



# **Transport Committee inquiry into the future of aviation**

**Submission by the World Development Movement**

**February 2009**

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### **1. Introduction**

1. The 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 15,000 individuals and 70 local groups.
  
2. We welcome the Transport Committee's decision to hold an inquiry into the future of aviation. This submission focuses on the fourth question set by this inquiry: "What costs does aviation impose on society and the environment? What are the implications of climate change policy—in particular the Climate Change Act 2008—for the aviation industry and infrastructure?" We focus our submission on the following points:
  - The UK has to greatly reduce its emissions
  - There is currently slow progress in doing so
  - Aviation makes-up 10 per cent of the UK's contribution to climate change
  - Under Department for Transport projections for growth in aviation emissions it will be extremely difficult, and probably impossible, for the UK to meet its climate change targets set under the Climate Change Act 2008
  - Expansion of aviation requires very large reductions in emissions very soon from all other sectors, for which there are currently no plans or policies
  - The Department for Transport predictions of efficiency improvements are very optimistic compared to the average over 1990-2007
  - Only half the UK population fly in one year; flying is an activity dominated by the rich
  - There is no social justice reason why aviation should be treated as a special case
  - Including aviation in the EU Emissions Trading Scheme (ETS) will do little to reduce emissions either in the aviation sector or other sectors
  - Including aviation in the EU ETS will not ensure the UK meets its legally binding targets to reduce emissions by 2020 under the Climate Change Act 2008
  - The global warming costs of aviation will be felt primarily through the loss of lives and livelihoods of poor people across the world, especially in developing countries
  - Equating the global warming costs of aviation solely with economic costs of climate change is unjust

## 2. The climate change context

3. Climate change is a threat to the current and future well-being of billions of people around the world. The European Union and UK government have a target to keep the increase in global temperatures to a maximum of 2°C above pre-industrial levels. The Intergovernmental Panel on Climate Change (IPCC) reported in 2007 that to keep the increase in global temperatures between 2°C and 2.4°C above pre-industrial levels requires global emissions to peak between now and 2015 at the latest, and then fall by between 50 and 85 per cent on 2000 levels by 2050.<sup>1</sup> For the UK to play its part in reducing global emissions by 50-85 per cent by 2050 requires UK emissions to fall by 80-95 per cent by 2050 (see Table 1 below).

**Table 1: Global and UK required emissions reductions by 2050<sup>2</sup>**

	<b>Global emissions of CO<sub>2</sub> from the burning of fossil fuels</b>	<b>UK emissions of CO<sub>2</sub> from the burning of fossil fuels</b>
2000 total emissions	23.8 billion tonnes	555 million tonnes
2000 per person emissions	3.9 tonnes	9.3 tonnes
2050 total emissions	3.6 - 11.9 billion tonnes	36 – 108 million tonnes
2050 per person emissions	0.6 – 1.8 tonnes	0.6 – 1.8 tonnes

