

Towards greener skies: The surprising truth about flying and the environment



easyJet plc

Introduction

There is no doubt that climate change is a real and imminent danger which should be a concern for us all. We must take responsibility – as individuals, corporations and governments to take intelligent and well thought-out actions to ensure we leave the planet in a good shape for generations to come.

easyJet recognises that flying is one of a number of industries and activities which releases CO2 and other greenhouse gases, which contribute to climate change. As such, it is important that mechanisms are put in place to ensure the aviation industry develops in a way that is environmentally and economically sustainable and to ensure that measures for aviation are proportionate with its impact on climate change.

According to The Stern Review: The Economics of Climate Change¹, aviation CO2 emissions are responsible for 1.6% of global greenhouse gas emissions, which are projected to rise to 3-5% by 2050 (if there were no substantial developments in technology – of which more later). This clearly justifies a focus on aviation emissions, but it is a much smaller contributor than, for example, power generation which accounts for 24% of global greenhouse gas emissions or land use (including deforestation) which accounts for 18%. This shows the need for a balanced, proportionate debate to ensure that the 98% of emissions that come from other sources are not ignored in favour of the 2% from aviation.

That said, neither **easyJet** nor the aviation industry can be complacent about their climate change obligations, and will need to work to improve environmental efficiency. Today's aircraft are typically 70% cleaner and 75% quieter than their 1960s counterparts. The world's aerospace companies are working on technology that would lead to a major step forward by 2020 (the so-called ACARE targets²) and a similar level of improvement thereafter which could result in **total** CO2 emissions from air travel being less in 2050 than they are today – even accounting for the growth in passengers and flights.

To achieve this ambition will involve a substantial effort by the aviation industry – and an equally impressive effort by governments and regulators. Legislation should be enacted that incentivises airlines and consumers to fly as efficiently as possible, using ever-cleaner aircraft. Similarly, airlines must be discouraged from flying older, dirtier aircraft. This would be a common sense approach and would mirror the major improvements that the industry took to reduce noise emissions over past decades.

Clearly, environmental instruments need to be effective (and seen to be). The inclusion of aviation into the EU Emissions Trading Scheme (ETS) provides the appropriate kind of framework – a wide-scale market-based mechanism that would result in passengers paying more to fly on dirty aircraft.

By contrast, the UK's current Air Passenger Duty (APD) can be considered a poor environmental tax. It is flat-rate, so those choosing to fly on the cleanest aircraft pay the same as those choosing the dirtiest; economy passengers on a 3-hour flight to Marrakech pay the same as those on a 24-hour flight to Melbourne; no tax at all is paid on 40% of the emissions from UK flights (as attributed by DEFRA); and the proceeds are not used for abatement, or put back into the industry, or spent on scientific research into ever-cleaner aircraft technology.

The UK, despite its status as a trade-reliant multicultural island, taxes aviation more heavily than any other European country and more heavily than any other form of mass transport.

That aviation does not pay tax on fuel or VAT on tickets is not unique in the UK – no comparable cross-border form of transport pays tax on fuel and no other form of transport pays VAT on tickets. The other European countries that levy VAT on domestic air tickets do not have an equivalent tax to APD. Yet, there is still a general belief that there should be higher taxes on flying. Much of this can be considered a common desire amongst Governments to raise tax revenues, but many have argued that aviation should “cover its full environmental costs” – ergo, that it doesn't already.

But, actually, aviation does cover its full carbon costs, as shown by Government evidence. The UK Department for Transport recently issued a consultation paper³ which suggests that its central assumption is that aviation does cover its carbon costs already, that is, the tax revenue from APD is twice the carbon cost of flying (even using a high multiplier the Government data still suggests that aviation covers its costs). And this aggregate figure masks significant differences across airlines - **easyJet for example covers its full carbon costs four times and on some routes, such as Liverpool to Belfast, 12 times.**

¹ The Stern Review: The Economics of Climate Change. Published by HM Treasury, December 2006
² The Advisory Council for Aeronautics Research in Europe (ACARE), launched at the Paris Air Show 2001
³ UK Department for Transport: Consultation on the Emissions Cost Assessment; August 2007

Examples like this demonstrate the need for Governments to devise laws and taxes that incentivise the right kind of behaviour rather than simply reflecting uninformed perceptions. If Governments can get this right, they will ensure that the tax burden falls hardest on those airlines which pollute the most, incentivising both airlines and passengers to be as efficient as possible.

