



Adding capacity at Heathrow airport: Department for Transport consultation

Response by the World Development Movement

February 2008

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1. Introduction

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.

The Department for Transport consultation document on adding capacity at Heathrow says that the consultation "is concerned with the local environmental impacts of future development and operations at Heathrow airport" and that "the global challenge of climate change" is "outside the scope of this consultation".¹ We note that the government code of practice on written consultation says: "the agenda should not be so rigidly defined as to deter respondents from offering views on related questions of interest to them".²

Adding capacity at Heathrow will have implications for the UK government's approach to tackling climate change. The Aviation White Paper was agreed in 2003 which argued that a third runway and extra capacity at Heathrow was consistent with the government's objectives in tackling climate change. Since then:

- emissions from aviation have increased by more than 20 per cent between 2002 and 2006
- the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report was produced in 2007 outlining the current scientific knowledge on climate change, the impacts of climate change, and what needs to be done to mitigate those impacts
- the UK government's own Stern review reported in 2006, which said that the world should aim to keep the concentration of greenhouse gases in the atmosphere to between 450-550 parts per million of CO₂eq
- a climate bill has been introduced into, though not yet passed by, parliament. There is currently a debate in parliament as to whether the targets for reduction in UK CO₂ emissions need to increase from 26 and 60 per cent by 2020 and 2050 to 40 and 80 per cent respectively. At the least, the Committee on Climate Change will advise the government by December 2008 on whether the target needs to increase.

Furthermore, the consultation document does address the issue of climate change in chapter 1. There are serious flaws in some of the measures to tackle aviation's contribution to climate change which are mentioned in this section. We address what these flaws are in sections 5 and 6 of this submission.

The global challenge of climate change should form part of the scope of the consultation for adding capacity at Heathrow. WDM's response to the consultation therefore focuses on the implications of extra capacity at Heathrow for tackling climate change.

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In this consultation response we argue that for the UK to effectively tackle climate change and play its part in preventing disastrous impacts on millions of poor people around the world, the UK government should refuse permission to:

- changing Heathrow's operations to mixed mode from 2015-2019 creating a 12 per cent increase in air passenger movements
- building a third runway from 2020 creating a 50 per cent increase in air passenger movements

2. The climate change context

Climate change is a threat to the future well-being of billions of people around the world (A summary of the impacts of climate change and the inequality of global emissions is in the Appendix). The Intergovernmental Panel on Climate Change (IPCC) reported in 2007 that to keep the increase in global temperatures to between 2°C and 2.4°C 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 2050.³ 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 2050⁴

	Global	UK
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

For global emissions to peak by 2015 at the latest requires sizeable reductions in emissions in rich countries like the UK to begin straight-away. To reduce emissions by more than 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.

However, the UK government's current targets are to reduce CO₂ emissions by 26-32 per cent by 2020 and 60 per cent by 2050, on 1990 levels. The Prime Minister has acknowledged that the current targets for emissions reduction are not enough, saying in a speech on the 19 November 2007 that: "the evidence now suggests that, as part of an international agreement, developed countries may have to reduce their emissions by up to 80 per cent [by 2050]. So we will put this evidence to the committee on climate change and ask it to advise us, as it begins to consider the first three five-year budgets, on whether our own domestic target should be tightened up to 80 per cent".⁵

The weakness of the UK's current targets has also been recognised by the United Nations. The United Nations Development Programme said in their annual Human Development Report in 2007: "Emission targets in the [UK] 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 ... *If the rest of the developed world*