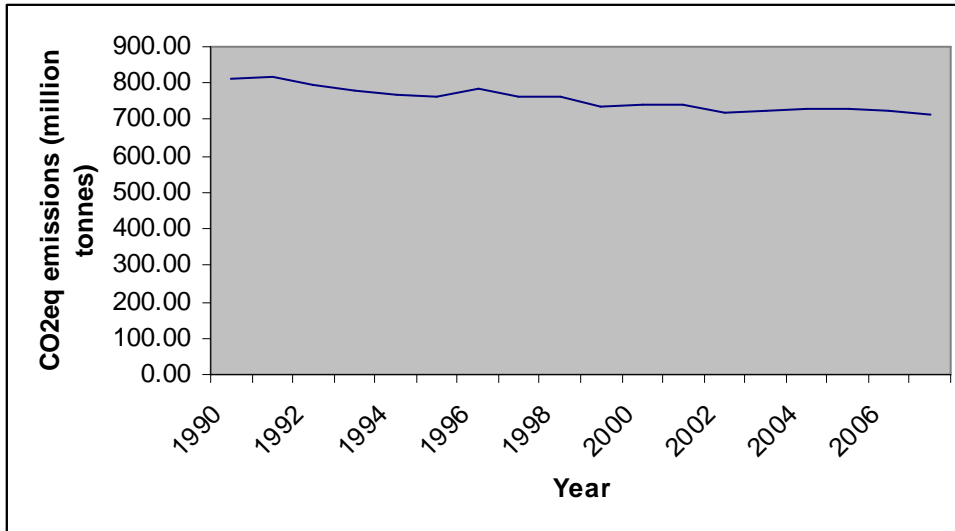
4. For global emissions to peak by 2015 at the latest rich countries like the UK must make sizeable reductions in emissions straightaway. To reduce UK emissions by 80 per cent by 2050 requires cuts of around 4 per cent every year, beginning in 2009. This means UK emissions need to fall by 40 per cent by 2020 and 60 per cent by 2030.
5. In 2008 the Climate Change Act was passed by Parliament setting a legally binding target to reduce UK greenhouse gas emissions by 80 per cent on 1990 levels by 2050.<sup>3</sup> The Act also makes provision for five-yearly carbon budgets to be created, starting with the period 2008-2012. The Act further made provision for a Committee on Climate Change to be created to provide advice for the government.
6. In December 2008 the Committee on Climate Change advised that a target should be set for reducing greenhouse gas emissions by 42 per cent on 1990 levels by 2020 if there is an international agreement on limiting emissions up-to 2020, or a target of a 34 per cent reduction on 1990 levels in the absence of such an agreement. It is UK government policy to secure an international agreement on limiting emissions up-to 2020, and so current policy decisions should be made on the basis that the Committee on Climate Change is advising that UK greenhouse gas emissions should be reduced by 42 per cent on 1990 levels by 2020.<sup>4</sup>
7. The Climate Change Act also requires the Committee on Climate Change to advise the government on how to treat emissions from the UK's share of international aviation and shipping. In December 2008 the Committee on Climate Change reported, saying: "Whilst aviation and shipping emissions are today both relatively small as a percent of total global emissions they are likely, if unconstrained, to grow to much larger shares. It is therefore essential either to curtail emissions growth significantly or to set more stringent targets for all other sectors which compensate for the difficulty of achieving cuts in these sectors."<sup>5</sup>

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8. The UK is actually reducing emissions very slowly, if at all. In 2006, the UK's total contribution to climate change was 8 per cent lower than in 1990.

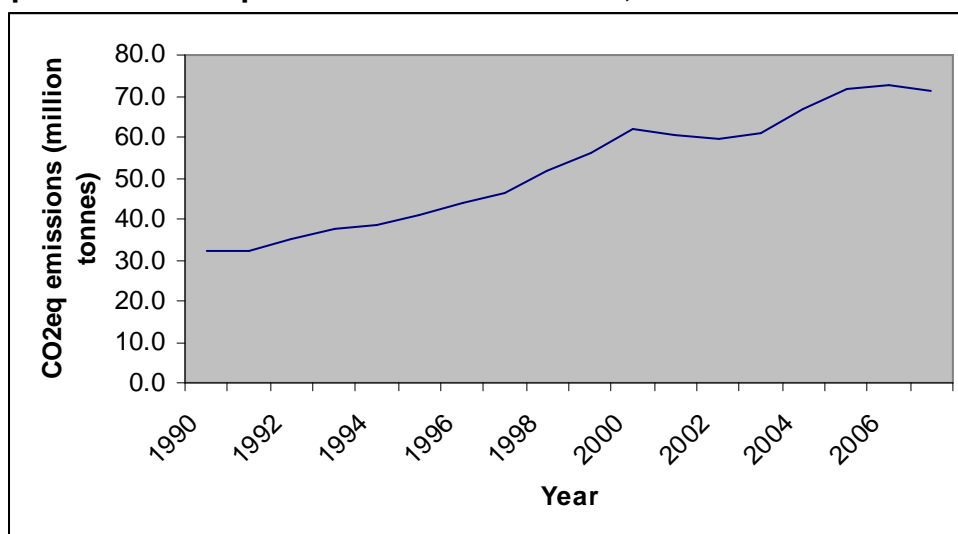
**Graph 1. UK CO<sub>2</sub>eq emissions 1990-2007 (including international aviation and shipping, and non-CO<sub>2</sub> impacts of aviation)<sup>6</sup>**



9. The Department for Energy and Climate Change (DECC) report that in 2007, the UK's total CO<sub>2</sub>eq\* emissions were 636.6 million tonnes.<sup>7</sup> This does not include CO<sub>2</sub> emissions from the UK's share of international aviation and shipping, and non-CO<sub>2</sub> emissions from international and domestic aviation. The Department for Transport estimates that UK aviation causes 1.9 times more warming than from CO<sub>2</sub> alone.<sup>8</sup> Including these emissions therefore raises total UK emissions to 712.7 million tonnes of CO<sub>2</sub>eq. Of this, 10 per cent of the UK's current emissions are from aviation.

