

March 2008

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions



**World
Development
Movement**

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

By Tim Jones

About World Development Movement

WDM campaigns to tackle the root causes of poverty. With our partners around the world, we win positive change for the world's poorest people. We believe that charity is not enough. We lobby governments and companies to change policies that keep people poor. WDM is a democratic membership organisation of individuals and local groups.

Like what we do? Then why not become a member of WDM or make a donation?

You can call +44 (0)20 7820 4900 or join/donate online at: www.wdm.org.uk/join
www.wdm.org.uk/donate

World Development Movement, 66 Offley Road, London, SW9 0LS, UK
+44 (0)20 7820 4900 www.wdm.org.uk wdm@wdm.org.uk



We can stop climate chaos

WDM supports 'I Count', the campaign of the Stop Climate Chaos coalition.
www.stopclimatechaos.org.uk

Contents

Summary	4
1. Introduction	5
2. Aviation is a major part of the UK's contribution to climate change	7
2.1 Calculating emissions	7
2.2 Comparing aviation with other sectors of the UK economy	8
3. Excluding aviation undermines the climate change bill	10
3.1 Emissions invisible: CO ₂ from international aviation	10
3.2 Emissions invisible: Non-CO ₂ from aviation	11
4. Excluding aviation from the climate change bill makes no sense	13
4.1 The government's argument for excluding aviation is weak	13
4.2 Excluding aviation does not make economic sense	14
4.3 Excluding aviation does not make social sense	16
4.4 Excluding aviation does not make political sense	16
4.5 Shipping	16
5. Using carbon credits undermines the climate change bill	18
5.1 Carbon credits in the climate change bill	18
5.2 Current use of carbon credits to meet reduction targets	19
5.3 Future use of carbon credits to meet reduction targets	20
6. The government's argument for using carbon credits is weak	23
6.1 The UK's <i>own</i> emissions have to be reduced	23
6.2 Carbon credits do not offset UK emissions	24
7. What the UK government should do	29
Appendix	30
References	33

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

Summary

The UK government's climate change bill does not currently include most greenhouse gas emissions from UK aviation. It also allows emission reduction targets to be met by buying carbon credits from overseas rather than reducing emissions in the UK. In order to cut the UK's contribution to climate change, aviation must be fully included within the climate change bill, and targets must be met through reducing the UK's actual emissions.

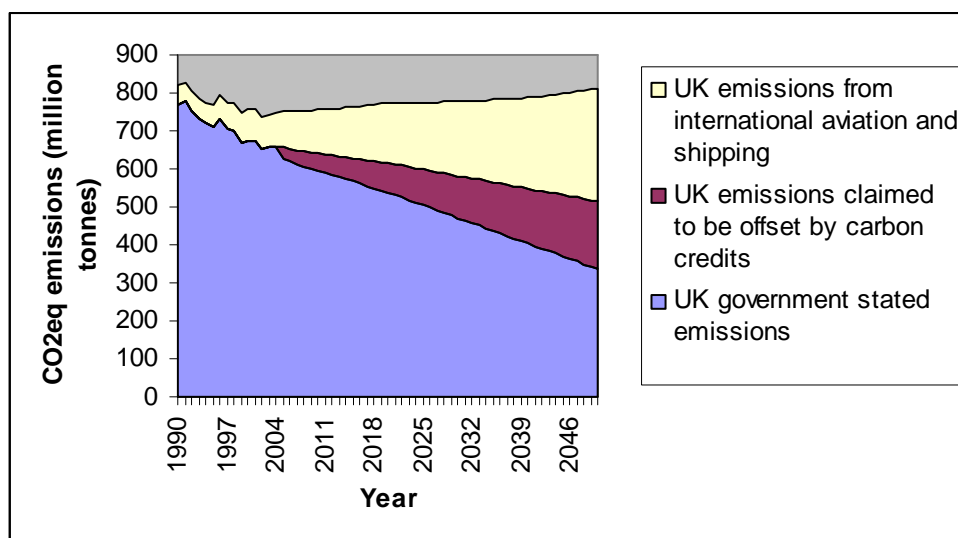
The UK government currently ignores a significant proportion of the UK's contribution to climate change:

- Emissions from the UK's share of international aviation and shipping are ignored in government targets. These currently account for 42.4 million tonnes of CO₂ (99.3 million tonnes of CO₂eq).
- The UK government claims 33.8 million tonnes of UK CO₂ emissions in 2006 were offset by paying for cuts in emissions elsewhere in the world. The government counts these offsets as reducing the UK's *own* emissions.
- This means the UK government currently ignores 76.2 million tonnes of CO₂ emissions, which is more than annual CO₂ emissions from Sweden.¹

The climate change bill will not reduce the UK's contribution to climate change. If the targets in the climate bill are met:

- By 2020, the UK's contribution to climate change reported by the UK government will have *fallen* by 13 per cent on current levels.
- By 2020, the UK's actual contribution to climate change will have *increased* by 3 per cent on current levels.
- By 2050, the UK's contribution to climate change reported by the UK government will have *fallen* by 46 per cent on current levels.
- By 2050, the UK's actual contribution to climate change will have *increased* by 8 per cent on current levels.

Graph 1. UK stated and actual contribution to climate change, 1990-2050



1. Introduction

*"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."*²

United Nations Development Programme, Human Development Report 2007/8

Climate change is an urgent and real threat to people throughout the world. The poorest communities in the world will be those affected first and worst. For instance, unless climate change is limited, rising temperatures could lead to the disappearance of glaciers on which over one-sixth of the world's population depend for dry season water supplies.³ Millions more people could be flooded every year due to sea-level rise by the 2080s.⁴

But it is the richest countries and communities which make the greatest contribution to climate change. The average UK citizen emits 13 tonnes of CO₂ a year compared with 3 tonnes in China, 1 tonne in India, and 0.3 tonnes in Bangladesh.⁵ Drax coal power station in the UK emits more CO₂ in one year than Uganda, Kenya, Tanzania, Malawi, Zambia and Mozambique combined.⁶ It is the richest countries that must therefore take the lead in combating climate change.

The UK government is currently passing a climate change bill through parliament which aims to set legally binding targets for reducing UK CO₂ emissions by 26 per cent by 2020 and 60 per cent by 2050, on 1990 levels.⁷ This is less than required by current scientific estimates, which suggest the UK needs to reduce by 40 per cent by 2020 and more than 80 per cent by 2050.¹ Despite this, the draft bill is a welcome statement of intent by the UK government, setting in place a framework that could potentially shift the UK to becoming a low carbon economy.

However, in addition to the weak targets, the bill contains two critical flaws which mean it will not reduce the UK's contribution to climate change. The bill does not include the UK's share of international aviation and shipping within its targets. The bill also allows for a significant proportion of UK emission reductions to be achieved through buying carbon credits from overseas, rather than making reductions in the UK.

Taking these two factors into account, the climate change bill will not lead to any reduction in the UK's contribution to climate change between now and 2050. In fact, the climate change bill allows for the UK's contribution to climate change to be higher in 2050 than it is at the moment.

¹ The Intergovernmental Panel on Climate Change reported in 2007 that in order for the average global temperature rise to be kept to 2.0-2.4°C, global emissions need to be reduced by 50-85 per cent on 2000 levels.¹ Given that the UK emits more than double the worldwide average emissions per person, the UK needs to reduce emissions by 40 per cent by 2020 and more than 80 per cent by 2050.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

In Chapter 2, WDM shows how aviation already makes up a significant proportion of the UK's contribution to climate change; more than UK cars, home heating or manufacturing.

In Chapter 3, WDM demonstrates how the combination of planned aviation expansion in the UK and excluding international aviation from the climate change bill will massively reduce the impact of the bill.

In Chapter 4, WDM explains how the government's arguments for excluding international aviation from the bill do not stack up and how it makes no economic, social or political sense to create this loophole.

In Chapter 5, WDM shows how the bill allows the government to use the purchase of carbon credits from overseas to meet UK emission reduction targets. This, alongside the exclusion of aviation from the bill, means that the climate change bill will not reduce the UK's actual contribution to climate change. In fact, emissions could be higher in 2050 than they are today.

In Chapter 6, WDM shows how carbon credits prevent the creation of a low carbon economy in the UK, which is needed to generate the technologies and ideas to reduce emissions around the world. Furthermore, it outlines how carbon credits often do not lead to genuine, verifiable reductions in emissions.

WDM concludes by calling on the UK government to include international aviation emissions in the bill's reduction targets from the outset. We also call on the government to make the targets for the climate change bill only apply to emission reductions in the UK, rather than allowing targets to be met through buying dubious carbon credits from overseas. Unless these two loopholes in the bill are closed, the climate change bill will not set a framework for creating a low carbon economy in the UK.

2. Aviation is a major part of the UK's contribution to climate change

2.1 Calculating emissions

The UK government does not include greenhouse gas emissions from international transport within its official reporting and targets on the UK's contribution to climate change. This decision stems from the fact that the Kyoto protocol does not include international transport emissions. However, just because there is no global political agreement on how to count such emissions, it does not mean they make no contribution to climate change.

The UK government does report on international aviation and shipping as a memo item in its reporting on carbon dioxide emissions. In 2006, the UK's share of international aviation and shipping were reported as producing 42.4 million tonnes of CO₂ – 7.1 per cent of the UK's total CO₂ emissions.⁸ Of this, international aviation accounts for 35.6 million tonnes and international shipping 6.8 million tonnes.

