

Counting the cost

**BAA's response to the HM Treasury & Department for Transport discussion
*Aviation and the Environment: Using Economic Instruments***

June 2003

1. Introduction

Sustainable development

- 1.1 BAA is committed to the principle of sustainable development and supports the Government's core sustainability objectives, namely:
- maintenance of high and stable levels of economic growth
 - social progress which recognises the needs of everyone
 - prudent use of natural resources
 - effective protection of the environment.
- 1.2 In accordance with this, BAA also accepts the principle that aviation, in common with all other industries and modes of transport, nationally and internationally, should meet the external costs of its activities.
- 1.3 We are aware that there are many ways of defining external costs and a wide range of estimates from a variety of stakeholder perspectives, some of whom believe the external costs of aviation are already met in full and some who believe they are not. There are also many ways that external costs can be met and a range of actions and policy instruments are available for ensuring this happens. In our response to Aviation and the Environment: Using Economic Instruments we discuss the range of environmental impacts and costs and set out the range of actions and policies and provide our own assessment of how the external costs of aviation can most effectively be met.

The environmental impacts of aviation

- 1.4 It is widely accepted that the main environmental impacts of aviation are:
- climate change
 - noise
 - local air quality

In addition, there are lower-level impacts and costs associated with air transport, including waste, water quality, the use of natural resources, biodiversity, land use and heritage.

Actions and policies for addressing environmental impacts

- 1.5 Governments and the aviation industry have a range of actions and policies available to them at a local, national and international level for addressing the environmental impacts of air travel. This range includes:
- voluntary action to improve environmental performance
 - planning controls
 - national regulatory policies and standards
 - international regulatory policies and standards
 - economic instruments.

- 1.6 BAA believes that the selection of the appropriate tool will depend on the particular circumstances of the impact involved. In many cases, voluntary action within the industry itself will address the impact, although in others international standards may need to be established. It is important that care is taken to ensure that action is taken at the most appropriate level. BAA believes that local impacts should, where possible, be addressed locally, national impacts nationally, and global impacts globally. While Government-led economic instruments can have a role to play in ensuring that aviation meets its external costs, such instruments should not be the automatic first choice of policy-makers if other measures are available.

Tests for selecting the appropriate policy tool

- 1.7 In deciding which policy instrument to use, policy-makers should assess them against a number of tests. BAA believes any instrument should be:

Effective – will it target the impact directly and control it?

Appropriate – is it applied at the appropriate level, so that global impacts are addressed globally, and local impacts are addressed locally?

Fair – is it being applied fairly, in a way which does not discriminate?

Equitable – is it applied equally to other industries making the same impact?

Proportionate – is the cost of the measure proportionate to the scale of the impact? Is the cost covered just once?

Economically efficient – is the application of the measure likely to achieve the desired result at least-cost, and minimise any wider economic impacts?

Non-distorting – is the application of the measure likely to distort the market, and especially, is it likely to change the balance of competitiveness in aviation and the economy generally between the UK and other countries?

Market-based – is the value of the cost being tackled determined by market forces, rather than by administrative estimates?

Hypothecated, where appropriate – where revenues are generated, are they used directly to address the impact, or are they taken out of the industry for other uses, leaving the impact unaddressed?

- 1.8 It is important to apply these tests, because any mechanism which simply calculates a monetary value for an environmental impact and captures this through a charge or tax will not necessarily deliver the desired environmental result. It is possible – likely even with such a mechanism – that revenue will be collected which reflects the cost of the environmental impact, but the impact will itself remain unaddressed.
- 1.9 Furthermore, a mechanism which targets the activity *per se*, rather than the impact of the activity is likely to have a disproportionate impact. While BAA accepts that the consequence of meeting the external costs of aviation is that the price of flying may rise, and therefore demand will be reduced, we firmly reject an approach of blind ‘demand management’, which sets out deliberately to suppress demand as the crude policy mechanism for reducing, in an unpredictable way, the environmental impacts. The logical extension of this approach would be that any industry which had a negative impact on the environment should be prevented from growing, which would have a catastrophic impact on the UK’s productive, wealth-creating future.

- 1.10 Within a policy of sustainable development, however, BAA does believe both that there is an appropriate role for instruments which manage demand in the most environmentally effective way, and that there are some environmental limits to growth. Heathrow and Gatwick airports have the most intensively-used runways in the world, where the demand for slots far outstrips the available capacity. BAA's management of the demand has therefore made these airports the most productive and efficient in the world, in terms of passenger throughput per runway. Our experience of having to manage the unfulfilled demand at Heathrow and Gatwick is also the reason that BAA rejects the view that the policy towards aviation is one of 'predict and provide'.
- 1.11 In terms of environmental limits, clearly the earth's capacity to carry greenhouse gases is one, and BAA agrees that this global limit should not be breached. Another is health-based local pollution limits, such as those due to come into force across the EU in 2010, which BAA believes must be recognised and met. BAA believes that in preparing the forthcoming Air Transport White Paper, the Government can be confident that effective instruments are available to internalise external costs, and address the industry's environmental impacts. As we demonstrate later, some policy instruments are significantly more environmentally effective than others. It is critical that the Government establishes the appropriate mix of policy instruments - ranging from market-based options to more traditional forms of regulation - to support the growth of a vibrant and sustainable aviation industry. With the right mix of instruments, including economic instruments, the objective of achieving sustainable development would be entirely compatible with the future growth of the UK aviation industry.

2. The environmental costs of aviation

2.1 The discussion paper *Aviation and the Environment* sets out the Government's estimates of aviation's external costs for each of the core impacts of climate change, noise and local air quality. The Government recognises that significant uncertainty exists around estimates of external costs, and BAA welcomes this recognition.