Not having the right incentives in place risks both the environmental, but also economic and social outcomes. It penalises people who take environmentally-efficient flights, and subsidises those who don't. It unnecessarily increases the cost of travel and risks damage to an industry that provides around 200,000 jobs directly and contributes around £11 billion directly to the UK economy.

There is an intelligent way to balance aviation's contribution to climate change with its economic and social importance. As the proposals on the back cover show, it is about adopting a combination of rewards (aircraft that pollute less, pay less) and penalties (banning old aircraft) to incentivise green behaviour, to support local communities and to get the next generation of cleaner aircraft into our skies as soon as possible.

Aviation and climate change: Keeping the plane in perspective

A brief overview of the science of climate change

The Earth receives energy from the Sun in the form of radiation, about 30% of which is reflected straight back into space. The remaining 70% is absorbed, warming the land, atmosphere and oceans. This heat is ultimately radiated back out to space as infrared radiation. The effect of greenhouse gasses is to reduce the infrared radiation loss. The major natural greenhouse gases are water vapour, carbon dioxide (CO2), methane (CH4) and ozone (O3).

Human activity changes the climate's natural balance of greenhouse gases primarily through release of CO2. The Intergovernmental Panel on Climate Change also lists CH4, Nitrous oxide (N2O), Tetra- and Hexa-fluoroethane (CF4, C2F6), Sulphur Hexafluoride (SF6) and fluorocarbons such as HFCs and CFCs as man-made greenhouse gasses. All of these gases remain in the atmosphere for a long time (decades) and are covered by the Kyoto Protocol.

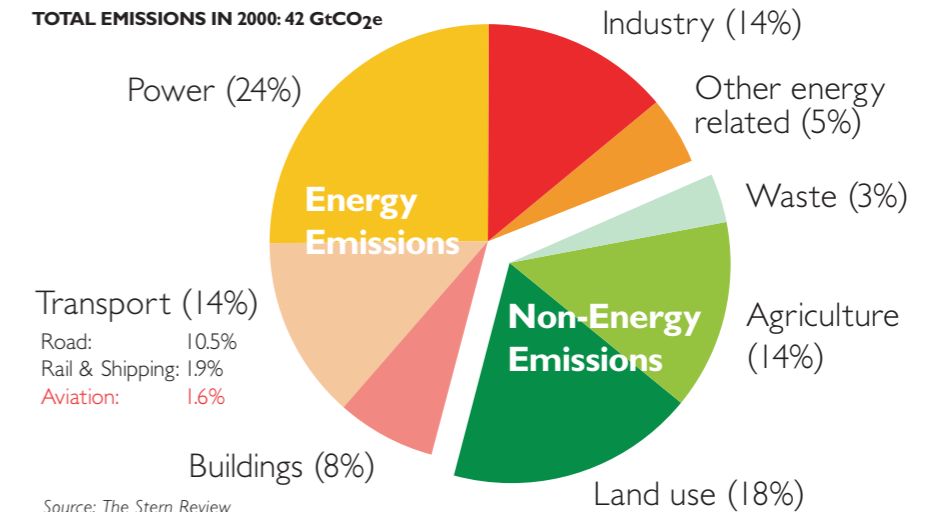
CO2 is the principal emission of airlines (the quantity of which can be derived from fuel burn) and its environmental effect is well understood. Aviation also emits water vapour (which can form contrails), nitrogen oxides (NOx) that enhances the formation of O3 and destroys CH4 and substances that trigger the generation of aerosol particles or lead to changes in natural clouds.

Aviation: a relatively small contributor to climate change

Calculating the exact emissions of a global industry operating across 190 countries recognised by the International Civil Aviation Organization is a complex business and one that very few organisations or individuals have undertaken with any degree of rigour.