However, CO₂ is not the only determinant of the UK's contribution to climate change. The UK government also reports on emissions of five other greenhouse gases: methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. The contribution of these greenhouse gases is expressed in terms of the equivalent amount of carbon dioxide (CO₂eq) which would have produced the same warming.

Again, this does not cover all the non-CO₂ contributors to climate change generated by the UK. Emissions of nitric oxide, nitrogen dioxide and water vapour by aviation at altitude also contribute to global warming. Estimates of the extent of the extra warming generated by these vary. In 1999, the Intergovernmental Panel on Climate Change (IPCC) calculated that up until 1992, the warming caused by aviation was 2.7 times that of the warming of its CO₂ emissions alone. It went on to predict that between 1992 and 2050, the warming caused by aviation would be 2 to 4 times larger than aviation's CO₂ emissions alone.⁹

The UK government accepts that aviation makes a greater contribution to climate change than CO₂ emissions alone. The Treasury's pre-budget report in 2006 stated that aviation makes a contribution to climate change 2 to 4 times greater than CO₂ emissions.¹⁰ The Department for Transport uses a figure of 2.5 times more warming from UK aviation than CO₂ alone.¹¹ Given that this is a specific figure accepted by the UK government, this report multiplies aviation CO₂ emissions by 2.5 to give the CO₂eq emissions of UK aviation.

The UK government reports that in 2006, the latest year for which figures are available, the UK's contribution to climate change was the equivalent of emitting 652.3 million tonnes of CO₂ (throughout this report, this is expressed as CO₂eq).¹² However, this figure does not include CO₂ emissions from the UK's share of international aviation and shipping, or the non-CO₂ emissions of domestic and international aviation. These 'invisible emissions' totaled 99 million tonnes of CO₂eq in 2006.¹³ The UK government therefore ignores 13 per cent of the UK's contribution to climate change in its official figures and targets (see Table 1 below).

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

Table 1. Official and actual UK contribution to climate change in 2005¹⁴

Stated emissions	UK CO ₂ eq emissions in 2006
Official UK government figure	652.3 million tonnes
CO ₂ emissions from international aviation and shipping	42.4 million tonnes
Non-CO ₂ emissions from domestic and international aviation	56.9 million tonnes
Total UK emissions	751.6 million tonnes

2.2 Comparing aviation with other sectors of the UK economy

The UK government and the aviation industry both attempt to suggest that aviation makes-up a tiny proportion of the UK's contribution to climate change. David Miliband, when Secretary of State for the Environment, said: *"Air flights are responsible for about 2 per cent of CO₂ emissions, 3 per cent of CO₂ equivalent."*¹⁵ Ryanair have paid for adverts in the UK press asserting that *"aviation accounts for 2 per cent of CO₂ emissions"*.

The intention of such rhetoric from the government and aviation industry is to deflect attention away from the need for government action to limit aviation's contribution to climate change. The figures used by the government and industry are misleading. The figures they quote are estimates for global emissions from aviation, which may well be underestimates.

For UK government policy, it is the proportion of *UK emissions* from aviation which is important. UK international and domestic aviation emitted 37.9 million tonnes of CO₂ in 2006.¹⁶ This is 6.3 per cent of the UK's total CO₂ emissions. However, once the multiplier of 2.5 is applied to aviation emissions, and greenhouse gas emissions from other sources are included, aviation is responsible for 12.6 per cent of the UK's contribution to climate change.¹⁷

UK aviation makes a greater contribution to climate change than UK cars; UK manufacturing and construction; or emissions direct from UK residential buildings¹ (see Table 2 below). The only sector which makes a greater contribution to climate change than UK aviation is public electricity and heat.

¹ Does not include electricity consumption from the national grid.

Table 2. UK contribution to climate change by sector in 2006¹⁸

Emissions source	Emissions (CO₂eq million tonnes)	Per cent of UK's contribution to climate change
Public electricity and heat	184.8	24.6
Aviation ⁱ	94.8	12.6
Manufacturing and construction	84.3	11.2
Residential	80.2	10.7
Passenger cars	73.3	9.8
Other road transport	52.4	7.0
Agriculture	48.7	6.5
Energy production	46.1	6.1
Commercial and institutional buildings	21.7	2.9
Waste treatment	21.6	2.9
Industrial processes	16.3	2.2
Shipping ⁱⁱ	12.3	1.6
Military aviation and shipping	2.7	0.4
Railways ⁱⁱⁱ	2.6	0.3
Other	11.8	1.6
Land-use change	-2.0	-0.3
Total	751.6	100

(Calculations for this table are in the Appendix)

ⁱ Domestic and international.

ⁱⁱ Domestic and international.

ⁱⁱⁱ Only diesel – emissions from electric trains are counted under public electricity.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

3. Excluding aviation undermines the climate change bill

3.1 Emissions invisible: CO₂ from international aviation

*"I have no doubt that aviation and shipping ought to be included [in the targets in the climate change bill]. ... I feel it is an anomaly that should be dealt with."*¹⁹

Sir David King, when chief scientific adviser to the UK government

The UK government's draft climate change bill sets a target of reducing CO₂ emissions by 26 per cent on 1990 levels by 2020 and 60 per cent on 1990 levels by 2050.²⁰ However, the draft bill fails to include CO₂ emissions from international transport, non-CO₂ emissions from aviation, and the five other greenhouse gases recognised in the Kyoto protocol.

The UK government is currently supporting a massive expansion in UK aviation, with a planned doubling of air passengers between 2002 and 2020, and a doubling of air freight between 2002 and 2010. The government's 2003 aviation white paper supports new runways at Edinburgh, Birmingham International, Stansted and Heathrow airports. In addition, the government's white paper supports other airport expansion measures, such as new terminals or longer runways, at a total of 24 different airports in the UK.²¹

The Tyndall Centre for Climate Change has predicted that unless the government's policy changes on aviation expansion, CO₂ emissions from UK aviation will have more than doubled by 2030 and trebled by 2050.²² Another study by Owen and Lee for Defra predicts even higher emissions growth for UK aviation, doubling by 2030 and more than trebling by 2050, even though it is for scheduled traffic only.²³

The Department for Transport estimates for emissions growth follow a similar trajectory as the independent estimates until 2030. However, the Department for Transport predict there will be greater improvements in aircraft efficiency after 2030, and so aviation emissions will not increase between 2030 and 2050.

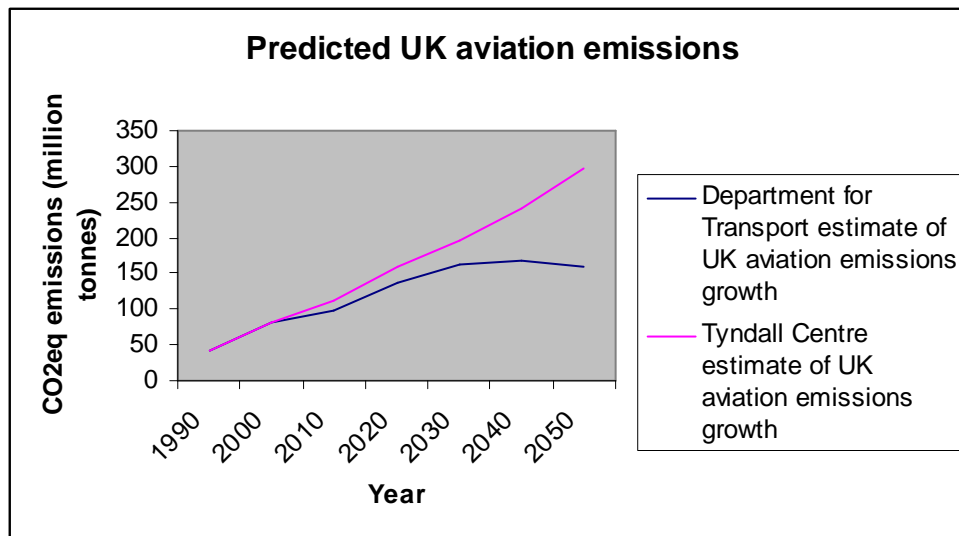
Table 3. Different predictions for emissions from UK aviation (million tonnes of CO₂eq)

Year	Tyndall Centre	Owen and Lee ⁱⁱ	Department for Transport
2010	111	79.8	99
2020	158.5	122	136.5
2030	195.3	168.8 – 204.5	162.3
2050	296	269.5 – 407	159.5

ⁱ Edinburgh, Glasgow International, Glasgow Prestwick, Aberdeen, Dundee, Inverness, Cardiff International, Belfast International, Manchester, Liverpool John Lennon, Blackpool, Carlisle, Newcastle, Teesside International, Leeds-Bradford International, Birmingham International, East Midlands, Bristol International, Bournemouth International, Exeter International, Stansted, Heathrow, Gatwick, Luton.

ⁱⁱ This estimate is for scheduled traffic only.

Graph 2. Different predictions for emissions from UK aviation



The estimates for aviation growth by the Tyndall Centre and Owen and Lee are more independent than the estimates by the Department for Transport. The Owen and Lee estimate does not cover all emissions from UK aviation. Therefore, this report uses the Tyndall Centre's estimate for the growth in UK aviation emissions to predict the UK's contribution to climate change up until 2050.

3.2 Emissions invisible: Non-CO₂ from aviation

The draft climate change bill does not include non-CO₂ contributors to climate change. The figures below take account of all contributors to climate change, including the multiplier on aviation emissions of 2.5 times the CO₂ alone.

The analysis assumes that:

- There are no further cuts in methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride beyond those which have occurred from 1990 to 2006ⁱ
- CO₂ emissions reported by the UK government are cut as targeted
- Aviation emissions grow as predicted by the Tyndall Centre for Climate Change Research, and international shipping emissions remain constant.