2.2 The discussion paper estimates the external costs as:

Climate change £1.4 billion pa in 2000, rising to £4.8 billion pa by 2030

Noise £25 million pa in 2000

Local air quality £119-£236 million pa

2.3 BAA has not undertaken its own independent assessment of these costs and is not therefore presenting alternative estimates. However, BAA does have a number of comments on the cost estimates as presented in the Government's discussion paper, and some observations about the extent to which aviation is already meeting a substantial part of the external costs of its activities.

Climate change

2.4 BAA understands the scientific evidence on which the estimate of the cost of climate change has been based, but we also note that despite significant progress in recent years, there is still significant scientific uncertainty around the climate change effects of carbon emissions, particularly as emissions occur at different atmospheric levels. There is also considerable difficulty in attaching precise financial values to the predicted climate change impacts. The cost of carbon will always have to be based, to a significant degree, on value judgements such as the valuation of future impacts relative to current impacts, and the degree to which differences in the regional valuation of impacts should be reflected in climate change cost estimates.

2.5 As noted in *Aviation and the Environment* (Annex A, para A.6) the Government has decided to undertake a further review of the recommended social cost of carbon figures. This highlights the need for frequent reviews of the inputs to the estimates of external costs to keep pace with scientific and academic understanding of the relevant issues. However, there will always be a limit to the precision that can be achieved by advances in scientific understanding, given the need for value judgements to be made.

2.6 The Government's estimate of the cost of carbon emissions depends on several factors:

- a cost of carbon of £70 per tonne, rising by £1 per tonne a year to £100 per tonne by 2030
- the forecasts of emissions growth
- a radiative forcing effect of 2.7.

Cost of carbon

2.7 The illustrative figure of £70 per tonne of carbon is taken from Defra's guidance on valuing the cost of carbon emissions. The Government Economic Service working

paper from which the illustrative value is taken¹, recognises the range of uncertainty that exists around valuations of climate change costs and recommends using a sensitivity range for the cost of carbon of £35 and £140 per tonne. If this range were applied to the Government's estimates, it would mean a range of total climate change costs for 2000 of between £700 million and £2.8 billion.

- 2.8 Given the range of uncertainty, BAA believes that it is more appropriate that the external costs of climate change are expressed through the use of scenarios or ranges. Such an approach, would have provided a better understanding of the range of cost estimates that could have been derived, using different assumptions for the key parameters. BAA believes the use of a single point estimate provides a false sense of certainty in the cost estimates.
- 2.9 In deriving an estimate of the climate change costs associated with carbon emissions, Government has used a 'damage cost' approach, which assesses the cost of the impact on society. An alternative would have been to use a 'prevention cost' approach, which estimates the cost of preventing the impact in the first place. Using a 'prevention costs' approach would have led to a different range of costs for climate change impacts.
- 2.10 Research commissioned recently by BAA shows that the predicted costs for possible abatement measures would be lower in the early years of an emissions trading scheme, and then rise as airlines and other participants found it increasingly difficult to identify and secure further abatement opportunities, and as demand for permits increased over time. These increases in costs would be mitigated to some extent by additional technological progress initiated by the emissions trading scheme.

Forecasts of carbon emissions

- 2.11 A second key input to the Government's estimates of aviation's climate change costs are the forecasts for CO₂ emissions. The discussion paper includes a range of forecasts for CO₂ in 2030. Emissions of CO₂ in the year 2000 have been estimated at around 30 million tonnes. By 2030, the Government have forecast that emissions of CO₂ will have more than doubled, to around 70 million tonnes.
- 2.12 As with the cost of carbon issue, there is considerable uncertainty around future CO₂ emissions. The quantity of CO₂ emitted by the aviation industry will depend on many factors, principally related to technological progress with aircraft fuel efficiency, increases in average aircraft size, future operational improvements and the demand-side and supply-side responses to new economic instruments.
- 2.13 The Government accepts that the estimates of CO₂ emissions used in calculating the industry's external costs are 'conservative' (Annex D, para D.17). In other words, it is likely that that the Government's forecasts overstate future CO₂ emissions. As the Government acknowledges, this is largely because future 'business as usual' improvements in fuel efficiency have not been factored into the CO₂ forecasts.
- 2.14 Nor do the Government's estimates assess the supply-side or demand-side responses that might be triggered by policy instruments. BAA is confident that the 'right' policy instruments would encourage a more rapid take-up of new technologies and stimulate further technological innovation, beyond those already assumed in the forecasts. These supply-side responses would take some time, but they offer the prospect of significant fuel efficiency improvements beyond those assumed in the Government's estimates. On the demand-side, BAA recognises that an increase in the cost of air travel caused by the introduction of economic instruments would, in isolation, tend to reduce the level of demand.

¹ Government Economic Service Working Paper 140: Estimating the Social Cost of Carbon Emissions

- 2.15 For this reason, the Government's estimates should be considered, all other things being constant, to be the top-end of a range of external costs for the aviation industry.