10. The contribution of UK aviation to climate change has more than doubled since 1990 (see Graph 2 below).

**Graph 2: UK CO<sub>2</sub>eq emissions from aviation, 1990-2007<sup>9</sup>**



\* CO<sub>2</sub>eq refers to the CO<sub>2</sub> equivalent impact of emissions, whether from CO<sub>2</sub> itself or other greenhouse gases.

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11. The current climate change context is that:

- The UK has to greatly reduce its emissions
- There is currently slow progress in doing so
- Aviation makes-up 10 per cent of the UK's contribution to climate change

### 3. Growth in UK aviation emissions

12. Whilst aviation emissions fell in 2007, and are likely to have fallen further in 2008 and 2009, the Department for Transport predicts that under current policies aviation and aviation emissions will continue to grow in the medium- and long-term. The most recent estimate of UK aviation emissions is from the Department for Transport in January 2009 (see Table 2 below).

**Table 2. Department for Transport prediction of emissions from UK aviation<sup>10</sup>**

	Low case (CO <sub>2</sub> )	Central case (CO <sub>2</sub> )	High case (CO <sub>2</sub> )	Central case (CO <sub>2</sub> eq using multiplier of 1.9)	Central case (CO <sub>2</sub> eq using multiplier of 4)
2005	37.5	37.5	37.5	71.3	150
2010	39.4	41.0	41.7	77.9	164
2020	45.1	50.3	52.9	95.6	201.2
2030	51.8	58.4	61.6	111	233.6
2040	53.8	61.1	65.0	116.1	244.4
2050	53.0	59.9	65.0	113.8	239.6

13. As well as CO<sub>2</sub>, emissions of nitric oxide, nitrogen dioxide and water vapour by aviation at altitude also contribute to global warming. 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 CO<sub>2</sub> emissions alone. It went on to predict that between 1992 and 2050, the warming caused by aviation would be 2 to 4 times greater than aviation's CO<sub>2</sub> emissions alone.<sup>11</sup>

14. The Department for Transport states that: "In order to recognise the varying scientific views on radiative forcing and to demonstrate the potential magnitude of significance of these other effects, in line with the most recent evidence we apply a multiplier value of 1.9 to the figure for carbon dioxide emitted as the central case, with sensitivity tests to define a range using a multiplier of 1 and 4."<sup>12</sup> In Table 2 above we have added columns using these different multipliers.

**Table 3. Aviation emissions growth and UK targets for reducing emissions**

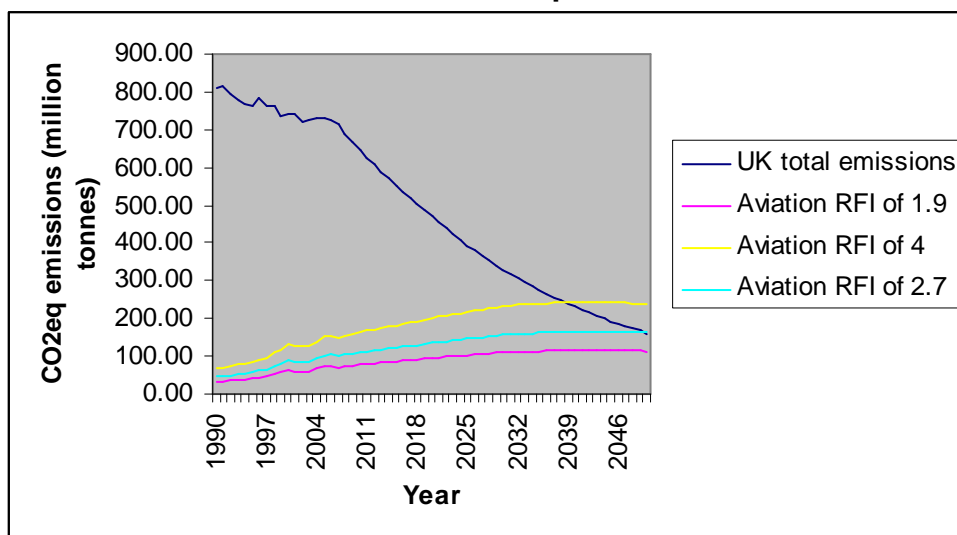
	UK greenhouse gas emissions required to meet 80% target (1990 and 2005 actual)	Aviation (central case, just CO <sub>2</sub> )	Aviation (central case, CO <sub>2</sub> eq with radiative forcing of 1.9)	Aviation (central case, CO <sub>2</sub> eq with radiative forcing of 4)
1990	811	17.1	32.5	68.4
2005	728	37.8	71.8	151.2
2010	619	41.0	77.9	164
2020	470	50.3	95.6	201.2
2030	319	58.4	111	233.6
2040	225	61.1	116.1	244.4
2050	162	59.9	113.8	239.6