It is for this reason that **easyJet** cites The Stern Review: The Economics of Climate Change, commissioned by the United Kingdom's HM Treasury and published in December 2006. According to its author, Sir Nicholas Stern, CO2 from aviation globally accounts for 1.6% of global greenhouse gas emissions (see chart).

Disaggregating this to the level of an individual country is also difficult. The United Nations Framework Convention on Climate Change is still working on the subject but there is currently no agreed methodology for assigning the emissions of international aviation to individual states. However, the UK government calculates the emissions related to the uplift of aviation fuel from UK airports as equating to 6.3% of the UK's CO2 emissions.



Taken either at a global or a national UK level, aviation CO2 is therefore a relatively small contributor to the emissions that are commonly associated with climate change. Statistically, grounding every airline in the world would, therefore, have only a small impact on global CO2 emissions.

The “CO2 at altitude” myth

One popular misconception is that aviation CO2 is more damaging because it is emitted at altitude.

According to the Intergovernmental Panel on Climate Change, because CO2 has a long atmospheric residence time (≈100 years) and so becomes well mixed throughout the atmosphere, the effects of its emissions from aircraft at altitude are indistinguishable from the same quantity of CO2 emitted by any other source.⁴

The problem with CO2 multipliers

As outlined above, aviation is responsible for other emissions. It is for this reason that some have argued that aviation emissions should be subject to a multiplier to reflect its non-CO2 effects. However, many of the leading scientists in the field now consider that radiative forcing (or a simple multiplier) is not the correct metric to model the non-CO2 effects of aviation. More specifically, the non-CO2 effects of different flights are not the same – the season, time of day, geographic location, altitude and duration of a flight will all influence the non-CO2 effects of the flight and these effects can only last for a short time (instead of decades for Kyoto gases).

As Professor Keith Shine, Department of Meteorology, University of Reading wrote on carbon offset schemes in a letter to the Guardian on February 24th 2007:

“The issue of RFI [radiative forcing index] is a really fractious one..... and most of those that have researched it have concluded that it is a horrible misapplication of science, and misusing something that was presented in an IPCC report in 1999 (although to be fair, the authors of that report contributed to the mess, via a lack of clarity!).”

“We make two points: 1: For any consistency with the way the Kyoto Protocol is implemented, the RFI would be pretty near one (so I am impressed with carbon neutral!) and 2: For consistency and equity, if an RFI is applied to aviation, then RFIs should be applied to all other energy emitting sectors, as they all emit the non-CO2 climate gases that are the cause of RFI being different from one.”⁵

easyJet therefore considers the use of a simple radiative forcing multiplier as clearly inappropriate and misleading when considering the non-CO2 effects of aviation, as it does not reflect differences in the lifetimes of effects, cannot accommodate the variance in the non-CO2 effects of aviation between flights and it tends to exaggerate the climate impact of aviation emissions.

Several concepts for including the non-CO2 effects of aviation are currently being discussed in the scientific community, which, at an aggregate level, would give a ‘multiplier’ between 1.1 and 1.2 for global aviation⁶ (later in this paper we use a multiplier of 1.9 to emphasise a point in regard to the “full environmental costs of flying”, notwithstanding that we disagree with the principle).

“We have the technology. We have the capability” Cleaner engines and lighter aircraft are the answer

Aviation by 2050: 3 times bigger 4 times cleaner

Today’s aircraft per passenger kilometre are typically 70% cleaner and 75% quieter than their 1960s counterparts⁷, which means that they can fly over three times as far for the same amount of fuel (and therefore emissions). Even faster technological advancements are being planned now, that will have a greater beneficial effect over the next 40 years. This will dramatically reduce the climate change impact of aviation and it is vital that people understand the implications of this technological progress, but also that the right policies are put in place to encourage it.