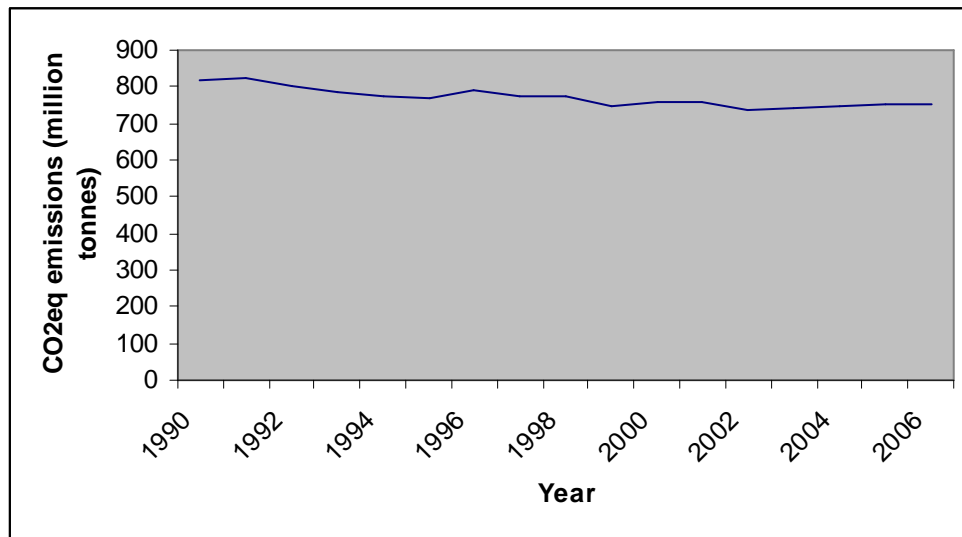
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*followed the pathway envisaged in the United Kingdom's Climate Change Bill, dangerous climate change would be inevitable. [Emphasis added]."*⁶

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 (see Graph 1 below based on figures in Table 12 in Appendix).

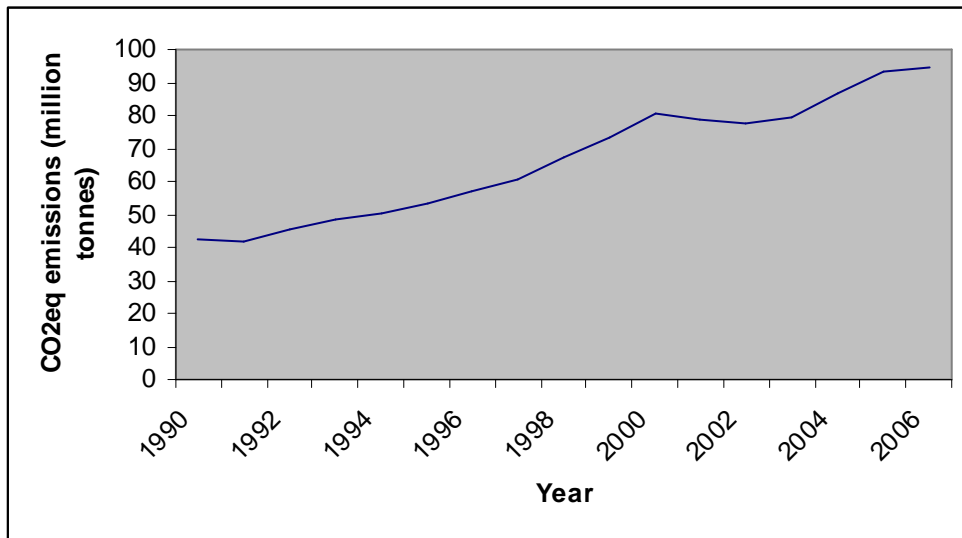
Graph 1. UK CO₂eq emissions 1990-2006 (including international aviation and shipping, and non-CO₂ impacts of aviation)⁷



Defra report that in 2006, the UK's total CO₂eq emissions were 652.3 million tonnes.⁸ This does not include CO₂ emissions from the UK's share of international aviation and shipping, and non-CO₂ emissions from international and domestic aviation. The Department for Transport estimates that UK aviation causes 2.5 times more warming than from CO₂ alone.⁹ Including these emissions therefore raises total UK emissions to 751.6 million tonnes of CO₂eq. Of this, 12.6 per cent of emissions are from aviation (for all these calculations, see Table 12 in Appendix).

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

Graph 2. UK CO₂eq emissions from aviation, 1990-2006¹⁰



The context in which the decision on extra capacity at Heathrow is being taken is that:

- the UK has to make major reductions in its emissions
- there is currently slow progress in doing so
- UK aviation's contribution to climate change is growing

3. Emissions from Heathrow

UK aviation was responsible for 94.8 million tonnes of CO₂eq emissions in 2006.ⁱ We have not been able to source an official estimate for Heathrow's proportion of this. It is particularly disappointing that the consultation document does not have figures for Heathrow's current CO₂eq emissions, and the predicted emissions if added capacity is allowed at Heathrow.