Radiative forcing

- 2.16 The radiative forcing index (RFI) is also a key input to the Government's estimates of the aviation industry's external costs. BAA recognises that carbon dioxide is only one of a number of emissions that have an impact on climate change. The total climate change impact of an activity, taking into account the effect of all other emissions, can be expressed as a ratio between the total impacts and the impacts from CO₂ emissions alone, and is known as the radiative forcing index – put simply, it is a multiplier effect.
- 2.17 The Government's climate change cost estimates are based on a radiative forcing index of 2.7. The index value of 2.7 is the central IPCC estimate of the radiative forcing impact from aircraft at altitude. The IPCC report from which the central estimate is derived, highlights the range of uncertainty around aviation's 'true' RFI value.
- 2.18 Although BAA is not proposing an alternative RFI value, we note the degree of scientific uncertainty around the appropriate radiative forcing index to be used in estimating climate change impacts of aviation. This uncertainty should be recognised and accounted for in any estimates of the industry's climate change impacts. It should also be noted that the RFI of 2.7 represents an average value for current aircraft technologies and airline operating procedures. New technologies or changes to existing operating procedures could potentially reduce aviation's total climate change impacts.
- 2.19 It is clear to BAA that a significant degree of uncertainty exists around the key inputs to any estimation of the value of aviation's climate change impacts. As a consequence, there must also be a significant degree of uncertainty about the estimates of costs which derive from these estimates of impacts. It is probably not possible at present to be more precise with estimates of aviation's external costs, so we accept that the Government's analysis provides an indication of the possible scale of the industry's external costs associated with climate change, given a number of plausible assumptions.
- 2.20 However, the uncertainty about the scale of costs is extremely important, because if the policy measure selected to tackle aviation's contribution to climate change is one which seeks to monetise the value of the impact, the cost to the industry of meeting it could be disproportionate, compared with a policy measure designed to reduce the impact by the most cost-effective means. We discuss the policy options for in more detail in Section 3.

Noise

- 2.21 The Government's current estimates for the external costs associated with aircraft noise around UK airports are based on a study carried out by Pearce and Pearce (2000). The monetary valuations of noise attempt to place a value on annoyance and on the impact of quality of life. For all UK airports the study estimates that the value of noise impacts to be around £25 million a year, with the valuation of noise impacts around Heathrow dominating the total.
- 2.22 The Government concludes in the discussion paper (Section 3, para 3.22) that estimates in this area are 'less certain' than those for climate change. The Pearce

and Pearce study highlights the difficulties encountered in attempting to establish a generic value for the impact of aircraft noise.

- 2.23 The DfT is currently engaged in a long-term research project to establish attitudes to aircraft noise and the valuation of annoyance. BAA accepts that the findings of the ongoing study will inform Government policy towards aviation meeting the external costs associated with aircraft noise.

Local air quality

- 2.24 The discussion paper refers to research by CE Delft (2002), that seeks to establish an economic value for local air quality impacts. According to the CE Delft analysis, the value of local air quality impacts for UK airports could be between £119 million and £236 million per year. These values have been derived by multiplying passengers using UK airports in 2000 (180 million passengers) by the sterling equivalent of either one or two euros per passenger.
- 2.25 BAA believes that the CE Delft approach of using average, per passenger values for local air quality impacts is not appropriate for deriving a national estimate. Given the critical importance of the local context in which emissions occur, the value of aviation's local air quality impacts will vary airport by airport.
- 2.26 BAA further believes that the estimates for the costs associated with local air quality are, in any case, significantly overstated as a result of an incorrect interpretation of the CE Delft study. Although domestic passenger movements have both a landing and a take-off (LTO) in the UK, international passenger movements involve only half an LTO cycle at a UK airport. Consequently, it is incorrect to use the total number of passengers to calculate the total number of passenger LTO cycles at UK airports. To allow comparison with the DfT estimates, BAA has restated the local air quality estimates on the basis of per passenger per LTO cycles. On this basis, the range of local air quality costs would be around £70-£140 million per year.
- 2.27 Furthermore, the CE Delft research acknowledges that a significant majority of the local air quality costs are associated with health-based impacts. The EU's limit values for NO₂ and PM₁₀ are health-based standards, with the level having been determined using a precautionary approach. BAA is committed to meeting and respecting these air quality standards around its airports, and the costs associated with compliance will consequently be internalised by the aviation industry. We therefore believe that the external costs associated with aviation's contribution to local air quality impacts will be considerably lower than indicated by CE Delft's work.
- 2.28 It is also worth indicating here that the estimates of the air quality impacts of runway expansion that the Government published in its consultation paper *The Future Development of Air Transport in the United Kingdom: South East (SERAS)* are, in BAA's view significant overestimates.
- 2.29 The Government's modelling of air quality for the SERAS consultation identified only Heathrow and Gatwick as potentially sensitive sites in terms of air quality, specifically with regard to concentrations of NO₂. BAA recognises that the Government's analysis was based on the best available knowledge at the time, but nevertheless contained a number of limitations.
- 2.30 BAA commissioned detailed air quality work to address the level of uncertainty in the modelling, as well as the need to demonstrate how air quality impacts might best be mitigated. We have developed a revised model which is consistent with the overall SERAS approach but which we believe is more accurate in predicting future

concentrations of NO₂ in the local community. The results from this work are important because they offer a more accurate starting point from which to assess the benefits of alternative mitigation scenarios.

- 2.31 BAA believes that advances in aircraft engine combustion technology and modes of aircraft operation will reduce emissions of nitrogen oxide. Added to this, the provision of fixed electrical ground power and pre-conditioned air on aircraft stands, together with operational procedures designed to reduce aircraft taxi times and the increased use of cleaner-fuelled vehicles will all contribute to reduced emissions at airports. Our assessment is therefore that the Government model significantly over-predicts the number of people likely to fall within areas where the EU Directive limit for NO₂ would be exceeded.
- 2.32 It is important also to recognise that a significant proportion of pollutants in the vicinity of airports arise from road traffic in the surrounding areas, most of which is not related to the airports at all. In the case of Heathrow, only 15% of road traffic at peak times on the major trunk roads in the area is airport-related. BAA modelling shows a significant contribution of non-airport sources at those locations where air quality exceedences of forthcoming EU limits are predicted. Consequently, action to improve local air quality levels cannot solely rest with airports. A wider approach is required, bringing together the relevant influential organisations in the area concerned.
- 2.33 Clearly, as with climate change emissions, there needs to be confidence that the estimates of air quality impacts on which current and future external costs are based are reasonable and realistic, in order to ensure that the financial consequences on the aviation industry of addressing these impacts are fair and proportionate.
- 2.34 Details of the work BAA has undertaken with the Government's consultants during the consultation period to investigate the air quality effects at the three main BAA South East airports can be found in BAA's response to the consultation, 'Responsible Growth', published on 12th May 2003. This, and technical reports by AEA Technology, is available on our website at www.baa.com/consultation.

