

Stern review on the economics of climate change

Evidence from British Airways plc

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Summary

1. British Airways welcomes the opportunity to submit evidence to the Stern review on the economics of climate change. British Airways is the fifth largest airline in the world, measured in terms of passenger kilometres travelled, and the largest outside the United States on this measure. BA employs around 47,000 employees worldwide, 80% of whom are based in the UK, and generates annual revenues of £7.8bn (2004/5).
2. This note presents British Airways' response to the invitation from Sir Nick Stern to submit evidence relevant to the terms of reference of a joint Cabinet Office and HM Treasury review of the economics of climate change.
3. We believe that this review is an important development in the climate change debate within the UK. We particularly welcome the inclusion within the review's terms of reference of both the costs and the benefits generated by policies to tackle climate change. Much of the public debate in this area has focused on the costs of failure to act, and by implication the benefits of policy action. This approach often fails to acknowledge that attempts to reduce carbon emissions inevitably impose costs on society, and that these may be unevenly distributed between different groups.
4. Without in any way undermining the case for effective policy action to deal with climate change, it is vital that there is healthy public discussion of the relative costs and benefits of alternative policies. The Stern review should provide valuable support to policymakers, helping them to take decisions informed by balanced and evidence-based considerations of the full impact of proposed policy changes, and the distribution of those impacts.
5. British Airways is well qualified to contribute evidence to the Stern review. We aim to take a forward-looking approach to environmental matters within the air transport industry. We have consistently supported the inclusion of air transport within a broad-based emissions trading framework, which we see as the most effective way to tackle the problems of climate change while avoiding the artificial damage to the global economy inflicted by the use of taxes and charges, which are at the same time both less effective and more costly.

Principles of good climate change policy

6. There are three important principles that should inform climate change policy decisions.

Cost effectiveness

7. First, policies should be selected to achieve the greatest real improvement in environmental performance at the minimum economic cost. There are clear economic costs involved with ending or reducing the level of economic activity as a result of policy changes. In addition, costs also arise from potential

distortions to the behaviour of consumers or firms caused by the policy change, which hinder efficient resource allocation. Sound policies will therefore seek to minimise these costs while achieving the government's environmental goals. These arguments apply particularly to the use of economic instruments, which may have a substantial role to play in climate change policies.

Clear environmental rather than fiscal objective

8. Policy instruments to address climate change should target emissions reductions across the economy and provide incentive for investment in efficient technologies. Such instruments should not be designed to create revenue flows to government, as these typically have poor incentive properties for improving environmental performance.

Global approach, minimising competitive distortion

9. Third, it is clear that UK domestic action will not achieve much without wider global action. Developments in the global approach will therefore be an important factor in assessing UK climate change policies. A policy that affects UK companies disproportionately, perhaps imposing serious commercial damage, will serve to shift demand towards firms in other countries with an inferior environmental performance. This deterioration in environmental performance may offset the modest benefit achieved from UK businesses.
10. Nevertheless, we recognise that some regions may need to move faster than others in order to lead the way. However those regions taking the lead should be large enough that they can have a significant impact on climate change at a global level. Policy developments at EU level will therefore be much more effective than those confined to a single country.
11. In order to avoid continuing international competitive distortion and to effectively address the global issue of climate change, it is imperative that an international solution for addressing air transport climate change contribution is determined in time for the post Kyoto international regime. Work towards this objective must begin immediately in order to integrate the sector into global policy action in the post-Kyoto period from 2013.

Air transport and climate change

12. There is little doubt that air transport brings major economic and social benefits. However, if air transport is to be part of a sustainable economy, we recognise that it has to ensure that economic and social benefits are delivered in an environmentally responsible way. That is a key challenge facing the air transport industry in looking to its future growth and development.
13. British Airways accepts that air transport's climate change impacts must be addressed. We also recognise that if practical solutions are not found to address the impact of aircraft emissions in flight, there is increased risk of punitive measures being introduced, damaging competitiveness and delivering limited environmental benefit. We understand that EU and national policy makers need to act to address air transport's contribution to climate change and that the option of doing nothing is not acceptable.
14. The scope of any policy to address aircraft emissions should take into account technological progress both past and future, support for investment in research

and development, and the need for continued improvements in infrastructure and air traffic management. In addition to these elements, the use of economic instruments will play an important role.

15. British Airways does not accept that the right way to limit emissions is to discourage flying – by punitive taxes or constraints on industry growth. This has not been effective in curbing road transport growth and, if applied to air transport, would lead to extremely negative social and economic effects for the European economy.
16. Instead we believe that a well-designed emissions trading scheme is a cost-effective and environmentally beneficial policy instrument. Whilst an international approach through ICAO must be the ultimate objective, we recognise that some regions may need to move faster than others in developing measures to address climate change.