Heathrow was responsible for 28.6 per cent of UK airport passenger movements in 2006.¹¹ Therefore, we can roughly estimate that Heathrow was responsible for 28.6 per cent of UK aviation emissions in 2006: 10.8 million tonnes of CO₂ and 27.1 million tonnes of CO₂eq. This makes Heathrow the largest single-site contributing to climate change in the UK. Drax coal power station, the largest industrial emitter in the UK, produced 22 million tonnes of CO₂eq in 2006.¹²

Heathrow currently has greater CO₂ emissions than most sub-Saharan African countries, such as Kenya, Ghana, Tanzania, Zambia and the Democratic Republic of Congo (see Table 2 below). And this does not include the effects of non-CO₂ emissions.

ⁱ Defra says in 2006 emissions were 35.6 million tonnes of CO₂ for international aviation and 2.3 million tonnes for domestic aviation. Using the 2.5 multiplier, this is 94.8 million tonnes of CO₂eq.

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Table 2. CO₂ emissions from Heathrow and selected countries¹³

Country / airport	Annual CO ₂ emissions (million tonnes)	Population (millions)
Heathrow	10.8	N/A
Kenya	9.9	35.4
Ghana	6.7	22.5
Tanzania	4	38.5
Zambia	2.5	11.5
Democratic Republic of Congo	2.4	58.7

Below we predict Heathrow's future CO₂eq emissions, based on the Department for Transport estimates of growth in air passenger movements at Heathrow. We assume that aircraft efficiency improves by 1 per cent a year. We estimate that Heathrow's emissions will grow by 6.2 million tonnes of CO₂eq by 2015 (23 per cent), 8.4 million tonnes of CO₂eq by 2020 (31 per cent) and 11.7 million tonnes of CO₂eq by 2030 (43 per cent) (see Table 3 below).

Table 3. Estimated CO₂eq emissions from future development of Heathrow

Year	Air passenger movements (millions per year)	Estimated Heathrow emissions (CO ₂ eq)
2006	67	27.1
2015	90	33.3
2020	101	35.5
2030	122	38.8

Adding capacity at Heathrow will therefore increase emissions by 43 per cent by 2030, at the same time as total UK emissions need to *fall* by at least 60 per cent by 2030. If the UK did reduce emissions by 60 per cent by 2030 whilst allowing Heathrow to grow, Heathrow *alone* will be responsible for 12 per cent of the UK's contribution to climate change in 2030.

The UK government has argued that other sectors can cut emissions by more to let aviation grow.¹⁴ However, the government is not planning for this to happen. Other sectors are being expected to reduce their combined emissions by 60 per cent by 2050, but there are no plans for them to reduce by more to cancel out the growth in aviation.

In the 2007 Department for Transport paper 'Towards a sustainable transport system', emissions pathways are set for five sectors covering UK domestic emissions, although not international aviation. These show CO₂ reductions on 2000 levels for the energy, industry, residential, services and transport sectors, to cut emissions by 60 per cent by 2050 (see Graph 3 and Table 4). They do not show that non-aviation sectors will reduce by more than 60 per cent, in order for aviation to increase its emissions.

Graph 3. UK MARKAL macro carbon emissions reduction by sector – scenario showing least cost route to 60% reduction by 2050¹⁵