⁴ IPCC Summary for Policymakers on Aviation and the Global Atmosphere, 1999, section 2
⁵ <http://money.guardian.co.uk/weekly/story/0,,2019827,00.html>, February 24, 2007
⁶ IPCC Emission scenarios – Importance for Assessing Aviation Contributions to Climate Change, Schlager, Sausen, Schumann, ICAO Colloquium on Aviation Emissions 14-16 May 2007
⁷ IATA http://www.iata.org/html_email/4365801-coo_brief/so_i_brochure.pdf

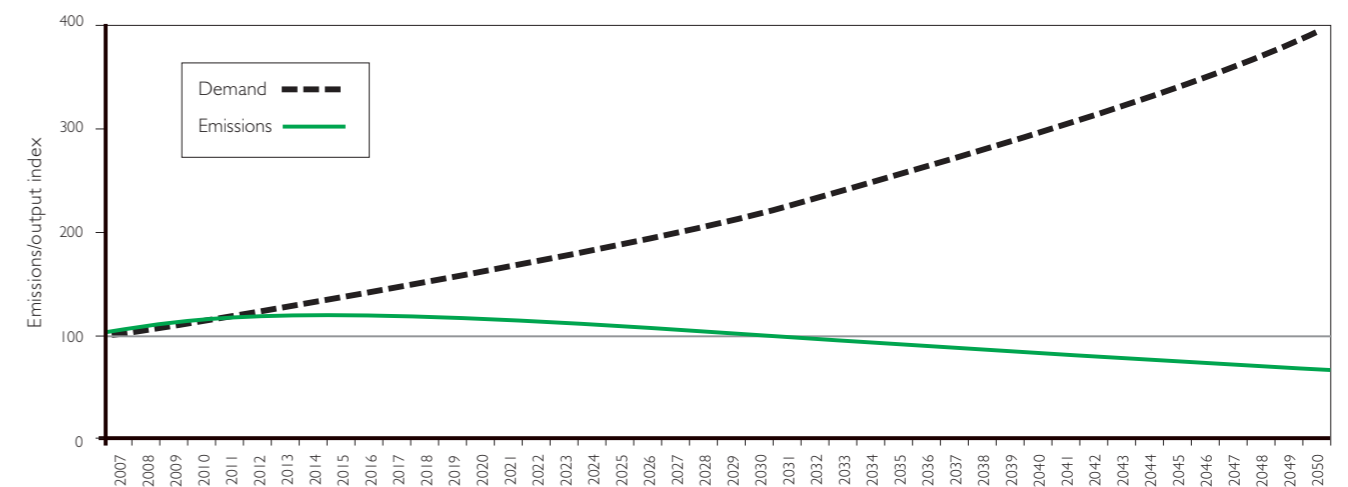
Such advancements will be made in many ways - including the use of advanced light-weight materials (such as the composite materials in the Boeing 787) and the use of innovative engine technology (such as open-rotors). We have come a long way from the propeller engines of the 1950s and 1960s.

The aviation industry is already committed to the targets established by the Advisory Council for Aeronautics Research in Europe (ACARE). The specific environmental targets are for an aircraft manufactured in 2020 to achieve 50% and 80% cuts in CO2 and NOx emissions per passenger km respectively, and a reduction of perceived external noise by 50%, all relative to a baseline of the best technology aircraft available in 2000.

Changes in airframe, air traffic control, fuel and propulsive technology in the next 40 years are expected to deliver another step change in efficiency that could make the aircraft flying 4-8 times cleaner than today’s cleanest models in 2050.⁸

Aviation is a maturing industry. With the exception of reports funded by environmental NGOs, most long-term passenger growth estimates are in the range of 2.5-3.5% per annum. At 3.5% p.a. growth the aviation industry would be 3.75 times larger in 2050. Yet **total** emissions are likely to fall by anywhere from 10% to 50% over the period as the substantial benefits from technological advances allow the decoupling of transport growth from emissions growth – or what the Stern Review called “green growth”. This is not an unfounded or unreasonable claim, the most recent work from the Tyndall Centre for Climate Change Research includes scenarios of aviation emissions being lower in 2030 than they are in 2007.

Global Aviation Emissions 2050



Assumptions: Annual demand in output assumed to grow by 5% to 2012 & by 3% thereafter Annual efficiency improvements assumed to be 1.2% to 2012, 4% to 2025, then 5%

50% CO2 reduction per passenger from 2015

easyJet recognises that 2050 is a long time away – particularly for politicians that are being asked to make decisions today. However, the next generation of aircraft technology is just around the corner, and we expect that it will reduce emissions per passenger km by 50% from 2015.