Air transport's contribution to the growth of energy demand

17. The growth in energy demand will depend not only on the pace of economic growth, especially in fast-growing energy-intensive economies such as China and India. It will also be related to developments in the efficiency of energy use and the speed with which energy-saving developments, both technological and other, can be transmitted across the globe.
18. In the air transport sector, the scope for the major technological breakthroughs that will shift air travel away from its current high dependence on carbon-based fuels looks fairly remote in anything but the ultra-long term. However the air transport industry has an impressive track record in consistently delivering improvements in energy efficiency, and this pattern of improved performance is set to continue as new generations of aircraft spread through global airline fleets.
19. Historically global air transport has grown by around 5% per annum since 1980, which is nearly twice the annual average rate of global GDP growth of about 3%. Aircraft fuel efficiency per passenger kilometre has improved at an annual average rate of 1.7% pa over the past decade, and the industry's consumption of fuel per unit of GDP has therefore remained broadly constant.
20. We expect the trend in fuel efficiency to continue at a rate of around 1-2% going forward, reflecting the introduction of new generation aircraft such as the Airbus A380 and the Boeing 787, which are much more fuel-efficient than their predecessors. If global air transport grows by around 3-4% a year over the next 2-3 decades, in line with industry forecasts, then this implies energy consumption growth by the air transport industry of around 2-2.5% a year.
21. Based on historical and forecast growth rates, fuel efficiency improvement will therefore be insufficient to prevent the growth of carbon dioxide emissions from aircraft. Air transport's share of total emissions is likely to increase over time, reflecting the much higher marginal abatement costs in aviation, where realistic alternatives to carbon-based fuels are still generations away.

Analysis of air transport emissions in 2050

22. Looking at the situation in the UK, some commentators have suggested that air transport will eventually absorb the majority of the available allocation of CO₂ for

the whole economy in a carbon constrained world.¹ However, using realistic estimates of growth and fuel efficiency, this suggestion is well wide of the mark.

23. Table 1 analyses the situation in the UK. The Department for Transport estimates that in 2000 air transport – including half of the emissions from international flights – generated 5.5% of total UK carbon dioxide emissions.² In 2050, depending on the growth rate of air travel and the fuel efficiency improvement which is achieved, air transport emissions will have grown to between 6.9% and 18.6% of the 2000 UK total.

UK air transport CO₂ emissions in 2050
(% of 2000 UK total emissions baseline)

Fuel efficiency gain (per annum)	Air travel growth (per annum)		
	2.5%	3.0%	3.5%
1.0%	11.4%	14.6%	18.6%
1.5%	8.9%	11.3%	14.4%
2.0%	6.9%	8.8%	11.2%

24. Table 2 shows a similar analysis for the global air transport industry, using a 1992 base – when air transport is estimated by the IPCC to have contributed about 2% of total man-made carbon dioxide emissions. Our projections for 2050 suggest that the emissions total will rise even on the most favourable assumptions – to somewhere between 3.4% and 10.9% of the 1992 global total.

Global air transport CO₂ emissions in 2050
(% of 1992 total global emissions baseline)

Fuel efficiency gain (per annum)	Air travel growth (per annum)		
	3.0%	3.5%	4.0%
1.0%	6.2%	8.2%	10.9%
1.5%	4.6%	6.1%	8.1%
2.0%	3.4%	4.6%	6.0%

25. The figures in Tables 1 and 2 give an accurate reflection of air transport's share if there is no overall reduction in total carbon dioxide emissions on the baselines shown (and no increase either). However, scientists are recommending a cut of around 60% in CO₂ emissions to stabilise the global atmosphere. Table 3 therefore shows how these figures might look in a much more carbon-constrained world, where we have successfully met the challenge of reducing CO₂ emissions by the recommended 60%. The mid-range estimates from these scenarios show that the air transport share of carbon emissions has risen to

¹ See, for example: House of Commons Environmental Audit Committee, 2003/4 Session, Third Report, March 2004; and *Decarbonising the UK: Energy for a Climate Conscious Future*, Tyndall Centre for Climate Change Research, September 2005

² Government Response to the Environmental Audit Committee's report: Pre-Budget Report 2003 - Aviation Follow-up, Department for Transport, May 2004

about 15% globally, with a range of 9% to 27%. For the UK, the figures are higher, with a central estimate of around 28% and a range of 17% to 46%.

Air transport emissions in a carbon-constrained world
(% of total emissions in 2050, assuming 60% cut on baseline)

	<i>Low*</i>	<i>Mid-range*</i>	<i>High*</i>
UK	17%	28%	46%
Global	9%	15%	27%

Low scenario = low growth, high fuel efficiency; Mid-range scenario = medium growth, medium fuel efficiency; High scenario = high growth, low fuel efficiency.