The UK government is only recognising a portion of the UK's contribution to climate change in its targets for a 26 per cent cut in CO₂ emissions by 2020 and 60 per cent cut by 2050. The estimate in Table 4 below is that even if the government achieves these targets for reducing CO₂ from some sources, the UK's actual contribution to climate change will have fallen by 15 per cent by 2020 on 1990 levels and by 23 per cent by 2050. On current levels, there will be cuts of just 8 per cent by 2020 and 17 per cent by 2050.

ⁱ This may be a slightly harsh assumption. From 2002 to 2006, CO₂eq emissions from the basket of five greenhouse gases fell by 12 per cent. However, the government does not include targets for the five greenhouse gases in its draft climate change bill, and so no evaluation can be made of future falls under the terms of the bill.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

By 2050, the government will be reporting CO₂eq emissions of 335.3 million tonnes. In reality, there will be an additional 291.9 million tonnes of emissions from international aviation and shipping, and extra warming from non-CO₂ emissions from domestic aviation. The government will be ignoring *almost half* of the UK's contribution to climate change in 2050. The Department for Transport predicts that under current policies, aviation will account for one-third of the UK's contribution to climate change by 2050 even though this is based on its lower predictions for aviation growth.²⁴

Table 4. Actual reduction in UK's contribution to climate change, 1990-2050

Year	Government targeted CO ₂ eq emissions	Actual CO ₂ eq emissions
1990	770.8	818.8
2006	652.3	751.6
2020	535.7	694.8
2050	335.3	636.3

4. Excluding aviation from the bill makes no sense

4.1 The government's argument for excluding aviation is weak

"With regard to emissions from international aviation and shipping, the Bill provides that these emissions could be included in the UK's carbon budget once international agreement is reached on how to attribute these emissions to individual countries – currently there is no such agreement. The issues here are complex, in particular because there is no international agreement on how to allocate these emissions between countries. For example, how do you allocate emissions from a flight from London-Sydney which stops to refuel in Dubai?"²⁵

Hilary Benn, secretary of state for environment

Under the Kyoto protocol, Annex I countries such as the UK have to report on international aviation and shipping emissions. However, these are not included in the official Kyoto targets. The UK's international aviation and shipping emissions are calculated on the basis of all fuel taken on-board the plane or ship at UK airports or seaports. Defra reports on these emissions every year, and has figures for them going back to 1970. It would be simple to include them in the government's reporting and targeting in the climate change bill.

Defra's methodology provides a reasonably accurate measure of UK aviation emissions. By counting all the emissions from international flights leaving the UK, but none from those landing in the UK, it is a fair estimate. Possible problems such as the London-Sydney-Dubai example that Hilary Benn uses are relatively rare.

Moreover, incorporating international aviation in the bill would at least include the emissions from the London-Dubai flight, if not the Dubai-Sydney flight. By excluding international aviation completely, none of these emissions would count. Using Defra's figures for UK international aviation emissions is far more accurate than pretending that UK international aviation emissions are zero, as the current bill does.

The Department for Transport has said: "The GHGI [Greenhouse Gas Inventory] figures are assessed using a transparent and verified methodology which offers an approximate but reliable basis for assessing the impact of UK aviation."²⁶

Ideally, there would be international agreement on how to divide international aviation emissions between countries, which would be included in an equitable global agreement to cut emissions from 2012. Provision can be placed in the bill that once international agreement has been reached, the methodology for counting UK international aviation emissions would be amended to be in line with the international agreement. But it makes far more sense to include aviation emissions from the start, and amend later if needed, than ignore altogether, and suddenly get a large change in UK targets once international agreement has been reached.

The Secretary of State for Transport, Ruth Kelly, wrote to UK NGOs in January 2008 saying: "The targets in the Climate Change Bill currently exclude international aviation emissions as, at the moment, there is no agreed way of allocating responsibility for these to

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

individual countries. We are pressing to resolve this and to develop and agree effective policies that will deliver a strong environmental outcome from the sector. *We must be careful not to prejudice international discussions towards these goals* [Emphasis added].”²⁷ The implication here is that including international aviation emissions in the bill would undermine the negotiations on getting an international agreement on including aviation within global targets.

However, the opposite is true. If the UK were to include international aviation emissions in the climate change bill, it would be putting into place an effective framework for reducing the UK's contribution to climate change, and would therefore create the space for others to follow. Whilst the UK holds less than one per cent of the world's population, one-in-five flights globally either departs or arrives at a UK airport.²⁸ The UK has the second largest aviation industry in the world.²⁹ Aviation makes up a greater share of the UK's contribution to climate change than of any other major economy (see Table 5 below). As a major player in the international aviation industry, UK leadership is vital in securing action on limiting international aviation emissions.

Table 5. Aviation emissions by country, 2004¹,³⁰

Country	Aviation CO ₂ emissions in 2004 (million tonnes)	Aviation's share of country's CO ₂ emissions (per cent)	Aviation's share of country's contribution to climate change (per cent)
UK	35.5	6.1	12
France	24.1	5.9	11
Netherlands	12.5	4.7	9
US	261.8	4.4	8
Spain	15.5	4.3	8
Australia	15.1	3.9	7
Canada	20.7	3.5	7
Japan	36.3	2.9	5
Germany	24.5	2.8	5
Italy	12.1	2.5	5

4.2 Excluding aviation does not make economic sense

Excluding aviation emissions from the bill will have a significant impact on the relative contributions to climate change of different sectors of the UK economy. Whilst emissions from aviation will be allowed to grow, other sectors of the economy should be making large cuts in emissions. Table 6 below estimates how the 627.6 million tonnes of CO₂e_q produced by the UK in 2050 will be split between sectors:

- It assumes that, as under current government policy, both domestic and international aviation are allowed to continue to grow.
- Emissions from the basket of five non-CO₂ greenhouse gases are constant.

¹ Figures are only available for UNFCCC Annex-1 countries. China and India are also in the ten largest economies in the world, but it is fair to say that China and India's aviation emissions as a share of their contribution to climate change are well below that of most rich countries.

- CO₂ emission reductions are split equally between all sectors other than aviation.

Table 6. Emission reductions by sector, 2006-2050³¹.

Emissions source	Emissions in 2050 (CO ₂ eq million tonnes)	Percentage change on 2006 levels	Per cent of UK's contribution to climate change
Aviation ⁱ	296	+212	46.5
Public electricity and heat	80.1	-57	12.6
Agriculture	46.2	-5	7.3
Manufacturing and construction	37.4	-56	5.9
Residential	34.8	-57	5.5
Passenger cars	34.1	-53	5.4
Energy production	25.1	-46	3.9
Other road transport	23	-56	3.6
Waste treatment	21.4	-1	3.4
Other	11.5	-3	1.8
Commercial and institutional buildings	9.3	-57	1.5
Shipping ⁱⁱ	8.6	-30	1.4
Industrial processes	8.3	-49	1.3
Railways ⁱⁱⁱ	1.3	-50	0.2
Military aviation and shipping	1.2	-56	0.2
Land-use change	-2.0	0	-0.3
Total	636.3		100

(Calculations for this table are in the Appendix)

There is no sound economic justification for facilitating a massive increase in aviation emissions while at the same time trying to reduce emissions in other sectors of the UK economy. The Environmental Audit Committee has said that if the government continues its policy of allowing just the aviation industry to grow, it will either cause severe pain to all other sectors or provoke so much opposition as to “fatally undermine its 2050 target.”³²

The government argues that it is not prescribing that any particular sector should increase or decrease emissions. In a letter to NGOs, Secretary of State Ruth Kelly said, “the priority for the Government is to reduce greenhouse gas emissions across the economy as a whole, rather than focussing narrowly on individual sectors – within that goal some sectors may reduce their emissions and others may increase theirs.”³³

However, to meet the targets in the climate bill, other sectors do not have to reduce their emissions by more to compensate for the growth in aviation. Aviation emissions are not included in the targets, so the UK government does not recognise that they are part of the ‘goal’ of reducing emissions. For the UK government’s strategy to work – other sectors

ⁱ Domestic and international.

ⁱⁱ Domestic and international.

ⁱⁱⁱ Only diesel – emissions from electric trains are counted under public electricity.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

reducing by more to compensate for the growth in aviation – emissions from aviation have to be included in the climate bill.

4.3 Excluding aviation does not make social sense

As just described, excluding international aviation related CO₂ and non-CO₂ emissions from the bill means that other sectors in the UK economy will have to shoulder the responsibility for emission reductions. Much obviously depends on how emissions reductions are achieved but it is worth considering the potential social justice implications of excluding aviation (at least in the short to medium term) while requiring emissions reductions in other sectors. The richest 18 per cent of the UK population are responsible for 54 per cent of flights, whilst the poorest 18 per cent are responsible for just 5 per cent.³⁴

The growth in flying over the past few years has been due to richer people flying more, whilst those on the lowest incomes are actually flying *less*. In 2000, over 8 million leisure trips were taken from UK airports by passengers earning less than £14,374 a year. In 2004, the same group of people flew less, with just over 7 million trips. In contrast, people earning over £28,750 a year made 28.8 million leisure trips in 2000, and this rose to 36.5 million in 2004.³⁵ Compared to greenhouse gas emissions reduction in other sectors, it may be that curbing growth in aviation emissions is one of the more socially progressive actions the government could take.