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15. Table 3 above shows that even using the Department for Transport's central case for aviation growth and multiplier for the non-CO<sub>2</sub> impacts of aviation, aviation will make up 70 per cent of the UK's contribution to climate change by 2050. For the UK to meet its targets for reducing emissions, whilst allowing for this level of aviation growth, then by 2020 other sectors will have to reduce their emissions by 54 per cent on 1990 levels and by 2050 by 94 per cent on 1990 levels. Neither the UK government nor the Committee on Climate Change has set out any scenario under which emissions from all other sectors can be reduced so drastically. And it is unclear why aviation should be allowed to expand its emissions if all other sectors have to drastically reduce theirs.
16. However, if the multiplier were higher than 1.9 – as the Department for Transport accepts is possible – aviation could prevent the UK meeting its reduction targets, even if all other sectors of the economy use no fossil fuels or create no greenhouse gases at all.

**Graph 3. UK required emissions up to 2050, and projected UK aviation emissions at different levels of multiplier<sup>13</sup>**



17. The January 2009 predictions of aviation emissions growth by the Department for Transport only compare forecasts for CO<sub>2</sub>, rather than CO<sub>2</sub>eq, with the UK's targets for greenhouse gas emissions reductions by 2050. Given that the UK's targets are expressed in greenhouse gas emissions, and given that the Department for Transport accepts in the same paper that a multiplier should be applied to aviation CO<sub>2</sub> emissions to account for non-CO<sub>2</sub> impacts, it is not clear why they have not done the comparison above.
18. In January 2009 the UK government announced a new target; UK aviation emissions would be below 2005 levels in 2050.<sup>14</sup> However, this target was not reflected in the Department for Transport's predictions of aviation emissions up-to 2050. Presumably this means that under current policies the government predict that the new target for 2050 will not be met, and therefore additional policies are needed to ensure aviation emissions are below 2005 levels by 2050.

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19. One key assumption lying behind the Department for Transport projections of CO<sub>2</sub> emissions is that average fuel efficiency will improve by an average of 1.1 per cent a year from 2005 to 2030, and by 0.75 per cent between 2030 and 2050. This translates into an annual reduction in emissions per passenger of around 0.8 per cent. Therefore, growth in emissions will be at a lower rate than growth in passengers; and from 2030 onwards passenger growth will be constrained and aviation emissions will consequently fall.
20. However, over the period 1990-2007, average emissions per passenger have only fallen by 0.4 per cent a year (see Table 4 below). The Department for Transport projections of aviation emissions growth rely on a doubling in the percentage increase in efficiency over what has happened over the last two decades. The Department for Transport predictions of aviation emissions and efficiency from 2005 to 2050 are very optimistic. In reality, the predicted level of passenger growth could actually equal far higher emissions. If annual percentage efficiency improvements remain the same as 1990-2007, then in 2050 aviation emissions will be an additional 20 per cent higher than predicted by the Department for Transport, even with the same numbers of passengers.

**Table 4. UK aviation emissions per passenger**<sup>15</sup>

	Emissions (million tonnes of CO <sub>2</sub> )	Passengers (millions)	Emissions to passenger ratio	Emissions to passenger ratio average for three years	Annual reduction in emissions / passenger
1990	17.1	102	0.167	0.172	N/A
1991	16.8	96	0.176		
1992	18.5	106	0.174		
1993	19.7	112	0.176	0.170	- 0.4
1994	20.4	122	0.167		
1995	21.7	129	0.168		
1996	23	136	0.169	0.169	- 0.2
1997	24.5	147	0.167		
1998	27.2	159	0.171		
1999	29.6	168	0.176	0.178	+ 1.8
2000	32.5	180	0.181		
2001	31.9	181	0.176		
2002	31.3	189	0.166	0.163	- 2.8
2003	32	200	0.160		
2004	35.1	216	0.163		
2005	37.8	228	0.166	0.161	-0.4
2006	38.3	235	0.163		
2007	37.4	241	0.155		
2010	41.0	258	0.159	0.159	-0.4
2020	50.3	350	0.144	0.144	-0.8
2030	58.4	427	0.137	0.137	-0.5
2040	61.1	490	0.125	0.125	-0.9
2050	59.9	525	0.114	0.114	-0.7