Other impacts

- 2.35 Like the Government, BAA has not sought to calculate the external costs associated with other possible environmental impacts. This is because we believe that the external costs of the remaining impacts – biodiversity, ecology, water quality, waste, heritage, road congestion – are fully internalised within the development and operating costs of aviation through the planning system. In the case of road congestion, where the primary environmental impact is emissions of nitrogen dioxide, it is also captured through the cost internalisation in road transport, paid for by users.

Does aviation cover its external costs?

- 2.36 Given the uncertainty discussed above about the exact scale of aviation's external costs, it is not possible to say whether the aviation industry is fully covering those costs. However, there is one very large cost which has been imposed on the industry which contributes very substantially to the internalisation of air transport's costs – Air Passenger Duty (APD).
- 2.37 APD is levied on all departing passengers, ranging from £5 for an economy-class domestic passenger, to £40 for a business-class long-haul passenger. It currently

raises around £900 million a year for the Exchequer. BAA would welcome an acknowledgment by the Government that APD makes a significant contribution to the covering of external costs by aviation.

- 2.38 To this cost must be added the cost of investing in environmental mitigation measures by airports and airlines, including the substantial investments in public transport, noise mitigation and new aircraft. These costs are already internalised in the charges airports and airlines make to passengers.
- 2.39 However, there is a body of opinion which claims that the external costs of air travel are considerably higher than is set out by the Government. In recent months, figures of £3 billion, then £6 billion, £9 billion and £11 billion have been claimed, variously, by pressure groups as the 'true' external cost of aviation. BAA rejects these figures, which we believe have no sound economic basis.
- 2.40 Pressure groups have made a number of claims, assumptions and calculations to reach these inflated figures, including
- aviation should pay fuel duty at the same level as a private motorist (ignoring the fact that the substantial cost of aviation infrastructure is already covered in the ticket price, unlike the cost of road infrastructure, which is free to motorists at the point of use)
 - aviation should pay VAT on air tickets (no other form of public transport pays VAT on fares)
 - aviation should pay VAT on fuel (double-counting, if VAT should be paid on tickets)
 - aviation should pay an environmental tax to cover its environmental costs (double-counting, if these costs are already covered by fuel duty)
 - passengers should pay duty on all purchases, abolishing the duty free concession they enjoy (even though duty free encourages discretionary purchases, and does not stimulate additional demand to travel).
- 2.41 BAA would support a rigorous analysis of the external costs of the whole transport industry and any tax concessions or subsidies that all forms of transport enjoy, on a fair and equitable basis. BAA would expect the Government to conduct such an analysis before imposing any additional costs on aviation to ensure that there is a level fiscal playing field, and ensuring that any fiscal or policy instruments meet the tests of fairness and equity.
- 2.42 In support of such an analysis, BAA would make the following points:
- while aviation does not pay fuel duty at the rate of private motorists, neither does rail (which pays heavily discounted red diesel fuel duty) or buses (which receive a substantial fuel duty rebate), or shipping (which is also exempt). BAA welcomes the statement by the Parliamentary Under secretary of State for Transport, David Jamieson MP, in reply to a Parliamentary Question about imposing a fuel tax on aviation at a rate equivalent to that for unleaded petrol: "Imposing such tax increases on aviation would consequently go well beyond what was justified on the basis of evidence of its environmental costs."
 - aviation is the only public transport mode to pay an activity tax (Air Passenger Duty), as an alternative to a fuel duty
 - domestic aviation pays the climate change levy, while rail is exempt

- no form of public transport pays VAT on its tickets
- aviation receives very little in terms of direct Government spending, compared with other forms of transport, funding virtually all its own operations and infrastructure. In the last four years, of £35.9 billion of public spending on transport, aviation received £199 million (partly to support life-line Highlands & Islands air services in Scotland), roads over £19 billion, buses almost £7 billion, rail almost £6 billion, London transport £2 billion and water transport £500 million. The ten-year transport plan identifies £180 billion of public spending on transport, none of which is earmarked for aviation.

2.43 Opponents of air travel also sometimes cite as evidence that aviation is not covering its external costs and is economically, as well as environmentally unsustainable, the existence of low air fare deals, where a one-way international flight can sometimes be bought for as little as £10. This is a facile argument, for a number of reasons. First, only a handful of seats are sold at such low prices, acting as loss-leaders to attract customers to the airline offering the promotion. Once these seats are sold, the price increases substantially. Second, such low fares do not include airport charges and taxes, which have to be paid in addition to the fare. Since the cost of airport environmental investment is included in the airport charge, and Air Passenger Duty substantially covers the cost of emissions, passengers lucky enough to secure £10 air fares are actually significantly meeting the external costs of their flight. Third, low-cost airlines are among the most profitable in the industry, and are clearly economically sustainable.

3. Instruments for tackling environmental impacts

3.1 BAA believes that the range of policy instruments available to Government and the aviation industry provides the potential for fully addressing the environmental impacts of air travel, thereby internalising and meeting the costs discussed in Section 2. This range encompasses measures which can be applied at a local, national or international level, and include:

- voluntary action to improve environmental performance
- planning controls
- national regulatory policies and standards
- international regulatory policies and standards
- economic instruments.