4.4 Excluding aviation does not make political sense

This report demonstrates that we must address emissions from aviation if we hope to tackle climate change. Right now, the government has the choice to curb the growth in aviation emissions. Delaying action on aviation will only make limiting aviation emissions more difficult both politically and practically, as the UK will be in the position of needing to reduce emissions from an expanded and even more economically (and politically) significant aviation industry. Proposing measures now that will create jobs in other sectors, and at the same time halt the growth in aviation, is surely better, and politically more palatable, than having to propose measures in future that will require cut backs, and potential job losses, in aviation.

The current government strategy is like planning to binge-eat and become addicted to fast-food knowing that a difficult crash-diet will be needed in the future. Surely it is better to start consuming in moderation now?

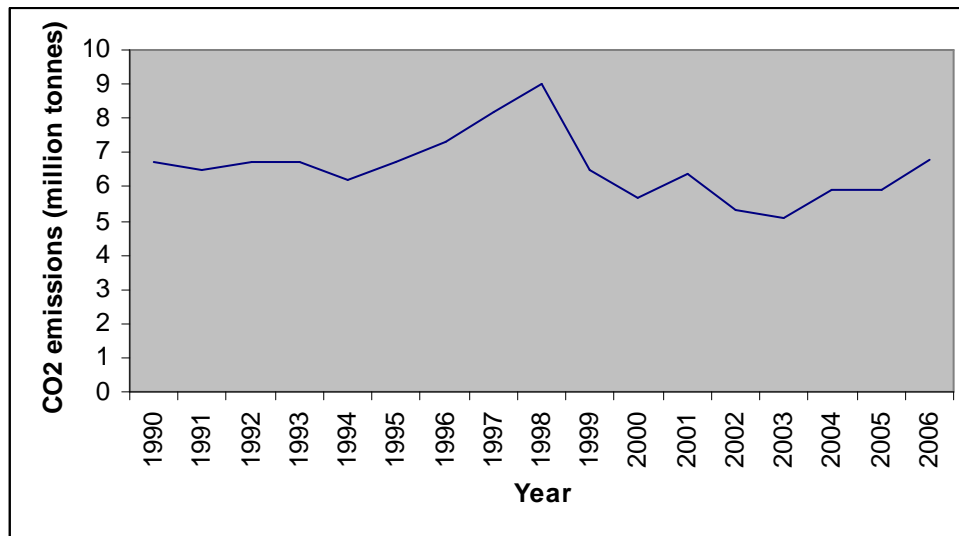
4.5 Shipping

The UK's share of CO₂ emissions from international shipping are also reported by the UK government, but not included in the climate change bill or government targets. The emission figures are based on fuel taken-on-board ships at UK seaports, in the same way as planes at airports.

Ships use fuel as ballast, and so are therefore not dependent on taking on fuel at their point of departure in the same way as planes. For the UK figures, there is no discernable trend in CO₂ emissions from shipping (see Graph 3 below).

UK imports and exports increased by 70 per cent in monetary terms (2005 prices) between 1990 and 2006.³⁶ Whilst this is not conclusive, it suggests that UK emissions from international shipping should have been increasing, but this is not seen in the official figures. It appears likely that there is a trend for ships trading to and from the UK to fuel at non-UK ports, and so the figure for emissions from UK shipping is likely to be an underestimate.

Graph 3. UK government reported emissions from the UK's share of international shipping



The figures for UK emissions from international shipping are therefore less accurate than those for international aviation. This is potentially a reason not to include these emissions in the climate bill. However, including the current estimated emissions would be better than not including any emissions at all from international shipping.

At the least, the climate bill should be amended so that the UK government has a duty to develop a methodology and produce figures to more accurately estimate the UK's share of international shipping emissions, and that these figures have to be used to include emissions from shipping in the climate bill from 2012. The UK government should also push for strong European and international action on shipping emissions. Producing a methodology and figures for the UK would help take-forward the process of including emissions from international shipping in negotiations on reducing global emissions from 2012.

In this report, we assume that the UK's share of international shipping emitted 6.8 million tonnes of CO₂ in 2006 – the figure reported by the UK government – and continues to do so until 2050. However, in reality, emissions in 2006 were probably higher, and they are likely to be increasing.

5. Using carbon credits undermines the climate change bill

5.1 Carbon credits in the climate change bill

The climate change bill allows the targets for UK emission reductions to be achieved through buying “carbon credits” from overseas. The UK can buy credits from developing countries, which are claimed to have helped the developing country reduce its greenhouse gas emissions. The UK government can then include this emissions reduction within its targets, meaning that it does not actually have to reduce emissions in the UK. In reality, the emissions from the UK have still taken place.

The UK can also buy emissions reductions elsewhere in Europe. Under the European Union's Emissions Trading Scheme, a company in the UK can pay for a company elsewhere in Europe to reduce emissions, rather than make cuts of its own. This is complicated by the fact that under the Emissions Trading Scheme, European companies can also buy carbon credits from developing countries, rather than pay for emission reductions in Europe.

When the government consulted on the draft climate change bill, they asked for views as to what percentage of the government's reduction target could be met through buying carbon credits from overseas. However, the climate change bill going through parliament does not set any upper limit on the use of carbon credits. Hilary Benn, the Secretary of State for the Environment, says that “the CCC [Committee on Climate Change] is required to set out its views on the balance between domestic effort and use of international credits in meeting the budget. The Government will be required to take this into account when setting the level of the budget and deciding on the amount of international credits that may be used.”³⁷

No decision has therefore yet been taken as to whether there will be an upper limit on the amount of targeted emission reductions which can actually be achieved just by buying carbon credits. In theory, all of the 60 per cent emissions reductions targeted by the government could be accounted for through buying carbon credits – none of the reductions actually need to take place in the UK.

In the consultation on the draft climate change bill, the UK government said: “Do you agree that, in line with the analysis in the Stern Review and with the operation of the Kyoto Protocol and EU ETS [Emissions Trading Scheme], effort purchased by the UK from other countries should be eligible in contributing towards UK emissions reductions, within the limits set under international law?”

There are no specific limits under international law. Under the Kyoto protocol, rich countries have to meet a “significant proportion” of their emission reduction targets through action at home rather than buying credits from abroad.³⁸

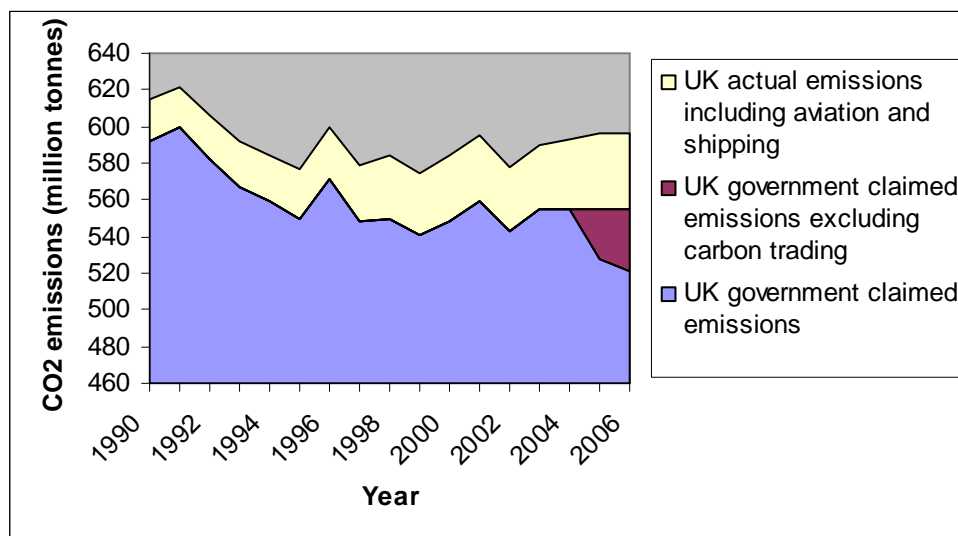
What is clear is that the government expects and is allowing for a significant proportion of targeted emission reductions to happen through buying carbon credits from overseas. Hilary Benn has said that there will be a “balance” between emissions reductions in the UK and buying credits from overseas.

The climate change bill also allows for a large expansion in carbon trading, beyond the European Union Emissions Trading Scheme. A whole section of the climate change bill gives the government powers to create new trading schemes, such as the proposed Carbon Reduction Commitment – a carbon trading scheme for large organisations like supermarkets which are not covered by the EU Emissions Trading Scheme.

5.2 Current use of carbon credits to meet reduction targets

The UK government has recently started to use carbon credits to claim that it is meeting emissions reduction targets. In January 2008, Defra announced UK greenhouse gas emissions figures for 2006. In the press release Defra claimed: "The UK's greenhouse gas emissions are now 16.4 per cent lower than 1990 levels. When the effect of the EU Emissions Trading Scheme included, the overall reduction is 20.7 per cent."³⁹ Defra say that in 2006 the UK paid for 33.8 million tonnes of CO₂ reductions from overseas which it now counts towards meeting UK emission targets.

Graph 4. UK CO₂ emissions from 1990 – 2006



Between 2004 and 2006, the UK government claims that CO₂ emissions have been reduced by 6.2 per cent, a fall of 34.4 million tonnes of CO₂. However, 33.8 million tonnes of this reduction – 98 per cent – is from carbon credits bought from overseas. Virtually all the UK's claimed reduction in emissions between 2004 and 2006 comes from buying carbon credits rather than making emissions reductions in the UK.