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21. In summary:

- Under Department for Transport projections for growth in aviation emissions it will be extremely difficult, and probably impossible, for the UK to meet its climate change targets set under the Climate Change Act 2008
- Expansion of aviation requires very large reductions in emissions very soon from all other sectors, for which there are currently no plans or policies
- The Department for Transport predictions of efficiency improvements are very optimistic compared to the average over 1990-2007

### 4. Social justice

22. Allowing aviation to expand is also socially unjust. The UK government is expecting every sector of the UK economy to reduce emissions, *except* for aviation. Yet no case has been presented for why aviation should be an exception. Half of the UK population do not fly in any one year (see Table 5 below).<sup>16</sup> In contrast, virtually 100 per cent of the UK population use electricity, home heating and road or public transport every year.

**Table 5: Proportion of UK population who have flown in the last year<sup>17</sup>**

	Proportion who have not flown in last year	Proportion who have taken one return journey	Proportion who have taken more than one return journey
Total UK population	49%	25%	26%
AB (upper middle class/middle class)	36%	27%	38%
C1 (lower middle class)	42%	26%	32%
C2 (skilled working class)	53%	25%	22%
DE (working class / no earnings)	68%	22%	10%

23. Aviation is an activity dominated by the rich. 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.<sup>18</sup> 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.<sup>19</sup>

24. In summary:

- Only half the UK population fly in one year; flying is an activity dominated by the rich
- There is no social justice reason why aviation should be treated as a special case

### 5. Aviation in the EU Emissions Trading Scheme

25. The UK government argues that expansion of aviation is partly justified because aviation's inclusion in the EU's Emissions Trading Scheme means that the sector will need to pay to reduce emissions in other sectors in Europe. The reasoning is that total UK emission reduction targets can still be met if aviation pays for extra emissions reductions in other sectors whilst continuing to grow. Including aviation in the European Union's Emissions Trading Scheme (ETS) is the mechanism for this

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to happen. In Table 6 we set out theoretically how this could work to meet the UK's target of reducing greenhouse gas emissions by 42 per cent by 2020 on 1990 levels.

**Table 6. Theoretical effect on UK emissions in 2020 of aviation being included in the EU Emissions Trading Scheme**

Year	Non-aviation emissions (CO <sub>2</sub> eq)	Aviation emissions (CO <sub>2</sub> eq, multiplier of 1.9)	Extra reductions aviation needs to buy from other sectors (CO <sub>2</sub> eq)	Total emissions (CO <sub>2</sub> eq)	Percentage reduction on 1990 levels (CO <sub>2</sub> eq)
1990	776.3	32.1	0	808.4	
2004/06	659.1	69.7	0	728.8	9.8%
2020	450.3 (42% reduction on 1990 levels)	95.6 <sup>20</sup>	77	468.9 <sup>21</sup>	42%

26. In this example, non-aviation sectors reduce their emissions by 42 per cent on 1990 levels by 2020. Aviation emissions grow in line with UK Department for Transport predictions. For the UK to still reduce total emissions by 42 per cent by 2020, aviation emissions would need to actually be reduced by 42 per cent on 1990 levels by 2020; taking aviation emissions down to 18.6 million tonnes of CO<sub>2</sub>eq.

Therefore, aviation needs to pay to reduce emissions by a further 77 million tonnes of CO<sub>2</sub>eq (95.6 – 18.6 = 77) on top of the cuts other sectors will already be making. Total UK emissions would be 468.9 million tonnes of CO<sub>2</sub>eq in 2020, a 42 per cent reduction on 1990 levels.

27. However, there are three reasons why the inclusion of aviation in the EU ETS will *not* lead to this reduction in emissions, and so government policy will not be met. We set these out in turn below.

### 5.1 Permits allocated based on emissions in 2004/06

28. From 2013, the aviation sector will be allocated permits to emit equivalent to 95 per cent of the sector's average emissions from 2004 to 2006.<sup>22</sup> For UK aviation this is 66.2 million tonnes of CO<sub>2</sub>eq. The growth in aviation emissions from 1990 to 2004/06 is not accounted for. Whilst aviation will have to pay for reductions in other sectors for emissions above 2004/06 levels, it will not have to do so for emissions growth before 2004/06. However, UK, EU and global targets for emission reductions work on a baseline of 1990. In the UK, aviation emissions were 32.1 million tonnes of CO<sub>2</sub>eq in 1990, compared to the annual average of 69.7 million tonnes of CO<sub>2</sub>eq for 2004 to 2006, a growth of 117 per cent.