Engine manufacturers are currently researching open rotor jet engines; airframe manufacturers are working on lightweight aircraft and drag reduction technologies such as laminar flow wings; and Europe’s famously inefficient Air Traffic Control system is being slowly overhauled.

In mid-2007, **easyJet** unveiled its “ecojet” that could incorporate a number of these innovations and could be in Europe’s skies by 2015.

If demand for short-haul aviation in Europe continues to grow at 5% per annum, the UK aviation industry would be 1.48 times larger by 2015 than it is today, yet technological improvements would mean that short-haul flights could generate 2 times fewer emissions per journey. This is the very definition of “green growth” that the Stern Review foresaw and is being demanded of the aviation industry.

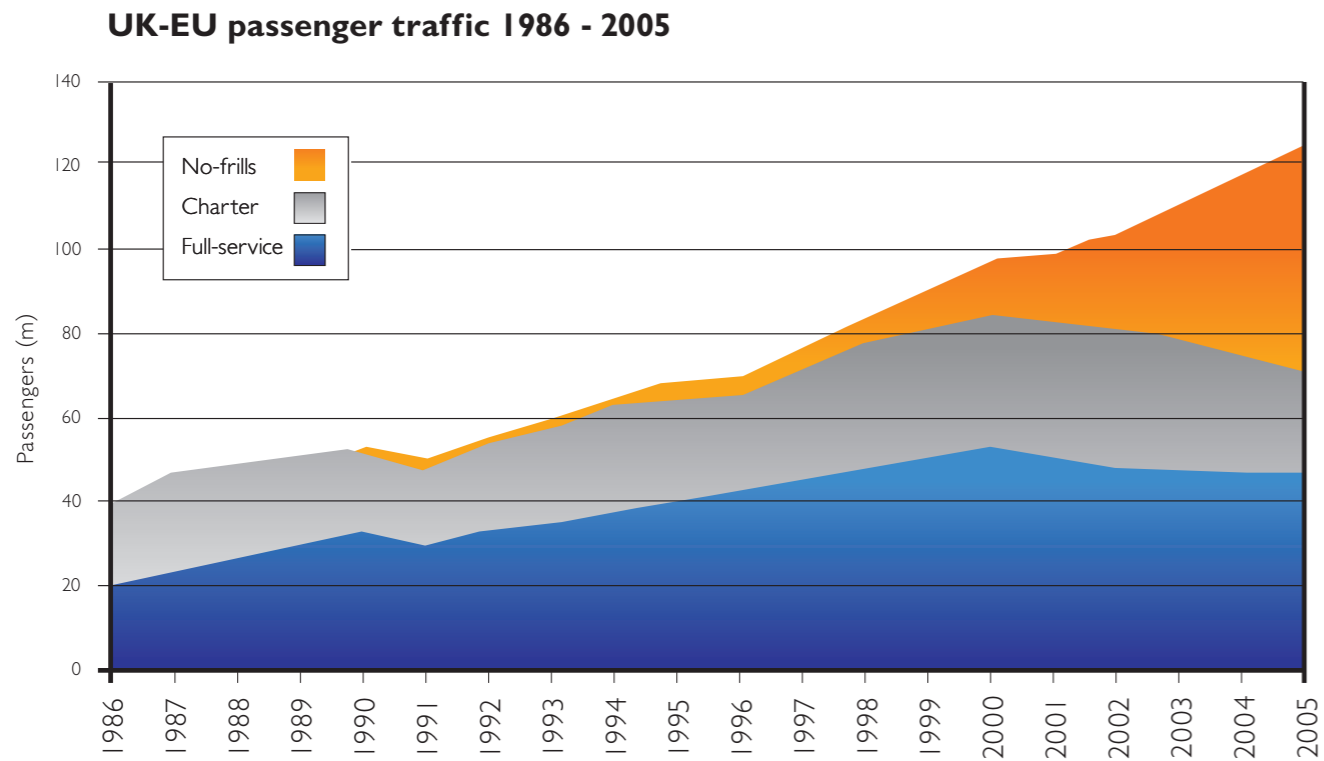
⁸ http://www.greenerbydesign.org.uk/_FILES/publications/GbD%20-%202006%20Annual%20Report.pdf

Efficient low-cost airlines are the solution, not the problem

The impact of emissions reductions outstripping passenger growth on the UK's aircraft emissions could be dramatic.