Air transport and emissions trading

26. We believe that including air transport within emissions trading – initially within the EU but eventually within a broader international scheme – is the most environmentally effective and economically efficient mechanism for dealing with carbon dioxide (CO₂) emissions from air transport.
27. To ensure that emissions trading can be introduced for European air transport without distorting international competition or imposing unreasonable cost burdens on airlines, a practical and pragmatic approach to the scheme design is needed. In particular we highlight the following design elements:
 - Emissions allowances should be distributed without cost using a benchmarking method to avoid high financial burden.
 - Allocation and target setting should be harmonised at EU level to avoid competitive distortion.
 - Coverage should initially focus on emissions from intra-EU air services to avoid international disputes and competitive distortion.
 - An international solution to integrate air transport into global policy action on climate change should be sought.

Cost implications of climate change policy instruments applied to air transport

28. In order to achieve the necessary reductions in greenhouse gasses, the cost of economic activities and products that are energy intensive will need to rise. Given that a well designed emissions trading scheme offers a least cost approach to addressing the climate change contribution of air transport, this translates directly as the least cost approach for consumers.
29. While there are some cost risks attached to emissions trading, these pale into insignificance when we consider the alternatives – which are generally based on punitive taxes and charges. Taxation applied to emissions, fuel usage or directly to air travel would not only be bad for the economics of our industry, it would also be bad environmental policy. A tax which doubled the cost of aviation fuel - costing airlines and their customers \$50bn a year - would cut less than 0.5% off

the growth rate of air traffic over a 30-year period. We are daily reminded of the ineffectiveness of a tax-based approach on the roads in the UK and the rest of Europe. Very high motor fuel taxes have not prevented the continued growth of traffic and emissions and the associated problems of congestion.

30. Whilst emissions trading is potentially the most cost-effective instrument for reducing the impact of air transport on climate change, the design of a scheme will have significant impact on the extent and distribution of costs. The objective should be to minimise costs and maximise benefits through careful instrument design.
31. Emissions allowances should be distributed without cost using a benchmarking method. Unlike the standard grandfathering method that uses historical emissions data, benchmarking does not penalise operators that already use fuel-efficient aircraft and provides incentive for future investment in such aircraft. British Airways is against the use of auctioning as a method to distribute emissions allowances. Auctioning would not be consistent with the allocation approach for all other sectors in the EU ETS, and would create a significant financial burden for air transport operators.

Emissions trading and the competitiveness of EU air transport

32. The ultimate objective should be a policy approach at international level. An international approach should be guided by the International Civil Aviation Organisation (ICAO) and United Nations Framework Convention on Climate Change (UNFCCC) processes. It is however recognised that there are differing regional pressures to address climate change. Linking air transport CO₂ with the EU ETS would be a significant first step towards the global objective.
33. As air transport operates in a highly competitive international market, it is crucial to the acceptance of an ETS that any associated market distortions are minimised as far as possible. Clearly, differences in the characteristics of fleets, operations, cost structure, market mix, and so on preclude the total avoidance of any distortion, but steps must be taken to minimise the effects.
34. As with costs, the impact of a scheme on international competitiveness will depend to a large extent on key design elements of the scheme as related to air transport. To avoid unnecessary competitive distortion, emissions allowances should be distributed free of charge, this approach is consistent with the approach to all other sectors in the EU ETS and avoids placing high financial burdens on EU air carriers.
35. The distribution of emissions allowances and setting of reduction targets in the current scheme is managed by each member state, based on the Kyoto Protocol concept of subsidiarity – each state has the right to decide how emissions reductions are shared among its emitters. However, if this approach were applied to air transport, significant distortions in competition would occur. Given the mobile nature of air transport emissions and the provisions of the European Open Aviation Area, whereby EU air carriers are free to operate air services between any two points in the EU, it is essential that a harmonised EU-level approach to allocation and target setting is adopted for air transport. There would clearly be benefits in terms of operability and simplicity if domestic emissions could also be captured by this harmonised approach.

36. It is appropriate that an emissions trading regime would capture all flights operating within the EU that are both domestic and intra-European. Attempts to include all flights from and to non-EU countries (extra-EU) would result in international disputes, leading to retaliatory action and high risk of disruption to existing operations. Legal action has the potential to significantly delay full implementation of an extra-EU scheme and may lead to exemptions and compromises for particular countries, opening the potential to significantly damage the competitiveness of EU based carriers.
37. At this stage, the EU should focus on implementing emissions trading for air services within the EU 'domestic' block. In the long term, international air transport emissions should be included in an international policy framework to address climate change. However, this must be agreed through the appropriate international bodies – ICAO and UNFCCC.
38. In relation to other transport modes, a policy instrument that addresses the climate change impacts of air transport whilst not encompassing other transport modes will inevitably distort the inter-modal competitive position to some extent. Policy measures should be developed to address the climate change impacts of all transport modes across Europe in an equitable way.

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