29. Furthermore, aviation will be allocated the same level of permits every year; it will not have to reduce emissions. In contrast, every other sector in the EU ETS has been allocated permits based on emissions in 1990 minus a reduction target, and permits allocated or auctioned will continue to fall every year.

30. By 2020, aviation will only have to pay to reduce any emissions over 95 per cent of 2004/06 levels (66.2 million tonnes of CO<sub>2</sub>eq). Based on Department for Transport estimates of aviation emissions growth, aviation will emit 95.6 million tonnes of CO<sub>2</sub>eq by 2020, and so will need to purchase permits to emit 29.4 million tonnes of CO<sub>2</sub>eq, rather than 77 million tonnes as highlighted in the hypothetical example above. (see Table 7 below). Aviation does not have to pay for the growth in aviation emissions between 1990 and 2004/06 to be reduced elsewhere. Neither does

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aviation have to contribute to emission cuts below 1990 levels, unlike every other sector. The overall impact of this is that total UK emissions will be cut by 36 per cent rather than 42 per cent, even with every sector other than aviation cutting by 42 per cent.

**Table 7. Effect on UK emissions in 2020 of permits being allocated for aviation on 2004/06 emissions**

Year	Non-aviation emissions	Aviation emissions (CO <sub>2</sub> eq, multiplier of 1.9)	Extra reductions aviation needs to buy from other sectors	Total emissions	Percentage reduction on 1990 levels (CO <sub>2</sub> eq)
1990	776.3	32.1	0	808.4	
2004/06	659.1	69.7	0	728.8	9.8%
2020	450.3 (42% reduction on 1990 levels)	95.6 <sup>23</sup>	29.4	516.5	36.1%

### 5.2 Only CO<sub>2</sub> emissions from aviation will be included in the EU ETS

31. Only CO<sub>2</sub> from aviation will be included in the emissions trading scheme; non-CO<sub>2</sub> impacts will not. This means that rather than having to buy permits to cover the growth in all its emissions, the aviation sector will only need to buy permits to cover the growth in CO<sub>2</sub> emissions. This is 13.6 million tonnes of CO<sub>2</sub> between 2004/06 and 2020 rather than 25.9 million tonnes of CO<sub>2</sub>eq (see Table 8 below). The increase in non-CO<sub>2</sub> impacts of aviation will not be reduced elsewhere. Because the non-CO<sub>2</sub> impacts of aviation are not included, adding the effect of this to the loophole in section 5.1 shows that total UK emissions will be cut by 34 per cent rather than 42 per cent, even with every sector other than aviation cutting emissions by 42 per cent.

**Table 8. Effect on UK emissions in 2020 of permits being allocated for aviation on 2004/06 emissions, and only addressing CO<sub>2</sub> emissions**

Year	Non-aviation emissions	Aviation emissions (CO <sub>2</sub> eq, multiplier of 1.9)	Extra reductions aviation needs to buy from other sectors	Total emissions	Percentage reduction on 1990 levels (CO <sub>2</sub> eq)
1990	776.3	32.1	0	808.4	
2004/06	659.1	69.7	0	728.8	9.8%
2020	450.3 (42% reduction on 1990 levels)	95.6 <sup>24</sup>	13.6	532.3	34%

### 5.3 Use of credits from outside the EU

32. Airlines do not have to pay for equivalent emissions reductions “in other sectors” in Europe. Aviation will be free to trade within the main EU ETS, which means aviation can meet its emissions through buying permits from outside the EU generated by Clean Development Mechanism (CDM) projects.

33. Under the EU climate and energy package agreed in late-2008, 50 per cent of required emissions reductions in the ETS from 2013 on can be met through buying CDM credits rather than European permits. This means that up-to half of required

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emissions reductions can be met through projects outside the EU rather than cutting emissions within Europe.

34. The price for CDM offset credits is predicted to be low until 2020, and so therefore it is likely that EU industries in the ETS will use as many CDM credits as they can, rather than buy EU permits (see Table 9 below).