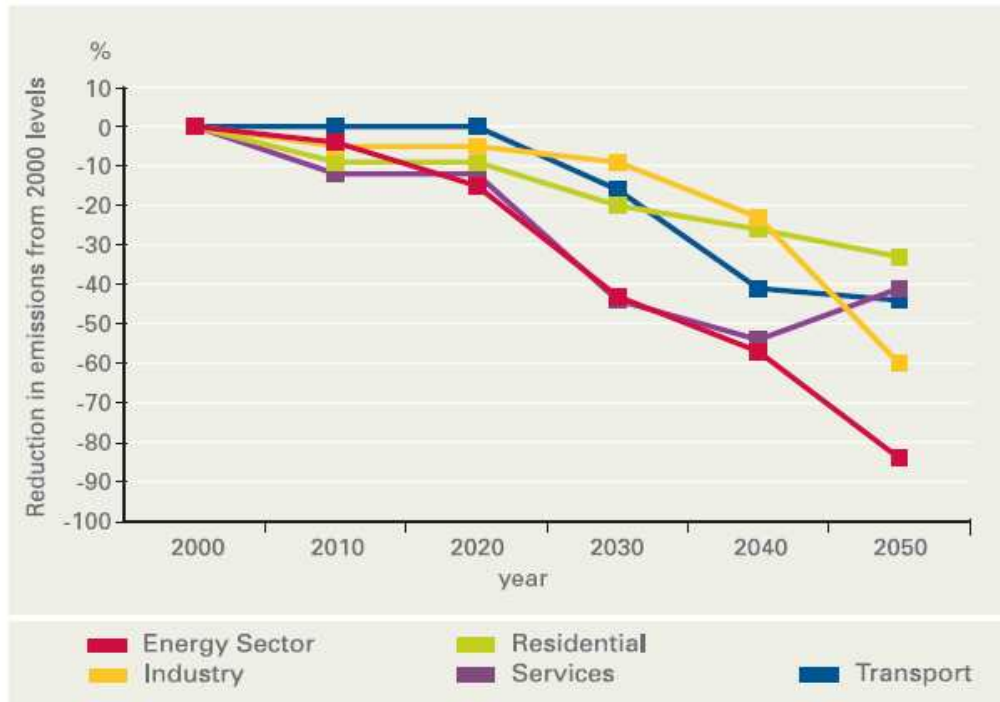


Table 4. UK MARKAL – Macro model – emissions reduction pathways by sector to achieving a 60% reduction in total UK emissions by 2050: figures extrapolated from Graph 3 (million tonnes of CO₂)

Year	Energy	Industry	Residential	Services	Transport	Total	% cut on 1990 levels
1990	242.4	120.8	78.5	30.9	116.6	589.2	
2000	196.8	113.7	85.8	29.6	123.2	549.1	6.8
2005	214.3	103.6	83.3	26.2	129	556.4	5.6
2020	167.3	108	78.9	26	123.2	503.5	14.5
2050	29.5	45.5	58.3	17.5	67.8	218.6	62.9

Furthermore, by 2020 these emissions pathways only reduce CO₂ emissions by 14.5 per cent on 1990 levels by 2020. By 2020, the UK government is not planning for domestic sectors to make the cuts needed to their own emissions, never mind make additional cuts to compensate for the growth in emissions from added capacity at Heathrow airport. Presumably, the government intends for the extra reductions to come from buying carbon credits from outside the UK through the EU Emissions Trading Scheme. The Emissions Trading Scheme is discussed in section 5.

In summary:

- Heathrow is already the largest single-site contributor to climate change in the UK
- Expansion of Heathrow will lead to an increase in UK emissions
- The government has no plans for other sectors in the UK to reduce emissions to counter-act the increase in Heathrow's emissions.

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4. Growth in UK aviation

Adding capacity at Heathrow is a significant part of the plans to grow aviation in the UK. Various estimates have been made of aviation emissions under current government policies, including allowing extra capacity and a third runway at Heathrow (see Table 5 below). The Department for Transport emission estimates are conservative when compared with estimates from more independent sources.

Table 5. Different predictions for emissions from UK aviation (million tonnes of CO₂eq)

Year	Tyndall Centre	Owen and Lee ⁱ	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

Table 6. Maximum UK emissions allowed to prevent global temperature increasing by more than 2°C