In recent years, UK – Europe passenger numbers have increased by 5.5% per annum, according to figures from the UK Civil Aviation Authority⁹. The chart below shows how the “full-service” and charter airlines have been displaced over the last 10 years by low-cost airlines.

This chart lays to rest the claims that there has been an “explosion” in the growth of flying in the last few years – rather, the annual rate of growth is substantially unchanged over the last 20 years.



Source: CAA Airport Statistics

easyJet has grown dramatically since its first flight in November 1995. However, it has done so in an efficient and relatively environmentally friendly manner, choosing to operate a fleet of environmentally-efficient aircraft that, at an average age of 2.3 years for its current 137 aircraft¹⁰, is among the youngest and most modern in the world for a major international airline. It operates with high seat densities and high passenger load factors. Even taking the additional fuel burn into account, **easyJet** estimates that it therefore emits 22% less CO₂ per passenger than the typical European airline operating an Airbus A319 on the same route.

Each of the additional passengers carried by **easyJet** over recent years has been emitting less CO₂ than if he or she had chosen to fly with a traditional airline. Other low-cost airlines operating fleets of substantially new aircraft could make similar claims.

Obtaining exact data relating to the CO₂ emissions per passenger of aircraft in 2000 is difficult, but it is mathematically likely that the growth of passengers each year has been more than offset by the 20%+ reductions in CO₂ per passenger carried by Europe's major low-cost airlines.

In the last five years traffic on the main domestic trunk routes to Belfast, Edinburgh and Glasgow has grown by 4%, during which low-cost airlines increased their market share by 6%. This, coupled with the underlying improvements in aircraft technology and airline operations, means that total emissions on these routes was less in 2006 than in 2001¹¹.

⁹ "No frills carriers: Revolution or Evolution", published November 2006

¹⁰ Figure correct at time of printing

¹¹ Source: CAA passenger data

Not all airlines are the same, least of all from an environmental impact perspective and governments and regulators should recognise this.

Taxes and laws should incentivise green behaviour

It is time for people to demand an intelligent approach to aviation from politicians and regulators. The focus should be on emissions not passengers and incentivising green consumer behaviour until the next generation of technology becomes available in 2015.

There are a lot of levers to pull. Taxation, airport charges, airport regulations, emissions trading, ownership restrictions on old aircraft, amongst others, can all be used to incentivise consumers to select airlines that choose to invest heavily in the most environmentally-efficient aircraft available.

Time to ban the 700 dirtiest European aircraft

The first step that the European Union should take is to ban the oldest 700 aircraft from the skies. The oldest aircraft are the least fuel-efficient and, therefore, the most environmentally damaging. According to figures from Airbus¹², a 1980s-vintage MD82 generates 21% more CO₂ per seat than the latest A319 in an equivalent seat layout. Boeing claimed¹³ that the 787-9 aircraft, due in service in 2008 will burn 27% less fuel per passenger than the older-generation A340-300 that it could replace in some fleets.

With the advent of new and environmentally-efficient aircraft, **easyJet** proposes that as of 1st January 2012 (i.e. the date all of aviation goes into the European Union's Emissions Trading Scheme) no transport aircraft built before 1st January 1990 should be allowed to remain registered in the EU and the requirement would then roll forward each year, so no aircraft operates in Europe older than 22 years of age. Importantly, this proposal also has the advantage of capturing freighter aircraft – often where older aircraft end up. The EU could mandate this by issuing an appropriate regulation.

According to data from Aircraft Analytical System, an aviation industry market information provider, of the 3,622 aircraft registered for operations within Europe, some 700 are more than 17 years old (i.e. built before February 1990). This represents 19% of the European fleet and, if they were all replaced now with the most modern technology, this could represent a saving of total emissions from European aviation of 4-5%.