**Table 9. Committee on Climate Change predictions of CDM and ETS prices up-to 2020<sup>25</sup>**

Year	CDM offset credit price projections (central case) (€)	EU ETS allowance price projections (low reference case) (€)
2010	14	24
2015	12	30
2020	16	38

35. Buying credits from outside Europe assumes that climate change can be tackled by reducing emissions in developing countries *instead* of reducing emissions in the UK and Europe. In reality, cuts in developing countries have to be *in addition* to the cuts required of industrialised countries. Industrialised countries currently account for 54 per cent of global CO<sub>2</sub> emissions, whilst containing 20 per cent of the world's population. Developing countries account for 46 per cent of CO<sub>2</sub> emissions, and have 80 per cent of the world's population.<sup>26</sup>
36. To meet global emission reduction targets to prevent dangerous climate change industrialised countries like the UK have to reduce emissions by around 40 per cent by 2020 and more than 80 per cent by 2050. And some developing countries have to be assisted in halting the growth in emissions, and in the future reducing them. Such help has to be *in addition* to large cuts in emissions in rich countries, not *instead* of cuts in rich countries.
37. The Committee on Climate Change has said: "rich developed economies need to start demonstrating that a low-carbon economy is possible and compatible with economic prosperity, in order to gain developing country commitment to long-term emissions reductions, and need to start driving the technologies and energy efficiency improvements which will make a low-carbon economy possible. They can only do this by employing measures which drive down emissions in rich developed economies rather than relying solely on purchased credits."<sup>27</sup>
38. Furthermore, there is widespread evidence that CDM projects do not reduce emissions in developing countries. The Joint Committee Parliament on the Climate Change Bill said 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.*"<sup>28</sup>
39. The Committee on Climate Change has said: "there remain concerns as to whether offset credits can ever be as certain a form of emission reduction as domestic reductions. While the procedures for the approval and monitoring of CDM projects are being continually improved, any system of credits for reduction against a

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hypothetical business-as-usual scenario, is inherently less robust than a cap and trade system where reductions are required in the certifiable total of all emissions.”<sup>29</sup>

40. A report by International Rivers Network found that three out of four CDM projects were already up-and-running by the time they were approved to generate CDM credits, strongly suggesting that the projects would all have happened anyway.<sup>30</sup> A report by the US Government Accountability Office to Congress says the CDM’s “effects on emissions are uncertain ... available evidence suggests that some offset credits were awarded for projects that would have occurred even in the absence of the CDM”.<sup>31</sup>

41. Assuming that the aviation sector buys half of its extra permits from outside Europe,<sup>32</sup> this means that rather than needing to buy permits to emit 13.6 million tonnes of CO<sub>2</sub> from other sectors in Europe, aviation only has to buy 6.8 million tonnes (see Table 10 below).

**Table 10: The actual effect of including aviation in the emissions trading scheme**

Year	Non-aviation emissions	Aviation emissions (CO <sub>2</sub> eq, multiplier of 1.9)	Extra reductions aviation needs to buy from other sectors	Total emissions	Percentage reduction on 1990 levels (CO <sub>2</sub> eq)
1990	776.3	32.1	0	808.4	
2004/06	659.1	69.7	0	728.8	9.8%
2020	450.3 (42% reduction on 1990 levels)	95.6 <sup>33</sup>	6.8	539.1	33.3%

42. Even with:

- every other sector reducing emissions by 42 per cent on 1990 levels by 2020, and
- aviation being included in the ETS,

43. The impact of including UK aviation in the EU ETS will be to reduce emissions somewhere in Europe by 6.8 million tonnes of CO<sub>2</sub> a year by 2020. This is in contrast with projected growth in UK aviation emissions by the Department for Transport of 25.9 million tonnes of CO<sub>2</sub>eq between 2004/06 and 2020.

44. by 2020 the UK’s actual contribution to climate change will have only fallen by 33 per cent, from 808.4 million tonnes of CO<sub>2</sub>eq in 1990 to 539.1 million tonnes of CO<sub>2</sub>eq (see Table 11 above), rather than a policy target of 42 per cent. Including aviation in the EU ETS will not ensure the UK meets its legally binding targets to reduce emissions by 2020 under the Climate Change Act 2008. Therefore, additional policies are needed. If the UK government adopts a 2020 target lower than that recommended by the Committee on Climate Change, then the actual reduction in emissions will be even less.

45. In summary:

- Including aviation in the EU Emissions Trading Scheme (ETS) will do little to reduce emissions either in the aviation sector or other sectors
- Including aviation in the EU ETS will not ensure the UK meets its legally binding targets to reduce emissions by 2020 under the Climate Change Act 2008

## **6. Aviation paying its environmental costs**

46. The Committee has asked the question “What costs does aviation impose on society and the environment?” The Stern Report and UK government have both sought to answer this question through the concept of the ‘price of carbon’; the economic cost one unit of CO<sub>2</sub> or CO<sub>2</sub>eq has across the world through its global warming impact.