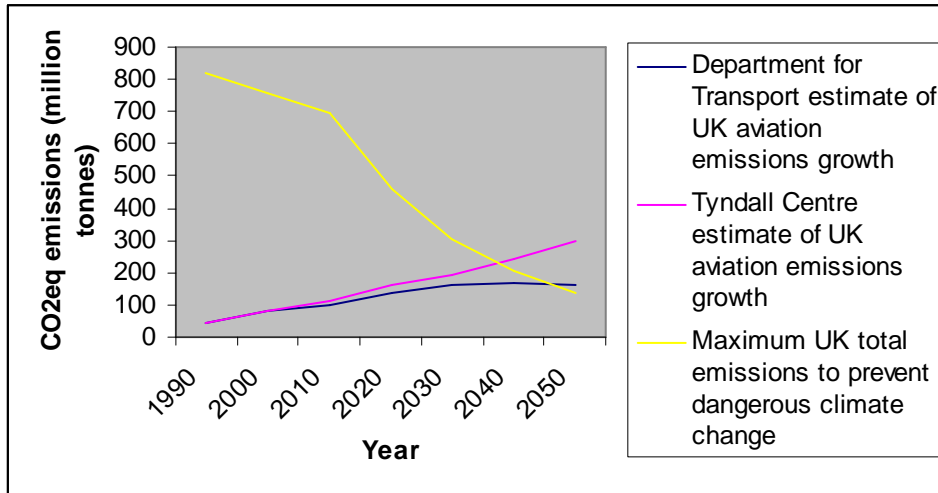
Year	UK CO ₂ eq emissions
2020	491.3
2030	327.5
2050	163.8

Even using the Department for Transport's conservative estimates for aviation emissions growth - whilst ensuring the UK reduces emissions as needed to tackle climate change - by 2020 aviation will be responsible for 23 per cent of UK emissions, 50 per cent by 2030 and 100 per cent by 2050 (see Graph 4 below).

To reduce UK emissions by 80 per cent by 2050 whilst allowing aviation to expand, every other sector would have to reduce emissions by 100 per cent by 2050; ie not use any fossil fuels. The UK government has no intention of making this happen; it is only planning for other sectors to reduce by 60 per cent by 2050. The UK cannot tackle climate change and allow aviation to expand. The expansion of Heathrow is a central part of the expansion of aviation in the UK. Both are incompatible with tackling climate change.

ⁱ Is for scheduled traffic only.

Graph 4. The incompatibility of aviation growth and UK reducing emissions as needed to prevent dangerous climate change



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 7 below).¹⁶ In contrast, virtually 100 per cent of the UK population use electricity, home heating and road or public transport every year.

Table 7. Proportion of UK population who have flown in the last year¹⁷

	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%

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.¹⁸ 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 2004.¹⁹

There is no social justice reason why aviation should be treated as a special case. There is no reason why aviation should be allowed to increase its

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contribution to climate change when all other sectors are expected to reduce their contribution.

In summary:

- The Department for Transport estimates for aviation emissions growth are conservative
- Even using these estimates, the UK cannot reduce emissions as required to prevent dangerous climate change whilst allowing aviation to grow
- Only half the UK population fly in one year, and flying is an activity dominated by the rich
- It is socially unjust for aviation to be allowed to increase emissions when all other sectors have to reduce emissions.

5. Aviation in the EU Emissions Trading Scheme

The consultation document on adding capacity at Heathrow says: “Under current proposals, aviation emissions would be capped at the average level over the period 2004 to 2006. This means that when trading is established, any additional emissions above that level, including any arising from expansion of Heathrow, would lead to no increase in total emissions, since airlines would have to pay for the equivalent emissions reductions in other sectors.”²⁰

The reasoning of the government 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 to happen. In Table 8 we set out theoretically how this could work.

Table 8. Theoretical effect on UK emissions in 2020 aviation being included in the EU Emissions Trading Scheme

Year	Non-aviation emissions	Aviation emissions	Extra reductions aviation needs to buy from other sectors	Total emissions
1990	776.3	42.3	0	818.6
2004/06	659.1	91.7	0	750.8
2020	465.8 (40% reduction on 1990 levels)	136.5 ⁱ	111.1	492.1 ⁱⁱ

In this example, non-aviation sectors reduce their emissions by 40 per cent on 1990 levels by 2020. Aviation emissions grow in line with Department for Transport predictions. For the UK to still reduce total emissions by 40 per cent by 2020, aviation emissions would need to actually be reduced by 40 per cent on 1990 levels by 2020; taking aviation emissions down to 25.4 million tonnes of CO₂eq. Therefore, aviation needs to pay to reduce emissions by 111.1 million tonnes of CO₂ (136.5 – 25.4 = 111.1). Total UK emissions would be 492.1 million tonnes of CO₂eq in 2020, a 40 per cent reduction on 1990 levels.