The UK government has a target to reduce UK CO₂ emissions by 20 per cent on 1990 levels by 2010 (not including international aviation and shipping). By 2006, CO₂ emissions were only 6.4 per cent below the 1990 level, and were not falling (see Graph 4 above). However, the government has now changed its target to allow carbon credits bought from overseas to be included in emission reduction targets. The government therefore claims the 2010 target will be met. The Environmental Audit Committee has said: "without the expected contribution of Phase II of the EU ETS [Emissions Trading Scheme], UK carbon emissions

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

in 2010 are projected to be only just over halfway to the 20% target, a very significant shortfall."⁴⁰

In evidence to the Joint Committee of Parliament on the draft climate change bill, the Environment Agency revealed that the government is anticipating that 70 per cent of the emission reductions which will take place under Phase 2 of the EU Emissions Trading Scheme (2008-2012) will come from the purchase of foreign credits, rather than emission reductions in the UK.⁴¹

5.3 Future use of carbon credits to meet reduction targets

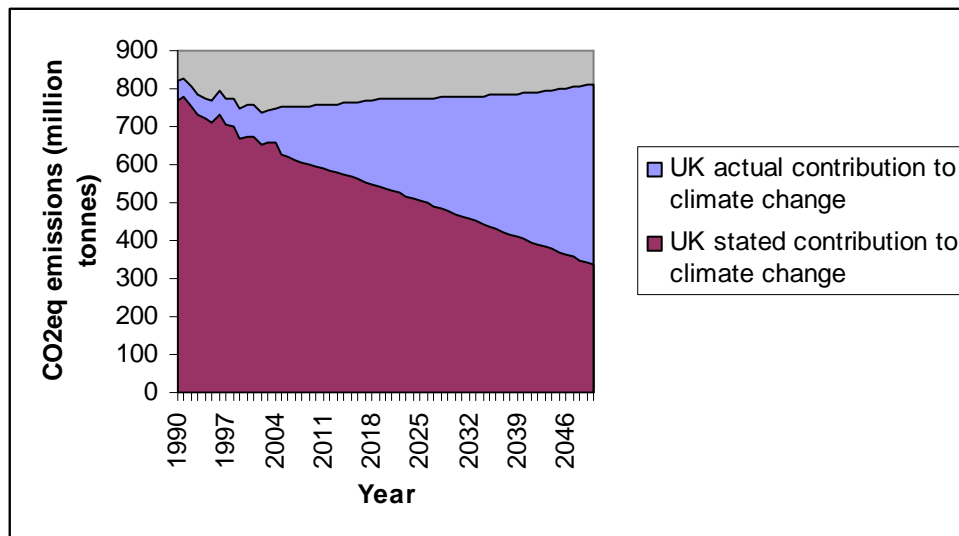
In the analysis below we assume that the UK makes half of its claimed CO₂ emissions reductions by buying carbon credits from abroad, and half the emission reductions in the UK. Such an amount is possible under the terms of the climate change bill, and under current UK government policy of using carbon trading as *the* way to tackle climate change, it is highly likely.

UK official CO₂ emissions were 592.4 million tonnes in 1990.⁴² Meeting the climate bill target of a 26 per cent reduction on this level by 2020 requires a cut of 154 million tonnes of CO₂, taking total emissions down to 438.4 million tonnes of CO₂. Half of the targeted reduction could come from buying credits from overseas – 77 million tonnes of CO₂. Actual UK emissions would be 515 million tonnes of CO₂ in 2020, a 13 per cent reduction on 1990 levels.

Meeting the climate bill target of a 60 per cent reduction on 1990 levels by 2050 requires a cut of 355.3 million tonnes of CO₂, taking UK annual emissions to 236.8 million tonnes of CO₂. Again, half of the targeted reduction can be avoided by buying carbon credits from overseas – 177.7 million tonnes of CO₂. Actual CO₂ emissions in 2050 would be 414.4 million tonnes of CO₂, a 30 per cent reduction.

However, none of this includes international aviation and shipping. When the effects of the carbon trading provisions in the climate change bill are included in calculations which also incorporate the UK's share of international aviation and shipping, then the climate change bill will mean there is no reduction in the UK's contribution to climate change by 2050 (see Graphs 5 and 6, and Tables 7,8 and 9 below). On current emission levels, the climate change bill allows for the UK's own contribution to climate change to increase.

Graph 5. UK stated and actual contribution to climate change, 1990-2050



Graph 6. UK stated and actual contribution to climate change, 1990-2050

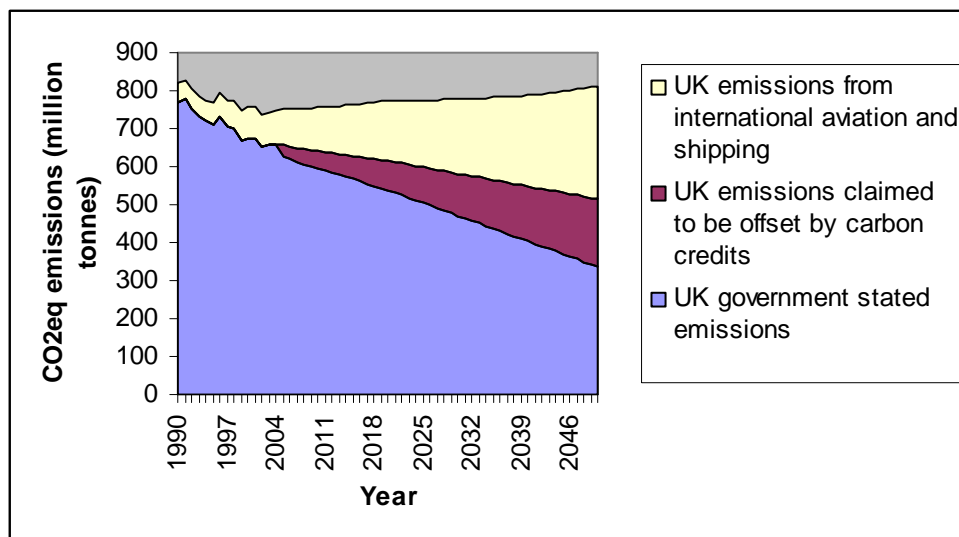


Table 7. Estimated UK contribution to climate change

Year	Government stated CO ₂ eq emissions	Government stated CO ₂ eq emissions plus emissions which the government claims have been offset through buying carbon credits	Actual CO ₂ eq emissions (including international aviation and shipping)
1990	770.8	770.8	818.8
2006	618.5	652.3	751.6
2020	537.8	614.8	775.5
2050	336.4	514.1	809

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

Table 8. Estimated UK contribution to climate change, per cent change on 2006

Year	Government stated CO₂eq emissions	Government stated CO₂eq emissions plus emissions which the government claims have been offset through buying carbon credits	Actual CO₂eq emissions (including international aviation and shipping)
2006	0	0	0
2020	-13	-5.7	+3.2
2050	-45.6	-21.2	+7.6

Table 9. Estimated UK contribution to climate change, per cent change on 1990

Year	Government stated CO₂eq emissions	Government stated CO₂eq emissions plus emissions which the government claims have been offset through buying carbon credits	Actual CO₂eq emissions (including international aviation and shipping)
1990	0	0	0
2006	-19.8	-15.4	-8.2
2020	-30.2	-20.2	-5.3
2050	-56.4	-33.3	-1.2

6. The government's argument for using carbon credits is weak

*"Use of international credits ensures emissions reductions can be achieved in the most cost effective way, while encouraging investment in low carbon technologies in developing countries and encouraging countries to work together – as they must – to tackle climate change."*⁴³

Hilary Benn, secretary of state for environment

*"It is absolutely clear that the developed countries, including Britain, must achieve significant cuts in their own CO₂ and other greenhouse gas emissions regardless of what other people are doing. We may want to, in addition, pay for emissions reductions overseas." Finance for developing countries "has to be in addition to, not instead of, reductions in our own emissions."*⁴⁴

Lord Adair Turner, chair of the UK Committee on Climate Change

6.1 The UK's own emissions have to be reduced

Climate change cannot be tackled through accounting tricks. Rich countries, with 18 per cent of the world's population, account for 54 per cent of emissions. Developing countries, with 82 per cent of the world's population, account for 46 per cent of emissions. It is a simple fact that to tackle climate change:

- Rich countries like the UK *have* to reduce *their own* emissions;
- *And* rich countries like the UK need to help some developing countries, such as China, to curb the growth, and ultimately reduce, emissions
- *And* rich countries like the UK need to help some other developing countries to avoid large increases in emissions.

Carbon credits are used by the UK government as a means to provide some support to developing countries to not increase emissions, without reducing emissions in the UK. Support for emission reductions in developing countries has to be *in addition* to cuts in the UK, not *instead* of cuts in the UK. Reducing global emissions by 50-85 per cent by 2050 is a massive challenge, which will fail if rich countries create accountancy mechanisms to avoid large-scale cuts in their own emissions.

Table 10. Contribution to global CO₂ emissions from fossil fuels (percentage)⁴⁵

	Industrialised countries	Developing countries	UK
Current emissions contribution	54	46	2.0
Historical emissions contribution [†]	69	31	6.2
Share of world population	18	82	0.9

[†] Historical contribution to climate change has been calculated for the period 1850 – 2003; 2003 being the most recent year where figures are available to make this calculation.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

The UK government argues that carbon credits are beneficial because they provide resources for developing countries to reduce their emissions. Hilary Benn, secretary of state for the environment, has written: "Use of international credits ensures emissions reductions can be achieved in the most cost effective way, while encouraging investment in low carbon technologies in developing countries and encouraging countries to work together – as they must – to tackle climate change."⁴⁶

It is true that developing countries need resources and technology to help reduce emissions. We are not arguing against rich countries like the UK providing such assistance. To tackle climate change they have to. But, by claiming that carbon credits are assistance to developing countries, the UK government prevents the true assistance which developing countries need – resources and technology *as well as* emissions cuts in rich countries.

