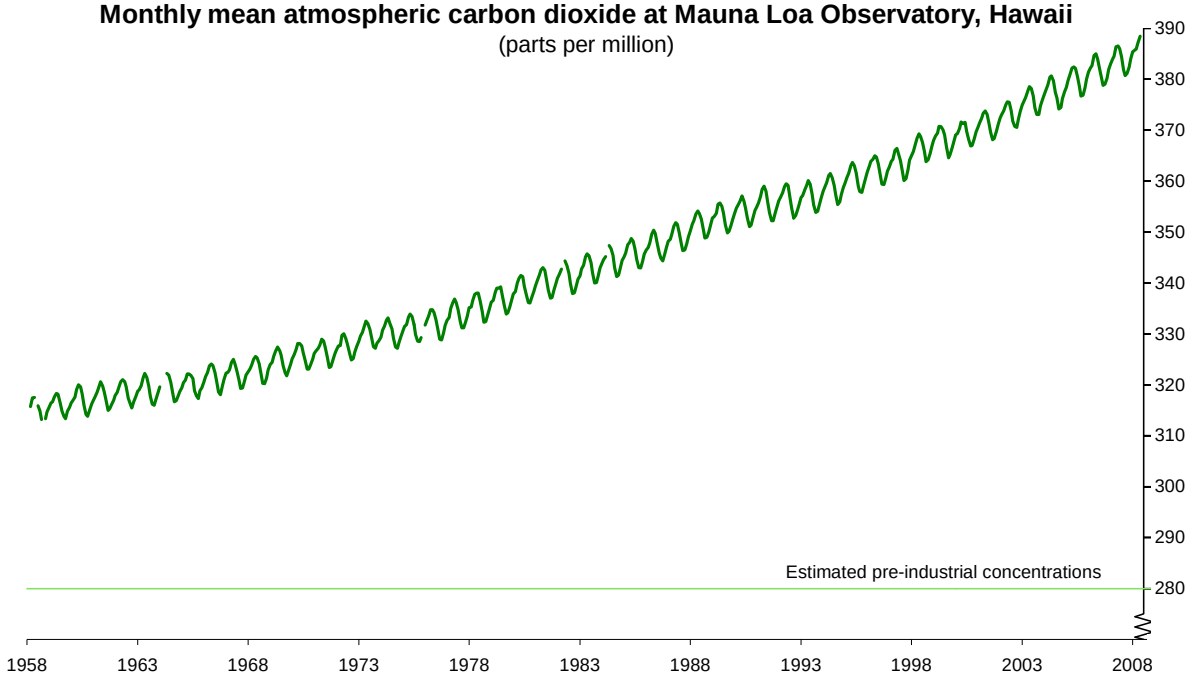
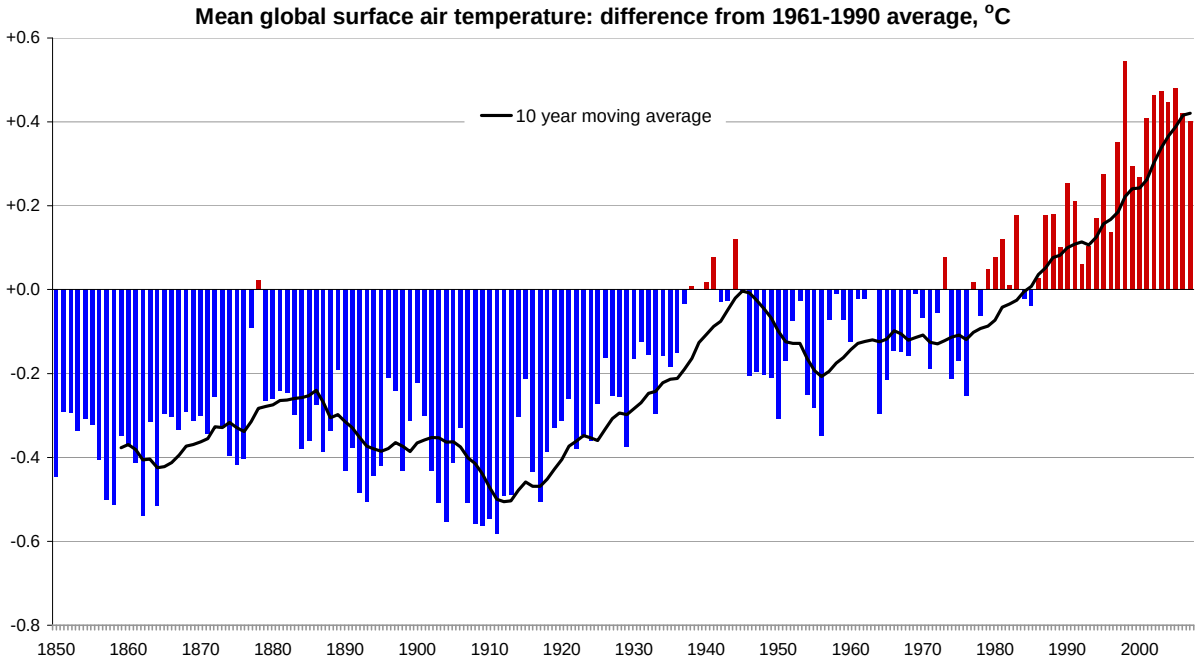
[220] All parties including recent ratifies such as Australia and Croatia.
[221] Excludes emissions from land use change and forestry.
[222] UNFCCC GHG data interface unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/items/4146.php
[223] *IPCC Fourth Assessment Report -Working Group III Report "Mitigation of Climate Change"*, IPCC. Chapter 1
[224] ibid.

Monthly mean atmospheric carbon dioxide at Mauna Loa Observatory, Hawaii
(parts per million)



Source: US National Oceanographic & Atmospheric Administraton -Global Monitoring Division www.cmdl.noaa.gov/index.php

Mean global surface air temperature: difference from 1961-1990 average, °C



Source: UEA Climatic Research Unit. www.cru.uea.ac.uk