ⁱ Department for Transport estimate

ⁱⁱ 465.8 + 136.5 – 111.1 = 492.1

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

The EU has not finally decided how aviation will be included in the Emissions Trading Scheme. It is likely that it will be included from 2012. We base all of the below on the position agreed by the Council of Ministers in December 2007.²¹

5.1 Permits allocated based on emissions in 2004/06

The aviation sector will be allocated permits to emit equivalent to the sector's average emissions from 2004 to 2006. The growth in aviation emissions from 1990 to 2004/06 is not accounted for. Whilst aviation will have to get permits to emit for emissions above 2004/06 levels, it will not have to do so for emissions growth before 2004/06.

In the UK, aviation emissions were 42.3 million tonnes of CO₂eq in 1990, compared to the average of 91.7 million tonnes of CO₂eq for 2004 to 2006. Aviation emissions grew by 49.4 million tonnes of CO₂eq between 1990 and 2004/06 which will not be reduced in any sector with aviation's inclusion in the EU ETS.

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.

Therefore, aviation only has to pay for 44.8 million tonnes of emission reductions from other sectors, rather than 111.1 million tonnes (see Table 9 below). Aviation does not have to pay for the growth in aviation emissions between 1990 and 2004/06 to be reduced elsewhere. Neither does aviation have to contribute to emission cuts below 1990 levels, unlike every other sector.

Table 9. Effect on UK emissions in 2020 of permits being allocated for aviation on 2004/06 emissions

Year	Non-aviation emissions	Aviation emissions	Extra reductions aviation needs to buy from other sectors	Total emissions
1990	776.3	42.3	0	818.6
2004/06	659.1	91.7	0	750.8
2020	465.8 (40% reduction on 1990 levels)	136.5	44.8	557.5 ⁱ

5.2 Only CO₂ emissions from aviation will be included in the EU ETS

Under the Council of Ministers proposals, only CO₂ from aviation will be included in the emissions trading scheme; non-CO₂ 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 CO₂ emissions. This is 17.9 million tonnes of CO₂ between 2004/06 and 2020

ⁱ 465.8 + 136.5 - 44.8 = 557.5

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rather than 44.8 million tonnes of CO₂eq (see Table 10 below). The increase in non-CO₂ impacts of aviation will not be reduced elsewhere.

Table 10. Effect on UK emissions in 2020 of permits being allocated for aviation on 2004/06 emissions, and only addressing CO₂ emissions

Year	Non-aviation emissions	Aviation emissions	Extra reductions aviation needs to buy from other sectors	Total emissions
1990	776.3	42.3	0	818.6
2004/06	659.1	91.7	0	750.8
2020	465.8 (40% reduction on 1990 levels)	136.5	17.9	584.4 ⁱ

5.3 Use of credits from outside the EU

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 Joint Implementation and Clean Development Mechanism projects.

Under the proposed continuation of the main ETS scheme, if no global agreement on tackling climate change post-2012 is reached, then one-third of required emissions reductions from 2013 to 2020 can be met through purchasing Joint Implementation and Clean Development Credits from overseas. If a global agreement is reached, then *half* of the additional emissions reductions required under the ETS can be bought from outside Europe.²² As outlined above, aviation does not have to make any emission reductions, so it is unclear what this means for aviation. However, it is clear that the aviation sector will be able to cover some of its emissions, if not all those above its permit allocation, by buying permits from outside Europe.

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 CO₂ emissions, whilst containing 20 per cent of the world’s population. Developing countries account for 46 per cent of CO₂ emissions, and have 80 per cent of the world’s population.²³

To meet global emission reduction targets to prevent dangerous climate change (see section 2 above), industrialised countries like the UK have to reduce emissions by 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.

ⁱ 465.8 + 136.5 – 17.9 = 584.4

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Assuming that the aviation sector buys one-third of its emission permits from outside Europe,ⁱ this means that rather than needing to buy permits to emit 17.9 million tonnes of CO₂ from other sectors in the UK, aviation only has to buy 11.8 million tonnes (see Table 11 below).