UK air passengers heavily taxed but 40% of emissions untaxed

Given that not all airlines are the same, nor aircraft usage, it is appropriate to look at how the existing tax structures work for or against the environmental goal of incentivising ever-greener consumer behaviour.

Airlines carrying passengers departing from UK airports are subject to Air Passenger Duty (APD), which was introduced by the then Chancellor of the Exchequer Rt Hon Kenneth Clarke in 1994 and both its structure and its rate have been altered over the years by successive Chancellors. APD is estimated to net the Exchequer around £2.4 billion annually.

There are four bands of Air Passenger Duty depending on destination and class of travel. In the Pre-Budget Report in December 2006, the then Chancellor Gordon Brown doubled APD to the current rates:

Intra-EU Economy Class	£10
Intra-EU Business Class	£20
Beyond EU Economy Class	£40
Beyond EU Business Class	£80

But there are a number of serious structural problems with APD that make it a poor environmental tax:

- It does not reflect the climate change damage caused by a flight
- Approximately 40% of UK aviation activity does not pay APD as transfer passengers, air cargo, and private jets are all exempt¹⁴

¹² Airbus Global Market Forecast (GMF) 2006-2025

¹³ Boeing - http://www.boeing.com/news/releases/2007/q2/070424a_nr.html

¹⁴ Data sources: Transport Statistics Great Britain 2006 Edition, national Statistics; CAA CAP770 & CAP771

- APD is a flat-rate tax levied on airlines for each passenger they carry within two distance bands. A passenger travelling economy class from London to Marrakech would pay exactly the same amount (£40) as someone flying economy class to Melbourne; or a passenger travelling from Belfast to Liverpool pays exactly the same amount (£10) as someone flying from London to Athens
- The UK Government does not hypothecate the receipts of APD to environmental projects. Nor is it spent on any airport development costs (which are paid for by airlines and airports, in contrast to the rail network and train operators which received a subsidy of £6.3 billion from the Exchequer in 2006¹⁵)
- Individual air passengers receive no fiscal incentive to choose environmentally-efficient airlines (see example below). As a result, there is no fiscal incentive for airlines to choose to operate environmentally-efficient aircraft

The vast majority of **easyJet**'s UK departing passengers pay £10 in APD which represents a taxable rate of 22% of its average fare for its 2006 financial year of £45.17.

Government recognises APD is a poor environmental tax

It is not just **easyJet** that questions the environmental validity of APD. In February 2007, responding to questions relating to the doubling of APD from the House of Commons Environmental Audit Committee, John Healy, the financial secretary to the Treasury, admitted APD is a "very blunt instrument" and "not even the best tax instrument"¹⁷.

The Department for Transport's air transport White Paper stated in 2003¹⁸, "The Government recognises that because of its blunt nature, Air Passenger Duty is not the ideal measure for tackling the environmental impacts of aviation."

The Department for Transport, in its recently-published Emissions Cost Assessment consultation¹⁹ said "there are no clear external cost signals being given through taxation."

Air travel and taxation – already the most heavily taxed form of mass transport

It is a great misconception that aviation is lightly taxed or, as some claim, pays no tax at all. The £2.4 billion that the Government receives in APD each year outstrips the receipts from any other form of mass transport, except road transport.

Here is a comparison with other forms of cross-border transport.

- VAT is not added to any form of public transport in the UK
- No other form of international travel pays tax on its fuel (with the exception of international coach services, which tend to uplift fuel in the countries with the lowest fuel levies). The EU Fuels Directive prohibits the taxation of aviation fuel within the EU. Unless a tax on aviation fuel was consistently applied at a global level it would lead to more, not less, emissions from aviation as airlines would uplift more fuel in low-tax regions and fly it into high-tax regions (carbon leakage)
- No other form of transport – including trains, ships or coaches – is required to pay an equivalent of APD, which means that of all forms of mass transport, aviation is the most heavily taxed
- Aviation is unique in paying the full cost of its own infrastructure

¹⁵ <http://www.railway-technology.com/features/feature1159/>

¹⁶ **easyJet.com** & **Alitalia.com** – Alitalia CO2 per passenger estimation based on a standard 2-class A319 burns 27% more fuel than an **easyJet** A319 and that a standard 2-class configuration MD82 burns 21% more fuel than a standard 2-class A319