Voluntary action

3.2 Airports and airlines pursue many actions to reduce the impact of their activities on the environment. BAA believes that such voluntary action is to be encouraged, as Government intervention should only occur in a situation where the market is failing to secure the desired objective. This approach not only accords with the Government's objective of intervention only where necessary, but it is most likely to avoid market distortions. Many measures have been adopted unilaterally, and several have been adopted under binding agreements which airports have entered into with local authorities. Examples of voluntary action designed to tackle the impacts are set out below.

Noise

3.3 To tackle noise, airports, airlines and air traffic control have adopted the following measures, which all internalise the costs of noise impacts and have contributed to a substantial reduction in the number of people affected by aircraft noise (for example, from 2 million at Heathrow in 1980 to 300,000 in 2000):

- investment by airlines in modern, quieter aircraft fleet to reduce noise at source
- a voluntary ban on scheduled QC4 night movements at Heathrow since 1996 and at Stansted since 2000
- arrival/departure procedures at all three South East airports to minimise the noise of aircraft at landing and take-off
- departure track-keeping trials at Stansted airport to ensure aircraft keep to noise preferential routes in order to limit noise impact on the ground to areas beneath those routes
- promotion of 'continuous descent approach' procedures which reduce noise from arriving aircraft
- as far as possible consistent with flight safety, no use of reverse thrust on landing at night at all three South East airports
- measures to constrain high-power engine running at all three South East airports
- fines for infringements of the noise limits by departing aircraft at all three South East airports, with revenues hypothecated to fund community projects
- day and night time differential landing fees according to aircraft noise categories at all three South East airports to encourage airlines to use quieter aircraft
- voluntary noise insulation schemes at Heathrow and Stansted
- restrictions on the use of aircraft engine ground power sources at all three South East airports and the promotion and provision of fixed electrical ground power on new, fully operational stands.

Air quality

- 3.4 To tackle air quality, airports, airlines and air traffic control have adopted the following measures to reduce emissions of pollutants at source:
- investment by airlines in modern, cleaner aircraft which consume less fuel and therefore make fewer emissions
 - investment by airports in fixed ground power units, to enable aircraft auxiliary power units to be switched off while on stand
 - investment by airports and airport-based businesses in low emission vehicles
 - investment by airports and airport-based businesses in public transport alternatives to private car use for passengers and staff
 - improved procedures to reduce aircraft taxiing times between push-back from stands and take-off
 - improved procedures by airlines to use reduced thrust on take-off.

Planning controls

- 3.5 Planning conditions placed upon developments, either by local authorities or by the relevant Secretary of State following a public inquiry, are effective mechanisms for addressing the environmental impacts of aviation at a local level. The main impacts addressed by local planning conditions are noise, air quality, road congestion, water quality, waste, biodiversity, ecology and heritage.
- 3.6 Airports incur costs in complying with these planning conditions, which are then remunerated by airport charges at a level which is higher than would otherwise have been the case. This process ensures that a significant degree of local impacts and external costs are already internalised by the planning system.
- 3.7 By way of illustration, for Heathrow Terminal 5 the costs of compliance with planning conditions for tackling noise (such as the 145km² 57dB Leq noise contour), air quality, rail access improvements (such as the Heathrow Express and Piccadilly Line extensions) and improved motorway access to the airport run into hundreds of millions of pounds. These costs are passed on to airlines and their passengers.
- 3.8 BAA believes that local planning conditions, backed up by national and international standards, should continue to be a primary control on local environmental impacts.

National regulatory policy and standards

- 3.9 The Government has a number of national regulatory policies, standards and controls at its disposal to direct the aviation industry to achieve a satisfactory level of environmental performance and thereby address its impacts. Within the constraints of its international obligations, the Government has a degree of latitude to determine controls at standards higher than might pertain in other countries, particularly to deal with the impacts of noise and air quality.
- 3.10 Where noise is concerned, the Department for Transport has established statutory controls over the minimum standards that must be applied at several airports, including Heathrow, Gatwick and Stansted. These controls relate to the maximum noise level that an aircraft is permitted to make on departure during the day and night, the routes an aircraft must take on departure, the height an aircraft must reach before departing from the 'noise preferential route', the hours of operation of the airport.

- 3.11 Where air quality is concerned, the Government has established air quality objectives to be implemented in 2005 under the UK Air Quality Strategy published in 2000. BAA believes that emissions from aviation should not cause people to live in areas where the quality of air is unacceptable, and we recognise that statutory air quality limits need to be met and respected.

International regulatory policy and standards

- 3.12 As air transport is a global industry, it is appropriate to address some environmental impacts at an international level. Noise, air quality and climate change emissions are all impacts where international action is required.
- 3.13 International standards determine the noise classification of aircraft, and international regulations have successively tightened aircraft noise standards. In 2002, for instance, Chapter 2 aircraft (the noisiest flying at the time) were banned by the EU from operating from EU airports, which has significantly improved the noise climate around airports. Compliance with this regulation has involved costs for airlines in renewing their fleet, and these costs have been internalised in fares.
- 3.14 International engine emissions certification standards for aircraft are an important mechanism for reducing air quality impacts at source. EU-wide air quality limits are also coming into force in 2010, which will require action to be taken across Europe to ensure that citizens are not exposed to concentrations of pollutants above proscribed levels. Where airports, airlines and other users contribute to potential exceedences of these new limits, they will have to take action to help bring the concentrations down to permitted levels, again at costs which will be internalised and passed on to users.
- 3.15 BAA believes that more stringent standards for aircraft manufacture should continue to be introduced, especially for noise and NO_x emissions, through the Committee on Aviation Environmental Pollution (CAEP) and through the International Civil Aviation Organisation (ICAO). BAA and other UK airports are, for instance, lobbying for more stringent international controls on noise at source. We believe that the following proposals are both realistic and technically achievable:
- The phase out of all marginally compliant Chapter 3 aircraft by 2006
 - The complete phase out of all remaining Chapter 3 aircraft no later than 2015 with the simultaneous introduction of a new Chapter 5 (equivalent to at least Chapter 3 minus 14dB)
 - The introduction of yet more stringent rules by no later than 2030, together with the accompanying phase out of Chapter 4 aircraft.