47. The government has a “shadow price for carbon” of £25 per tonne of CO<sub>2</sub>eq emissions in 2007, which it uses as a measure of ‘environmental cost’.<sup>34</sup> This cost of carbon is based on the world taking all the measures needed to prevent global temperatures increasing by more than 2°C on pre-industrial levels. However, neither the UK government nor other countries around the world are taking the measures needed to prevent global temperatures increasing by more than 2°C. The Stern Report said that the cost of carbon on the basis of current policies and the warming they will bring is US\$85 (£60) a tonne of CO<sub>2</sub>eq.<sup>35</sup> Using this figure would make the annual climate change cost of UK aviation emissions £4.3 billion.

48. However, the cost of carbon approach is fundamentally flawed. The highest costs of emissions and climate change cannot be measured in monetary terms. The World Health Organisation estimates that already 150,000 people are dying every year from the effects of climate change,<sup>36</sup> and this number will get much higher the more we cause temperatures to rise through our emissions. The highest costs of emissions are not financial but are the loss of life around the world as a result of climate change.

49. The Intergovernmental Panel on Climate Change (IPCC) reported in 2007 that based on past emissions, over the next two decades we are likely to see:

- Crop productivity declining in tropical areas with global 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.<sup>37</sup>

50. The IPCC went on to report that if the world does not act quickly to mitigate greenhouse gas emissions, we could see temperature increases of 3.2 to 6.1°C over the course of this century.<sup>38</sup> 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

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- Decreased water availability in Asia affecting more than *one billion* people by 2050
- Crop revenues for farmers in Africa falling by 90 per cent by 2100.<sup>39</sup>

51. Using a financial value for external costs is also deeply unjust. GDP per person on a Purchasing Power Parity (PPP) basis in Bangladesh is US\$2,053, and in Malawi is US\$667. In the UK it is US\$33,238.<sup>40</sup> It would take the devastation of the livelihoods of 16 Bangladeshi or 50 Malawi citizens from the effects of climate change to equal the devastation to one UK citizen, under a cost of carbon analysis. This is unjust. Such cost of carbon values should not be part of UK government policy to tackle climate change.

52. A more robust approach, as set out in this submission, is to ensure all the measures are taken to keep the increase in global temperatures to a maximum of 2°C. The UK government has rightly said that average global temperature should not be allowed to increase by more than 2°C. Therefore, the UK government has to ensure emissions are reduced as required to keep the global temperature increase to a maximum of 2°C.

53. On the basis of science from the IPCC, UK emissions have to be reduced by at least 40 per cent by 2020, 60 per cent by 2030 and more than 80 per cent by 2050. As was shown earlier, this cannot happen if UK aviation is allowed to continue to grow. The cost of aviation will need to increase to halt the growth in UK aviation. This is the measure of extra cost on aviation which the UK government should be using, not an arbitrary and unjust shadow price of carbon.

54. In summary:

- The global warming costs of aviation will be felt primarily through the loss of lives and livelihoods of poor people across the world, especially in developing countries
- Equating the global warming costs of aviation solely with economic costs of climate change is unjust

## 7. Conclusion

55. In conclusion:

- The UK has to greatly reduce its emissions
- There is currently slow progress in doing so
- Aviation makes-up 10 per cent of the UK's contribution to climate change
- Under Department for Transport projections for growth in aviation emissions it will be extremely difficult, and probably impossible, for the UK to meet its climate change targets set under the Climate Change Act 2008
- Expansion of aviation requires very large reductions in emissions very soon from all other sectors, for which there are currently no plans or policies
- The Department for Transport predictions of efficiency improvements are very optimistic compared to the average over 1990-2007

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- Only half the UK population fly in one year; flying is an activity dominated by the rich
- There is no social justice reason why aviation should be treated as a special case
- Including aviation in the EU Emissions Trading Scheme (ETS) will do little to reduce emissions either in the aviation sector or other sectors
- Including aviation in the EU ETS will not ensure the UK meets its legally binding targets to reduce emissions by 2020 under the Climate Change Act 2008
- The global warming costs of aviation will be felt primarily through the loss of lives and livelihoods of poor people across the world, especially in developing countries
- Equating the global warming costs of aviation solely with economic costs of climate change is unjust

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<sup>20</sup> Department for Transport prediction

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<sup>22</sup> In 2012, aviation will be allocated permits to emit the equivalent of 97 per cent of the sector's emissions in 2004/06.

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<sup>24</sup> Department for Transport prediction

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