Table 11. The actual effect of including aviation in the emissions trading scheme

Year	Non-aviation emissions	Aviation emissions	Extra reductions aviation needs to buy from other sectors	Total emissions
1990	776.3	42.3	0	818.6
2004/06	659.1	91.7	0	750.8
2020	465.8 (40% reduction on 1990 levels)	136.5	11.8	590.5 ⁱⁱ

Even with:

- every other sector reducing emissions by 40 per cent on 1990 levels by 2020, and
- aviation being included in the ETS,

by 2020 the UK's actual contribution to climate change will have only fallen by 28 per cent, from 818.6 million tonnes of CO₂eq to 590.5 million tonnes of CO₂eq (see Table 11 above).

Of course, if other sectors reduce by less than 40 per cent, then the UK's total contribution to climate change will have fallen by even less than 28 per cent by 2020. The consultation on adding capacity at Heathrow is wrong when it says that including aviation in the ETS means aviation will "have to pay for the equivalent emissions reductions in other sectors". The government should stop pretending that including aviation in the ETS means that the growth in aviation emissions will no longer be a problem.

6. Aviation paying its external costs

The consultation document says: "The Government is addressing the global challenge of climate change by ... developing a periodic emissions cost assessment to establish the extent to which the aviation sector is already meeting its external climate change costs and to enhance our contextual understanding of the climate change costs of aviation when considering major increases in aviation capacity."²⁴

This does not commit the government to any action to ensure that aviation is paying what is viewed to be its 'environmental cost'. However, the implication is that if aviation is paying its 'environmental cost' then it is fine for aviation to expand. The government has a "shadow price for carbon" of £25 a tonne of CO₂eq emissions, which it uses as a measure of 'environmental cost'.²⁵ This is meant to measure what the costs of the emissions are for the world.

ⁱ For simplicity, we also assume that aviation buys permits from within Europe from the UK rather than other European countries.

ⁱⁱ 465.8 + 136.5 – 11.8 = 590.5

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Presumably, the government's view is that as long as aviation is paying £25 for every tonne of CO₂eq emissions, aviation can expand, because it is paying for its 'external costs'.

This 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, 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 from the impacts of climate change.

Using a financial value for external costs is also deeply inequitable. 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\$33,238.²⁶ 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.

This flawed reasoning is taken to a further extreme if the costs of carbon are compared with the supposed economic benefits of a development. In the case of Heathrow, the government compares the cost of carbon with the aviation industry's estimate of the economic benefits of aviation. But the economic benefits of aviation are primarily to the UK, and particular wealthy business sectors within the UK such as aviation and financial services. The costs of climate change fall on the poorest communities in the world, but they will not see the supposed benefits from the expansion of Heathrow, nor are they likely to be compensated by the aviation industry.

The proper approach is to increase the financial cost in order to reduce emissions as required to prevent dangerous climate change. The UK government has to set a maximum temperature rise from greenhouse gas emissions, and then ensure that emissions are reduced accordingly in line with the best available science. The UK government has rightly said that average global temperature should not be allowed to increase by more than 2°C.

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, including through adding capacity at Heathrow. 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.

7. International climate negotiations

International climate negotiations on creating mandatory targets for emissions reductions after 2012 are currently at a crucial stage. The UK emits more than double the worldwide average CO₂ emissions per person. Unfortunately, because of the high level of rich country emissions, and the current failure of rich countries, like the UK, to significantly reduce emissions, developing countries are deeply suspicious of rich countries' willingness and ability to act on climate change. The delegate of Papua New Guinea at a UN General Assembly debate on climate change in February 2008 said: "We seek leadership by example. We say, please show us how deeply emissions can be cut in all industrialized countries, rather than simply pointing fingers at the poor in developing countries."²⁷

If the UK government gives it's backing to added capacity at Heathrow, it will be supporting a highly emissions intensive infrastructure project. The UK government will have little influence in pressing for strong mandatory targets for emission reductions in climate negotiations, if it has itself recently given support to added capacity at Heathrow and the continuing growth in emissions from aviation. The position of the UK in international climate negotiations will be undermined.