Economic instruments

- 3.16 Economic instruments can be important policy tools for providing signals which can influence the behaviour of consumers and the aviation industry and, if they are smart economic instruments, can effectively target resources and action at dealing directly with environmental impacts. There are three key economic instruments at the disposal of Government:
- taxes
 - charges
 - market mechanisms, such as trading schemes.

Taxes

- 3.17 There is a role for taxation in industry, to raise revenue for the Exchequer which can then be allocated to fund Government policy priorities, such as education, health and welfare, and BAA is supportive of this. BAA pays corporation tax on its profits and national insurance, our employees pay income tax and national insurance, and the majority of our customers pay VAT on the goods and services they purchase at retail outlets at our airports.
- 3.18 However, the issue of taxation as an instrument for tackling environmental impacts is more complicated, and this is where the tests set out in Section 1 are important. As has already been stated, BAA does not support instruments which simply capture the value of an impact, such as through a tax, and leave the impact itself unaddressed. Blunt taxes, which are not targeted at the impacts, where the revenues flow to the Exchequer and are not hypothecated back into reducing or mitigating the impact, are therefore undesirable economic instruments.
- 3.19 Air Passenger Duty is an example of a blunt tax. It was introduced in the absence of aviation fuel duty, to capture external costs which were not then being met. However, while it has increased the cost of flying (by £900 million a year), the revenue generated by it has not been applied directly to tackling the climate change or air quality impacts of aircraft fuel burn. It therefore fails at least two key tests – it is neither effective nor hypothecated.
- 3.20 BAA believes that the substantial revenue generated by APD must be included in any assessment of the extent to which air transport is currently meeting its external costs. Moreover, since APD is ineffective, the Government should turn its attention to developing other, more effective instruments. In the meantime, BAA does not believe that APD should be increased. Any external costs which are not currently being captured should be captured through smarter policy or economic instruments which will be effective in addressing the impacts. Once effective economic instruments are in place, APD should be abolished, to ensure that the aviation industry does not pay more than once for its impacts.
- 3.21 If one of the aims of an economic instrument is to send powerful price signals to the industry to co-ordinate innovation and research and to encourage investment in new technologies, then blunt taxation is unlikely to be effective. Part of the reason for this is that the scale of costs which needs to be covered is not sufficiently large that it would act as a significant spur to innovation, while a tax large enough to encourage innovation may be disproportionate to the scale of the impact.

Charges

- 3.22 A charge, if directed at an impact, may also have a role to play in the package of measures available to Government and the aviation industry. Charges related to aircraft emissions, for instance, may encourage the faster take-up of lower-emissions technology, and provide a clear incentive to airlines to accelerate the replacement of older aircraft with more modern, cleaner aircraft.
- 3.23 Charges are not necessarily to be applied by Government nationally. BAA, for instance, charges airlines for using its infrastructure and varies an element of its charges to airlines depending on the noise generated by each aircraft, with lower charges for quieter aircraft and premiums for the noisier aircraft. BAA has also consulted airlines on the introduction of a variable in its charges relating to emissions, to reward the cleaner aircraft and penalise those which are more polluting. Congestion charging, imposing road user charges to tackle local traffic congestion, is another example.

- 3.24 Charges may be more effective than a blunt tax, if applied at the appropriate level. However, in the case of the airport charging regime at BAA's regulated airports, there is no new stream of revenue to be hypothecated to reducing impacts, as charges are capped by the regulator. What BAA is seeking to do is providing price signals within a charging system which, in total, is revenue neutral, to encourage quieter and cleaner aircraft in order to reduce noise and pollution in the local area.

Market-based instruments

- 3.25 Market-based instruments offer the greatest potential among economic instruments for effectively addressing the environmental impacts of aviation. The most prominent example of a market-based measure is a trading scheme, whereby an agreed standard or environmental impact limit is set and a free trade is then established in permits for that impact. The price of the permit is determined by the market, rising with demand as supply becomes scarce.
- 3.26 A clear advantage of a market-based mechanism over a measure based on an administrative estimate is that the market will tend to deliver the lowest-cost outcome, passing the key test of economic efficiency. The long-term price signals established by the market will also allow airports, airlines and manufacturers to evaluate their potential investments and the operational measures needed to address the environmental impacts with greater certainty.
- 3.27 Economic instruments based on administrative estimates, on the other hand, may distort industry behaviour unless they are set at a level which mimics the market's valuation of the external cost. Moreover, estimates set by Government would be less predictable over the long-term and, if they are used to establish a tax or charge to provide a revenue stream, could be vulnerable to periodic increases to support general revenue raising, rather than to reflect costs.
- 3.28 Emissions trading is the most well-known trading scheme. BAA believes that emissions trading is the most appropriate instrument for addressing aviation's climate change impacts. As climate change impacts are global, the appropriate level for action to tackle it must be global. Under an environmentally-credible, open and international emissions trading system, companies and industries would have their emissions capped within agreed levels, but would be able to trade credits with other companies and industries, domestically or internationally.
- 3.29 By setting the quantity of emissions at a level which is consistent with the Earth's carrying capacity for greenhouse gases, and allowing the market to determine the use of the permits, the trading system will ensure that emissions are contained within the agreed cap in a way which maximises economic welfare. Emissions trading would not be costless to aviation, as airlines would have to purchase credits or invest in new fleet technology. These costs would, however, be minimised and the revenues would be directed, via the trading of permits, to where they would be most effective at reducing emissions. This makes emissions trading a solution which has both environmental and economic advantages.
- 3.30 BAA believes emissions trading can deliver three important outcomes. Firstly it will deliver innovation in the achievement of environmental results. Experience from the US sulphur dioxide trading scheme shows that it cut emissions further, faster and more cheaply than had been expected. As a result, the US has made significant progress towards achieving its target of a 50% reduction in emissions by 2010.
- 3.31 Secondly, it will deliver greater stability and certainty for business. It would give business a long-term framework in which to consider investments and operational improvements. Given the lack of alternative aviation technologies on the horizon, the long-term consequence of not allowing emissions trading could be to constrain growth or increase costs disproportionately and send the industry into decline.