As currently drafted, the UK climate bill does not show the way for rich countries to tackle climate change because it will not lead to the UK being a low-carbon economy. If other industrialised countries follow the UK's current example then we will not avoid dangerous climate change. In addition, there are further problems with carbon credits which we address below.

6.2 Carbon credits do not offset UK emissions

For carbon credits to reduce emissions without having negative impacts, then certain criteria need to be met. The buying of a carbon credit must:

- Result in real emission cuts (cut emissions by at least the level specified in addition to what would have otherwise happened);
- Result in real time emission cuts (cut emissions by at least the level specified, *at the same point in time* as the emissions the project is in theory offsetting)
- Not cause or exacerbate environmental and social harm (meet a set of environmental, social and economic sustainability criteria, including having gained the prior informed consent of all involved and affected communities).

In reality, it is difficult, if not impossible, for these three criteria to be met.

Real emission cuts

For it to be known that a carbon credit cuts emissions in addition to what would have otherwise happened, it must be known what would have otherwise happened. This is the problem of the counterfactual – it can never be known what the alternative course of action would have been. With some carbon credits, the emissions reduction would have happened regardless of whether or not it was 'paid for' to offset emissions in the rich world. In others, the carbon credit does in theory reduce emissions, but also creates other emissions elsewhere.

Under the Kyoto protocol's Clean Development Mechanism (CDM) the largest number of carbon credits have been generated by projects claiming to reduce the potent greenhouse

gas HFC-23,^j rather than CO₂. One study has found that the value of credits given to HFC-23 projects at current carbon prices is €4.7 billion. However, an estimate of the cost of technology needed to capture and destroy the same amount of HFC-23 is €100 million.⁴⁷ Around €4.6 billion has been generated in profit by HFC-23 generating plants, which could then further expand their operations with the reinvestment of this profit.⁴⁸

For example, one Indian chemical company, SRF, made €87 million from the sale of carbon credits in 2006/07. Ashish Bharat Ram, managing director of SRF, claimed: "Strong income from carbon trading strengthened us financially, and now we are expanding into areas related to our core strength of chemical and technical textiles business."⁴⁹

We would argue that mandatory regulations should exist stating that companies have to capture and destroy HFC-23, especially given the relatively low cost of doing so. However, if such regulations exist in a country, then a company cannot claim carbon credits as they would not be viewed as 'additional'. The existence of the carbon market creates a perverse incentive for governments *not* to regulate HFC-23, so that companies can make a windfall profit by selling credits, and generate financial flows into the country.

The Joint Committee of the UK Parliament on the draft climate change bill reported that: "the economic incentives offered by the CDM [Clean Development Mechanism] appear actually to be encouraging the building of refrigerant plants in the developing world, simply in order that the HFC by-products from the plant can be incinerated, and the credits generated from this sold at a large profit."⁵⁰

The same process is now likely to happen for plants producing nitrous oxide (N₂O) another potent greenhouse gas.ⁱⁱ N₂O projects are expected to account for 11 per cent of projects under the Clean Development Mechanism in the future. Again, the price of carbon credits is far higher than the cost of cutting N₂O. This will allow industrial producers of N₂O to reinvest profits, expand their operations and so ultimately expand the quantities of greenhouse gases they produce.⁵¹

In Sri Lanka, carbon credits paid for a rural solar electrification programme. In theory, the solar panels replaced lamps powered by kerosene, reducing CO₂ emissions. However, communities which gained electricity for the first time used it for activities which they could not do before, such as watching television, and so did not replace the kerosene.⁵²

It can be expected that carbon credit projects which provide local electricity generating capacity to poor communities will often not reduce emissions. Naturally, where electricity is provided for the first time, it is likely to increase energy use, and so fail to provide cuts in carbon emissions. This is not an argument against providing renewable energy to poor communities, which is of course valuable in its own right and helps a low-carbon

^j Hydrofluorocarbons (HFCs) are potent greenhouse gases. HFC-23 is a kind of HFC, one tonne of which is equivalent to 11,700 tonnes of CO₂ emissions in terms of their contribution to climate change. Overall, HFC emissions are low, so make up a small percentage of the world's contribution to climate change.

ⁱⁱ Nitrous oxide is a potent greenhouse gas. One tonne of nitrous oxide emissions is equivalent to 310 tonnes of CO₂ emissions in terms of their contribution to climate change. Overall, nitrous oxide's total contribution to climate change is a lot lower than CO₂ but higher than HFCs.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

development process. However, it does not necessarily follow that CO₂ emissions will fall as a result.

A report by the UK Energy Research Centre in 2007 found that emissions savings from energy efficiency measures are lower than claimed by project planners. Because energy efficiency measures save money, the money saved can be spent on extra things. This higher consumption creates emissions elsewhere.⁵³ Professor Jim Skea, a member of the UK Committee on Climate Change, used the example of buying a more fuel efficient car:

"It should mean that I use less petrol. But because I am using less petrol, my running costs are less. In the end, I may drive further because driving is cheaper and that will offset some of the energy savings. The energy consumption per mile may be less, but I am driving more miles."⁵⁴

Carbon credits have a similar effect, even when not spent on energy efficiency projects. Because they give money to the company or community supposedly reducing emissions, that company or community has more money available to consume or invest in producing more, as well as money saved from any improvement in energy efficiency. This consumption or investment is very likely to involve the use of more fossil fuels, causing emissions to increase.

Real time emission cuts

Millions of people around the world are already experiencing negative impacts from climate change. The IPCC reported in 2007 that average global temperature has increased by 0.76°C between 1850-1899 and 2001-2005.⁵⁵ The World Health Organisation has estimated that 150,000 people are already dying every year from illnesses attributed to climate change. The IPCC went on to predict that due to past emissions, over the next couple of decades we are likely to see:

- Crop productivity declining in tropical areas with temperature increases of 1-2°C;
- In Africa, by 2020, between 75 and 250 million more people exposed to increased water stress;
- In some countries in Africa, yields from rain-fed agriculture could be reduced by up to 50 per cent by 2020.⁵⁶

Greenhouse gas emissions have a warming effect for as long as they cause there to be a higher concentration of greenhouse gases in the atmosphere. As the IPCC has highlighted, average global temperatures will continue to increase regardless of current emissions, for the next couple of decades.

The current challenge the world faces is to cut emissions enough over the next few decades to prevent catastrophic impacts from climate change in 20-30 years time and beyond. The IPCC went on to report that if the world does not act to mitigate greenhouse gas emissions, we could see temperature increases of 3.2 to 6.1°C over the course of this century.⁵⁷ Such increases could mean:

- In Asia, an additional 130 million people at risk of hunger by 2050 and 270 million by 2080;
- More than 100 million people at risk of water shortages in Latin America by the 2080s;

- In Africa, an additional 350-600 million people suffering from water shortages by 2050;
- Decreased water availability in Asia affecting more than a billion people by 2050;
- Crop revenues for farmers in Africa falling by 90 per cent by 2100.⁵⁸

Greenhouse gas emissions start contributing to future warming when they are released into the atmosphere. Therefore, an emission of one tonne of CO₂ today will have a greater effect on the temperature increase by 2050 than one tonne of CO₂ emitted in 2030.

Some carbon credits can be purchased for projects which claim to offset emissions over a certain timescale. For instance, it may be claimed that building a wind turbine reduces emissions equivalent to 30 years worth of emissions from electricity which would have otherwise been generated by fossil fuels. But when buying a credit from such a project, the emissions which it is claimed will be offset is all happening in one year.

Table 11. Example of effect of emissions at different times

	Effect on temperature in 2050 (ratio)	Effect on temperature in 2100 (ratio)
30 tonnes of CO ₂ emitted in 2010	30*40 years = 1,200	30*90 years = 2,700
Reduction of 30 tonnes of CO ₂ emissions between 2010 and 2040	(1*-40; 1*-39, 1*-38, etc) = -775	(1*-90; 1*-89, 1*-88 etc) = -2,325
Percentage of original emission offset	65	86

In the example above (Table 11), in 2010, 30 tonnes of CO₂ are emitted and contribute to warming for 40 years up to 2050 and 90 years to 2100.ⁱ It is claimed these emissions are offset by an action which reduces emissions by one tonne a year for 30 years; 30 tonnes in total. However, this action only counteracts 65 per cent of the warming effect of the original emissions by 2050, and 86 per cent by 2100.

This is not to say that the affect of emissions on temperatures after 2100 do not matter; of course they do. But for policy-makers seeking to prevent dangerous impacts from climate change in 2050 and 2100, emissions in current years have a lot more effect than future emissions.ⁱⁱ Therefore, even definite emission reductions in the future do not fully offset emissions today.

ⁱ In reality, some of the CO₂ emissions will be taken out of the atmosphere by the Earth's natural processes in the carbon cycle. This effect can be viewed as the same for both the original emission and the claimed reduction, and so it does not need to complicate the example. One reason the effect might not be the same is if the Earth is absorbing less CO₂ over time as the planet warms and the concentration of CO₂ in the atmosphere gets higher. There is some evidence this is already happening. Therefore, reducing emissions in the future is even *less* effective than making emission reductions today, because a greater percentage of future emissions will stay in the atmosphere.