8. Conclusion

- The climate change context in the UK has changed since the 2003 aviation white paper
- The UK has to make large-scale cuts in emissions, but is so far struggling to do so
- Emissions from UK aviation continue to increase
- Adding extra capacity at Heathrow guarantees further increases in emissions
- The current plans to expand aviation, of which extra capacity at Heathrow is a key part, will make it practically impossible for the UK to reduce emissions in line with the science of what is needed to prevent dangerous climate change
- The EU ETS will not make aviation pay for emissions reductions in other sectors in order to cancel out aviation emissions
- Justifying aviation expansion on the basis of it paying an arbitrary 'cost of carbon' is fundamentally unjust
- Allowing added capacity at Heathrow will undermine the UK's position in international climate negotiations.

The UK government should refuse permission to:

- changing Heathrow's operations to mixed mode from 2015-2019 creating a 12 per cent increase in air passenger movements
- building a third runway from 2020 creating a 50 per cent increase in air passenger movements.

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Appendix

Table 12. UK CO₂eq emissions 1990-2006²⁸

Year	UK stated contribution to climate change	International shipping	International aviation	Domestic aviation multiplier	Emissions which government claims have been offset by carbon credits from outside UK	Actual UK contribution to climate change
1990	770.8	6.7	39.3	2	0	818.8
1991	777.3	6.5	38.8	2	0	824.6
1992	752.9	6.7	42.8	2	0	804.4
1993	732.1	6.7	45.5	2	0	786.3
1994	719.7	6.2	47.3	2	0	775.2
1995	709	6.7	50.5	2	0	768.2
1996	729.5	7.3	53.3	2.1	0	792.2
1997	705.6	8.2	56.8	2.3	0	772.9
1998	700.9	9	63	2.4	0	775.3
1999	669.5	6.5	68.5	2.7	0	747.2
2000	671.4	5.7	75.5	3	0	755.6
2001	674.4	6.4	73.8	3	0	757.6
2002	653.8	5.3	72.5	3	0	734.6
2003	659.5	5.1	74.3	3.2	0	742.1
2004	657.9	5.9	81.3	3.5	0	748.6
2005	628.4	5.9	87.5	3.6	27.1	752.5
2006	618.5	6.8	89	3.5	33.8	751.6

The development impacts of climate change

Climate change is a threat to the future well-being of billions of people around the world. Past emissions of greenhouse gases, overwhelmingly by rich countries such as the UK, mean that the average global temperature will continue to increase for the next few decades. 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 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 2020.²⁹

The impacts which countries are currently facing come from historical emissions. The UK is responsible for more than 6 per cent of CO₂ emissions from 1850-2003, despite having less than 1 per cent of the world's current population (see Table 13 below).

Table 13. Contribution to global man-made CO₂ emissions (percentage)³⁰

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

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.³¹ 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 2100.³²

The UK government has a target of keeping the increase in global temperatures to 2°C. Whilst this will still negatively affect millions of people across the world, temperature increases higher than 2°C threaten disaster for whole regions and hundreds of millions of people. Yet those who could be affected most by climate change are those who have made the least contribution. The UK government is right to seek to limit the increase in global temperatures to a maximum of 2°C.

Global CO₂ emissions from the burning of fossil fuels were 28.2 billion tonnes in 2005; 4.4 tonnes of CO₂ per person. The UK emits around 9.6 tonnes of CO₂ per person, more than double the global rate.³³ In contrast, almost every developing country in the world emits less than the global average CO₂ emissions from the burning of fossil fuels (see Table 14 below).

ⁱ This includes high income countries as defined by the World Bank plus Russia (an upper-middle income country), which is classified by the UNFCCC as an 'Annex 1' country (i.e. a country that is part of the binding emissions reduction framework in the Kyoto Protocol).

ⁱⁱ 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.

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Table 14. CO₂ emissions per person for selected countries³⁴

Country	CO ₂ emissions per person (tonnes)
UK	9.6
World average	4.4
China	4.1
Mexico	3.8
Brazil	1.9
India	1.1
Bangladesh	0.3
Ghana	0.3
Zambia	0.2

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