- 3.32 Thirdly, it will enable responsible growth. Emissions trading will deliver a responsible quality and quantity of growth. BAA considers this to be the right approach to demand management, within the context of sustainable development. That is, demand management not for its own sake, but only to the extent necessary so that aviation plays its part in reducing the overall quantity of emissions produced.
- 3.33 Emissions trading is seen by many as the right approach to tackling global climate change, and there is support for it across Government, business, and NGOs. However, many stakeholders are wary of the time it will take to implement, and some even question whether it can be implemented, given the complexity in developing and implementing a scheme for aviation, and the international obstacles and resistance that will be encountered. BAA certainly does not see the pursuit of a credible emissions trading scheme as a ploy for postponing the day when aviation will have to deal with climate change, and calls on the Government to use its influence internationally, especially within the EU and the USA, to ensure that a scheme is established as quickly as practicable.
- 3.34 Moreover, recognising the need to make progress on the emissions trading issue, BAA has launched an initiative designed to push this agenda forward. In March 2003, BAA hosted a major stakeholder workshop on the potential role of emissions trading in delivering sustainable aviation. This initiative brought together over 50 senior representatives from government, business, and NGOs, in order to build high-level interest in bringing aviation within an international emissions trading regime. While most participants were from the UK, a number of stakeholders came from across the EU and the USA.
- 3.35 The workshop was independently facilitated and aimed to establish the key characteristics of a credible emissions trading regime for aviation, and identify a range of stakeholder views and priorities. The report of the workshop sets out indications of how Government, industry and NGOs see emissions trading being developed and implemented, highlighting key areas of agreement and disagreement on some of the various contentious design issues.
- 3.36 These issues include the level of the emissions cap, whether to favour an EU or international scheme, whether to take a 'CO₂ only' or a 'total climate change impact' approach, and the right balance between permit auctioning and grandfathering. BAA is currently in the process of developing its own thinking on all of these areas, but it is clear that other effects must be addressed, either directly through emissions trading or through separate instruments, for the approach to have environmental credibility.
- 3.37 BAA recognises the concerns expressed by some Government and NGO representatives that some approaches to emissions trading are environmentally credible, while others are not. We have therefore taken great care to be transparent, inclusive, and accountable, working with the grain of stakeholder thinking.
- 3.38 Together with external stakeholders, BAA has established a emissions trading steering group to take forward the output from the workshop. The steering group has now commissioned expert consultants to work on the detail of a emissions trading system, building on the outputs from this workshop. The consultants are considering the impact of an environmentally credible approach to emissions trading on the aviation industry, and identifying the key political and institutional steps necessary to implement emissions trading. BAA is planning a high-profile seminar in Autumn 2003 at which progress with this work will be reported back to the wider group stakeholders.
- 3.39 In summary, BAA is firmly and genuinely committed to the objective of developing an emissions trading regime which includes aviation, and we believe that aviation's inclusion in an intra-EU scheme must be the first milestone. We call upon the

Government to show leadership and take action to encourage international co-operation to establish a credible scheme, both within the EU and globally.

Interim measures

- 3.40 BAA recognises that it will take considerable time to develop and implement an international emissions trading scheme. In the period before a trading scheme is operational, we accept that it may be appropriate for Government to consider interim measures for internalising the external costs associated with climate change.
- 3.41 Such measures would need to be assessed against the key tests we set out in Section 1, and there should be an explicit commitment to removing the instruments once emissions trading is established. Perhaps most importantly, interim measures should not undermine efforts to implement the preferred long-term solution, by introducing international competition issues into negotiations for the emissions trading scheme.

Implementing economic instruments

- 3.42 In considering the introduction of economic instruments it is important to allow the industry time to adapt to the new framework of incentives. When airlines are purchasing new aircraft fleets, they are making long-term investment decisions. Immediately imposing high levels of duty or tax to affect behaviour could not therefore lead to any short- or medium-term behaviour change, and would be likely only to impose significant economic costs on users and society as a whole. The Energy White Paper already establishes the important principle that putting industry on a path to achieving long-term environmental objectives is more important than rapid, or one-off improvements.
- 3.43 The Government should be mindful of the potential impact of the way in which it implements any economic instrument within the aviation industry. Before introducing an instrument, it should seek to understand these impacts fully, and design the instrument so that it maximises the positive benefits and minimises negative consequences.
- 3.44 BAA is therefore disappointed that Government has not included an assessment of potential economic instruments in its discussion paper. The document does not consider the key criteria for economic instruments, including their environmental effectiveness, the costs of intervention, the impacts on competitiveness, the institutional obstacles to introducing economic instruments.
- 3.45 Given the Government's commitment to understanding these issues before making decisions on economic instruments and environmental taxation, BAA would expect this sort of analysis to be carried out after the White Paper is published. At this stage, without an evaluation of the impacts, we would not expect Government to be specific or definitive about the economic instruments or the other mechanisms it intends to implement. We would expect this to be part of a more detailed consultation process in the due course, following the publication of the Air Transport White Paper. BAA is committed to playing a full part in the policy development process.