ⁱⁱ This is also a reason why cuts in emissions have to be 'front-loaded'. Large reductions in emissions over the next few years will be a lot more effective in preventing dangerous impacts than emission reductions in the 2020s, 2030s and 2040s.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

Do not exacerbate social and environmental harm

*"It is unjust that the rich are allowed to emit whilst paying for more pollution for the poor."*⁵⁹

Mahesh Pandya, Paryavaran Mitra, Indian NGO

For the past 38 years, the World Development Movement has been highlighting how 'aid' money from Western governments and companies can have a detrimental impact on poor people around the world. There is no reason to assume that the carbon credit market should be any different. Carbon credits are produced on the basis of having a positive climate change impact, so it is natural to assume that projects are also socially responsible. Yet carbon credits can be sold by private companies which are normally unaccountable to the communities in which they seek to implement their projects.

The economic, social and environmental interests of a community have to be fully reflected in decisions on a project to reduce emissions. Unfortunately, there are already examples of carbon credit projects exacerbating social and environmental harm.

A project has been developed in Durban to extract methane from the Bisasar Road landfill site to use for electricity generation. This will reduce emissions of methane, a more potent greenhouse gas than the CO₂ released when methane is burnt. The generating of electricity from the methane gas rather than coal will also reduce emissions. The project has qualified to create carbon credits under the Clean Development Mechanism.

However, local campaigners have been calling for the landfill site to be shut down as it exposes local people to cancer-causing pollution, and infringes their right to clean air. Concentrations of cadmium, lead, hydrogen chloride, formaldehyde, benzene and trichloroethylene are all high in the area. Before getting Clean Development Mechanism funding, there was a good chance the landfill site would be closed down. However, the project has provided finance to enable the landfill site to keep operating.⁶⁰

The Indian state of Gujarat is one of the most industrialised states in India. Between 2006 and February 2008, 19 projects in Gujarat qualified to receive carbon credits under the Clean Development Mechanism. Of these, 13 (68 per cent) are to reduce HFC-23 emissions from factories (see above on HFC-23 projects). In total, the 19 projects are claimed to have reduced emissions by 12.5 million tonnes of CO₂eq.⁶¹

The Gujarati NGO Paryavaran Mitra says that some of the industries funded by CDM produce toxic or hazardous local pollution. The finance from CDM allows these industries to expand their operations, producing more local pollution, without any regulation of the impacts. Paryavaran Mitra go on to say that because CDM projects are providing money for Gujarat, there is no incentive for the State government to regulate the projects: "CDM projects are implemented haphazardly in India. The Ministry of Environment and Forests is in a promotional role, not a scrutiny role. Lots of foreign exchange in the name of CDM comes to India but it goes to industry's pocket. Local poor people whose livelihood is changed are neither aware nor benefit from the project implementation. Due to this, sometimes pollution does not come under control and the purpose of CDM projects is not served."⁶²

7. What the UK government should do

The UK government has to get real about the UK's contribution to climate change, in order to devise the most effective policies for reducing the UK's emissions. If aviation emissions remain invisible, they will continue to grow even if other sectors of the economy are set on a reduction path. Similarly, using carbon credits to meet reduction targets rather than reducing emissions will delay the switch to a low carbon economy which is needed to set a global example and develop the technology and ideas which are needed around the world.

The current climate change bill allows for the UK's contribution to climate change to be, if anything, higher in 2020 and 2050 than it is today. The climate change bill is not yet a piece of legislation which could set the UK on course to becoming a low carbon economy. Neither does it set an example to the world on how we can still prevent the worst effects of climate change. But it could be.

The UK government has to:

- include international aviation emissions within the targets in the climate change bill, and
- ensure that the UK becomes a low-carbon economy, rather than meeting emissions reduction targets through buying carbon credits from developing countries, and
- fund effective clean energy in developing countries which is *additional* to emission reductions in the UK, not *instead* of UK emission reductions.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

Appendix

Table 12. UK stated and actual contribution to climate change.

Years 1990-2006 are based on UK government figures. Years 2007-2050 are predictions based on the climate bill and Tyndall Centre predictions for growth in aviation. All figures are million tonnes of CO₂e

Year	UK stated contribution to climate change	Aviation and shipping ignored by the government	Emissions which the government claims have been offset by carbon credits	UK contribution to climate change
1990	770.8	48	0	818.8
1991	777.3	47.3	0	824.6
1992	752.9	51.5	0	804.4
1993	732.1	54.2	0	786.3
1994	719.7	55.5	0	775.2
1995	709	59.2	0	768.2
1996	729.5	62.7	0	792.2
1997	705.6	67.3	0	772.9
1998	700.9	74.4	0	775.3
1999	669.5	77.7	0	747.2
2000	671.4	84.2	0	755.6
2001	674.4	83.2	0	757.6
2002	653.8	80.8	0	734.6
2003	659.5	82.6	0	742.1
2004	657.9	90.7	0	748.6
2005	628.4	97	27.1	752.5
2006	618.5	99.3	33.8	751.6
2007	612.6	104.1	36.3	752.9
2008	606.8	107.3	39.4	753.6
2009	601.1	110.7	42.5	754.4
2010	595.3	114.2	45.7	755.2
2011	589.6	118	48.8	756.4
2012	583.8	121.9	51.9	757.7
2013	578.1	126	55.1	759.1
2014	572.3	130.2	58.2	760.7
2015	566.6	134.5	61.3	762.4
2016	560.8	139.1	64.5	764.3
2017	555.1	143.7	67.6	766.4
2018	549.3	148.6	70.7	768.6
2019	543.6	153.5	73.9	771
2020	537.8	160.7	77	775.5
2021	531.1	163.9	80.4	775.4
2022	524.4	167.3	83.7	775.3
2023	517.7	170.6	87.1	775.4
2024	510.9	174.1	90.4	775.5
2025	504.2	177.6	93.8	775.6
2026	497.5	181.2	97.1	775.9
2027	490.8	184.9	100.5	776.2
2028	484.1	188.6	103.9	776.6
2029	477.4	192.5	107.2	777.1

2030	470.7	196.5	110.6	777.7
2031	464	200.5	113.9	778.4
2032	457.2	204.6	117.3	779.1
2033	450.5	208.8	120.6	779.9
2034	443.8	213.1	124	780.9
2035	437.1	217.4	127.4	781.9
2036	430.4	221.9	130.7	783
2037	423.7	226.4	134.1	784.1
2038	417	231	137.4	785.4
2039	410.2	235.8	140.8	786.8
2040	403.5	240.3	144.1	788
2041	396.8	245.5	147.5	789.8
2042	390.1	250.7	150.8	791.7
2043	383.4	256.1	154.2	793.7
2044	376.7	261.6	157.6	795.9
2045	370	267.2	160.9	798.1
2046	363.3	273	164.3	800.5
2047	356.5	279	167.6	803
2048	349.8	284.9	171	805.7
2049	343.1	291	174.3	808.5
2050	336.4	294.9	177.7	809

Table 13. Growth rate of UK CO₂ emissions from aviation 1991 - 2006⁶³

Year	Growth rate of UK CO ₂ emissions from aviation (percentage change year-on-year)
1991	-1.2
1992	+9.6
1993	+5.9
1994	+3.7
1995	+6.4
1996	+5.5
1997	+6.7
1998	+10.6
1999	+8.9
2000	+10.3
2001	-2.1
2002	-1.7
2003	+2.7
2004	+9.4
2005	+7.4
2006	+1.5

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

Table 14. Calculation of UK emissions by sector in 2006⁶⁴

Emissions source	CO ₂	CH ₄	N ₂ O	Other (HFCs etc)	Non-CO ₂ emissions from aviation	Total
Public electricity and heat	183.7	0	1.1	0	0	184.8
Civil aviation ⁱ	37.9	0	0	0	56.9	94.8
Manufacturing and construction	82.3	0.5	1.5	0	0	84.3
Residential	79.7	0.5	0	0	0	80.2
Passenger cars	68.7	0	4.6	0	0	73.3
Other road transport	51.6	0	0.8	0	0	52.4
Agriculture	4.3	18.7	25.7	0	0	48.7
Energy production	36.9	8.8	0.4	0	0	46.1
Commercial and institutional buildings	21.7	0	0	0	0	21.7
Waste treatment	0.4	20.1	1.1	0	0	21.6
Industrial processes	14	0	2.3	0	0	16.3
Civil shipping ⁱⁱ	12.3	0	0	0	0	12.3
Military aviation and shipping	2.7	0	0	0	0	2.7
Railways ⁱⁱⁱ	2.2	0	0.4	0	0	2.6
Other	0.5	0.5	0.4	10.4	0	11.8
Land use change	-2.0	0	0	0	0	-2.0
Total	596.9	49.1	38.3	10.4	56.9	751.6

Table 15. Calculation of 2050 emissions by sector

A 57 per cent reduction in domestic CO₂ emissions on 2006 levels is needed to reduce domestic CO₂ emissions by 60 per cent on 1990 levels

Emissions source	CO ₂	CH ₄	N ₂ O	Other (HFCs etc)	Non-CO ₂ emissions from aviation	Total
Public electricity and heat	79	0	1.1			80.1
Civil aviation	118.4	0	0		177.6	296
Manufacturing and construction	35.4	0.5	1.5			37.4
Residential	34.3	0.5	0			34.8
Passenger cars	29.5	0	4.6			34.1
Other road transport	22.2	0	0.8			23
Agriculture	1.8	18.7	25.7			46.2
Energy production	15.9	8.8	0.4			25.1
Commercial and institutional buildings	9.3	0	0			9.3
Waste treatment	0.2	20.1	1.1			21.4
Industrial processes	6	0	2.3			8.3
Civil shipping	8.6	0	0			8.6
Military aviation and shipping	1.2	0	0			1.2
Railways	0.9	0	0.4			1.3
Other	0.2	0.5	0.4	10.4		11.5
Land use change	-2.0					-2.0
Total	360.9	49.1	38.3	10.4	177.6	636.3

ⁱ Domestic and international.

ⁱⁱ Domestic and international.

ⁱⁱⁱ Only diesel – emissions from electric trains are counted under public electricity.

References

- ¹ According to the US Energy Information Administration, Sweden emitted 58.8 million tonnes of CO₂ in 2006. US Energy Information Administration (2008). Carbon emissions by country in 2006. <http://www.eia.doe.gov/environment.html>
- ² UNDP. (2007). Human Development Report 2007/2008. Fighting climate change: Human solidarity in a divided world. UNDP. New York.
- ³ IPCC. (2007). *Climate Change 2007: Climate change impacts, adaptation and vulnerability*. Summary for Policymakers. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. 06/04/07.
- ⁴ IPCC. (2007). *Climate Change 2007: Climate change impacts, adaptation and vulnerability*. Summary for Policymakers. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. 06/04/07.
- ⁵ See Hardstaff, P. and Jones, T. (2007). *Blame it on China? The international politics of climate change*. World Development Movement. November 2007.
- ⁶ Calculated from Drax Power Limited. (2005). *Environmental performance review 2004*. And from US Energy Information Administration (2006). Carbon emissions by country in 2004. <http://www.eia.doe.gov/environment.html>
- ⁷ Defra. (2007). Draft Climate Change Bill 2007. Defra London. March 2007.
- ⁸ Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ⁹ Penner, J.E., Lister, D.H., Griggs, D.J., Dokken, D.J. and McFarland, M. (Eds.) (1999). Aviation and the global atmosphere. A Special Report of IPCC Working Groups I and III in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone Layer.
- ¹⁰ HM Treasury. (2006). 2006 Pre-Budget Report: Investing in Britain's potential – Building our long term future. HM Treasury. London. 06/12/06.
- ¹¹ DfT. (2006). Air Transport White Paper Progress Report 2006. Department for Transport. London. December 2006.
- ¹² National Statistics. (2007). Statistical release: 2005 UK climate change sustainable development indicator and greenhouse gas emissions final figures. Defra. London. 31/01/07.
- ¹³ Calculated from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ¹⁴ Calculated from National Statistics. (2007). Statistical release: 2006 UK climate change sustainable development indicator and greenhouse gas emissions final figures. Defra. London. 31/01/08. And from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ¹⁵ Miliband, D. (2006). Interview on the Today programme. BBC Radio 4. 27/09/06.
- ¹⁶ Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ¹⁷ Calculated from National Statistics. (2008). Statistical release: 2006 UK climate change sustainable development indicator and greenhouse gas emissions final figures. Defra. London. 31/01/08. And from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ¹⁸ Calculated from National Statistics. (2008). Statistical release: 2008 UK climate change sustainable development indicator and greenhouse gas emissions final figures. Defra. London. 31/01/08. And from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ¹⁹ King, D. (2007). Oral evidence to the House of Lords and House of Commons Joint Committee on the Draft Climate Change Bill. HC 542-II and HL Paper 170-II. 22/08/07
- ²⁰ Defra. (2007). Draft Climate Change Bill 2007. Defra London. March 2007.
- ²¹ DfT. (2003). *Aviation White Paper: The future of air transport*. Department for Transport. London. December 2003.
- ²² Bows, A. (2006). Produced in Cairns, S. and Newson, C. (2006). *Predict and decide: Aviation, climate change and UK policy*. Environmental Change Institute. University of Oxford.
- ²³ Owen, B and Lee, D. (2006). Produced in Cairns, S. and Newson, C. (2006). *Predict and decide: Aviation, climate change and UK policy*. Environmental Change Institute. University of Oxford.
- ²⁴ DfT. (2004). *The future of Transport: A network for 2030*. Department for Transport. London. July 2004.
- ²⁵ Benn, H. (2008). Letter to MPs about constituent concerns about the climate change bill. November 2007.
- ²⁶ Department for Transport. (2007). Consultation on the emissions cost assessment. Department for Transport. London. August 2007.
- ²⁷ Kelly, R. (2008). Letter to The Woodland Trust. 11/01/08.
- ²⁸ Evidence by Department for Transport to Environmental Audit Select Committee. 24 February 2004.
- ²⁹ University of Cambridge Institute for Aviation and the Environment <http://www.iae.damtp.cam.ac.uk/> Viewed on 14/11/07.
- ³⁰ Calculated by WDM based on UNFCCC. (2005). *Compilation of data on emissions from international aviation*. Paper prepared for the 22nd session of the subsidiary body for scientific and technological advice of the UNFCCC. Bonn. 19-27 May 2005.

Mind the gap

Why the UK government's climate change bill will not reduce UK greenhouse gas emissions

- ³¹ Calculated from National Statistics. (2008). Statistical release: 2006 UK climate change sustainable development indicator and greenhouse gas emissions final figures. Defra. London. 31/01/08. And from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ³² EAC. (2006). Reducing carbon emissions from transport. Ninth report of session 2005–06. HC 981-I. 07/08/06.
- ³³ Kelly, R. (2008). Letter to The Woodland Trust. 11/01/08.
- ³⁴ Calculated by WDM from ONS. (2006). Individual incomes in the UK. Office of National Statistics, Newport. And CAA. (2006). 2005 Air Passenger Survey. Civil Aviation Authority.
- ³⁵ CAA. (2006). *Air Passenger Survey 2006*. Civil Aviation Authority.
- ³⁶ Calculated from IMF. (2008). IMF direction of trade statistics database. February 2008.
- ³⁷ Benn, H. (2008). Letter to MPs about constituent concerns about the climate change bill. November 2007.
- ³⁸ http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php
- ³⁹ Defra. (2008). UK emissions figures down. Defra. London. 31/01/08. <http://www.defra.gov.uk/news/latest/2008/climate-b-0131.htm>
- ⁴⁰ EAC. (2007). *The EU Emissions Trading Scheme: Lessons for the future*. Environmental Audit Committee, Second Report of session 2006–07.
- ⁴¹ Joint Committee of Parliament on the draft climate change bill. (2007). Final report: Volume I. August 2007.
- ⁴² Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London.
- ⁴³ Benn, H. (2008). Letter to MPs about constituent concerns about the climate change bill. November 2007.
- ⁴⁴ Turner, A. (2008). Interview on Radio 4 Today programme. 10/03/08.
- ⁴⁵ The data set on historical emissions was taken from the World Resources Institute. See: <http://cait.wri.org/cait.php?page=cumul&mode=view>. The data set on current emissions was taken from the US Energy Information Administration. See: <http://www.eia.doe.gov/environment.html>
- ⁴⁶ Benn, H. (2008). Letter to MPs about constituent concerns about the climate change bill. November 2007.
- ⁴⁷ Harvey, F Bryant, C and Aglionby, J. (2007). Producers, traders reap credits windfall. *Financial Times*. London. 26/04/07.
- ⁴⁸ Smith, K. (2007). *Pollute and profit: So when will Brussels admit that its emissions trading scheme is not only not working, but has proved a disaster?*
- ⁴⁹ Smith, K. (2007). *Pollute and profit: So when will Brussels admit that its emissions trading scheme is not only not working, but has proved a disaster?*
- ⁵⁰ Joint Committee of Parliament on the draft climate change bill. (2007). Final report: Volume I. August 2007.
- ⁵¹ Harvey, F Bryant, C and Aglionby, J. (2007). Producers, traders reap credits windfall. *Financial Times*. London. 26/04/07.
- ⁵² Lohmann, L. (2006). *Carbon trading: A critical conversation on climate change, privatisation and power*. Development Dialogue No. 38. Dag Hammarskjöld Centre. September 2006.
- ⁵³ Sorrell, S. (2007). *The rebound effect: An assessment of the evidence for economy-wide energy savings from improved energy efficiency*. A report produced by the Sussex Energy Group for the Technology and Policy Assessment function of the UK Energy Research Centre. October 2007.
- ⁵⁴ BBC News On-line. (2007). UK energy savings miscalculated. *BBC News On-Line*. 01/11/07.
- ⁵⁵ IPCC. (2007). *Climate Change 2007: The Physical Science Basis*. Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. 02/02/07.
- ⁵⁶ IPCC. (2007). *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for policymakers*. IPCC.
- ⁵⁷ IPCC. (2007). *Climate Change 2007: Mitigation*. Summary for Policymakers. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. 04/05/07.
- ⁵⁸ IPCC. (2007). *Climate change 2007: Working group II report: Impacts, adaptation and vulnerability*.
- ⁵⁹ Jones, T. (2007). Climate march blog. 17/07/07. <http://climatechangemarch.blogspot.com/2007/07/corrupt-emissions.html>
- ⁶⁰ Lohmann, L. (2006). *Carbon trading: A critical conversation on climate change, privatisation and power*. Development Dialogue No. 38. Dag Hammarskjöld Centre. September 2006.
- ⁶¹ Calculated from UNFCCC. (2008). <https://cdm.unfccc.int> Viewed on 29/02/08.
- ⁶² Pandya, M. (2007). Presentation on environmental issues. <http://paryavaranmitra.org.in/Observation.htm>
- ⁶³ Calculated from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
- ⁶⁴ Calculated from National Statistics. (2008). Statistical release: 2008 UK climate change sustainable development indicator and greenhouse gas emissions final figures. Defra. London. 31/01/08. And from Defra. (2008). Estimated emissions of carbon dioxide by IPCC source category, type of fuel and end user: 1970 – 2006. Defra. London. January 2008.
-