4. Net external costs

- 4.1 Within the accepted environmental limits, BAA believes that a study of external costs should assess environmental costs within a broader context which also includes economic and social costs and benefits. This is in order to understand the role that aviation plays in the wider economy and society and therefore to ensure that the implementation of measures targeted at a specific environmental impact do not have disproportionate consequences for the economy or society as a whole. The Government should therefore have an understanding of the net external costs of aviation as it considers the most appropriate policy instruments.
- 4.2 Britain has developed a competitive advantage in air services over neighbouring European countries, and has built an aviation industry which is arguably the best in the world. Aviation is a substantial industry in its own right. According to research by Oxford Economic Forecasting (OEF), published in 1999, UK aviation directly employs 180,000 people across a wide range of jobs, from cleaners to engineers, caterers to pilots. It is also a significant investor. BAA alone has invested over £5 billion since 1987 and will be investing a further £8.9 billion in the UK over the next 11 years.
- 4.3 The Government should therefore be cautious about introducing measures in the UK alone and which could therefore undermine the competitiveness of UK aviation. Unilateral action by the UK Government to ensure that aviation covers its external costs which damages UK aviation's competitiveness could cause disproportionate impacts in terms of jobs and investment, and could have little or no beneficial effect if the environmental impacts are simply transferred to countries where action has not been taken.
- 4.4 OEF's research also calculated that aviation helps support some 380,000 other jobs throughout the economy and, in 1998, contributed around 1.4% of GDP or £10.2 billion in value-added to the economy. In the SERAS consultation document, the Government estimates the net economic benefits from developing air transport in the South East alone could be as high as £18 billion in net present value terms. The Government also suggests up to 80,000 additional direct and indirect jobs could be created by 2030. Overall, it is plain that the responsible growth of aviation is crucial to the achievement of high and stable levels of economic growth at national, regional and local levels.
- 4.5 Crucially, aviation supports those high-productivity sectors of the UK economy on which the country's future prosperity depends. More specifically, high-knowledge and high value-added activities such as electronics, pharmaceuticals, biotechnology, research and technology, insurance, banking and finance, business activities and communication, in which the UK is globally competitive, are aviation dependent. These sectors either depend on aviation for shipping or receiving a significant proportion of their goods, where just-in-time production and freight services are important, or are activities which are high-intensity users of international travel, such as service sector companies whose staff travel abroad regularly.
- 4.6 These industries, being low-impact and internationally mobile, could locate anywhere that offers skilled labour and good access to global markets. Policy measures which increase the cost of air services to and from the UK could affect the competitiveness of these crucial industries disproportionately to the cost of the environmental impact being tackled.
- 4.7 As a result of the dependence on aviation by high-value industries, aviation accounts for over 30% of cargo by value, though just 5% by weight, worth more than £50 billion a year.

- 4.8 Aviation also plays a critical role in supporting direct inward investment to the UK and its regions, and in attracting global and European headquarters operations to the UK. Almost 30% of the largest companies in Europe have headquarters in the UK, compared with 18% in France and 16% in Germany, while in 2001, the UK accounted for almost a fifth of all foreign direct investment in the EU. Partly, this is due to history, language and culture, though it is also partly due to the international connectivity that the UK is able to offer. Measures which increase the cost of that connectivity may, where the decision to locate in the UK hangs in the balance, play a contributory role in that decision-making.
- 4.9 Aviation opens up the UK's regions to markets and business opportunities abroad, either through direct regional air services or via connecting services provided at London's hub airport system. Such access is critical to the attractiveness and competitiveness of the UK's regions which, in a European context are geographically peripheral, and therefore have competitive disadvantage compared to regions on the Continent.
- 4.10 Aviation is also critical to tourism. In 2001 there were 22.8 million overseas visitors to the UK, 70% of whom arrived by air. The UK is number five in the world league of tourism earnings, and tourism is a major component of the modern UK economy, accounting for some 4 to 5% of UK GDP and sustaining around 7% of all jobs, many of them associated with the vibrant outbound travel industry. Inbound tourism is highly price-sensitive, as the UK is only one possible destination for overseas tourists, who can choose to go to another country if the cost of visiting the UK increases through the implementation of measures which unilaterally increase the cost of air travel. Outbound tourists, however, are less price sensitive, as they will still choose to travel abroad to visit friends and relatives or take a holiday in a country with a more congenial climate than the UK is able to offer. Any measure which imposes unilaterally higher costs on UK air transport is therefore likely to widen the tourism deficit in the balance of payments.
- 4.11 And aviation has a role to play in contributing to the social dimension of sustainable development. Aviation provides people with the opportunity to experience other cultures, to maintain social networks by visiting friends and relatives, and by giving people the ability to take holidays in the UK and abroad, it promotes a sense of well-being. The social benefits of air travel are difficult to value in economic or financial terms, but in a modern society that values leisure and freedom of movement, they are likely to be substantial.
- 4.12 Potentially, over time, air transport could account for an increasing proportion of the UK's global environmental impact. However, as long as these impacts are managed within internationally agreed limits, the positive social and economic impacts that result from aviation could mean that the country's overall net position may actually improve significantly as a consequence. Aviation can claim to be regarded as a premium user of the earth's environmental capacity, and its development should be encouraged, compared to other potential users with equal (or higher) impacts but lower net benefits.
- 4.13 In considering the range of policy instruments, the Government should therefore take full account of the potential impacts on the competitiveness and productivity of the UK aviation industry, and the UK's regional and national economies, as well as the impacts on regional economic and social peripherality.