¹⁷ "Green tax is a blunt instrument, says Treasury Minister", Guardian Unlimited 7 February 2007

¹⁸ UK Department for Transport: The Future of Air Transport White Paper, December 2003

¹⁹ UK Department for Transport: Consultation on the Emissions Cost Assessment; August 2007

Emissions trading from 2011

In January 2005 the European Union Greenhouse Gas Emission Trading Scheme (EU ETS) commenced operation as the largest multi-country, multi-sector Greenhouse Gas emission trading scheme world-wide. The scheme is based on Directive 2003/87/EC, which entered into force on 25 October 2003.

Companies in the EU Emissions Trading Scheme must have permits for each tonne of CO2 that they emit in the course of their activity. Permits are initially allocated to companies by EU member states. Companies that do not have permits or have exceeded their permit allocation must acquire them from other companies included in the scheme (or via Clean Development Mechanisms or Joint Implementation Certified Emissions reductions).

On 20th December 2006, the European Commission proposed that aviation should be brought into the Emissions Trading Scheme for flights within the EU from 2011 (about 20% of Europe's aviation emissions) and all flights to and from Europe from 2012.

easyJet is a strong and active supporter of bringing aviation into the EU ETS as, unlike APD, it incentivises airlines to operate cleaner aircraft – the more environmentally-efficient the aircraft the fewer permits needed.

Emissions trading + APD + carbon offsetting: fly once pay three times?

However, at present the UK Government has no plans to adjust APD to compensate for the additional cost burden to airlines of operating within the ETS.

Meanwhile, the UK Department for the Environment, Food and Rural Affairs is encouraging companies to offer carbon offsetting products, yet the Department for Transport says²⁰ "We do not propose to take individuals' offsetting decisions into account in the emissions cost assessment, as this is an additional payment made by the air traveller rather than the industry which is not possible to monitor."

This means that an individual passenger could pay APD (which the government considers an environmental tax), plus higher fares to accommodate EU ETS, plus as an individual offset the carbon from their flight; in effect, such a passenger would fly once and pay the environmental cost of their journey through three different mechanisms.

Towards a more equitable way of taxing aviation

The environmental contradictions that are inherent within the current structure of APD and the uncertainty of what will happen to the tax once aviation is included in the ETS has led **easyJet** to publish its own tax proposal that would be fiscally neutral for the Treasury.

easyJet proposes a simple flight based tax based on a combination of the aircraft type and the distance flown. This would ensure that the tax much better reflects actual emissions, and therefore climate change costs. It would also incentivise airlines and passengers to fly as environmentally efficiently as possible, by, for example, flying fuller and cleaner planes.

This tax would be based on estimated emissions from a flight, and could use work carried out by Eurocontrol on the relationship between the emissions from flights and aircraft types and distances. The tax bill for each flight would be simple to calculate, could be determined on a single spreadsheet, and would be simple to monitor. We have considered the complex law surrounding aviation taxation and believe that such a tax would be legal. That's why **easyJet** strongly supports the decision announced in the Pre-Budget Report of 9 October 2007 to reform the structure of Air Passenger Duty to tax aircraft not passengers from 2009. This is the right decision and **easyJet** looks forward to working with the government on a new structure that properly reflects the pollution levels of different aircraft types and the distance flown by those aircraft. While aviation can be taxed more intelligently, **easyJet** cautions that this must not be used to increase the overall levels of tax from airline passengers.

²⁰ UK Department for Transport: Consultation on the Emissions Cost Assessment; August 2007

Not all airlines are the same: Don't treat them as such

Penalise aviation's gas-guzzlers

It is widely understood that different cars pollute at different levels. Yet there is no such understanding for aircraft. For example, David Cameron speaking on BBC Radio 4's Today Programme on Monday 20th August 2007 said:

"There are two very important tax approaches that we will take. The first is we think we should rebalance the tax system, putting up taxes on pollution – on air travel and gas-guzzling cars – so that we can cut taxes on Britain's families. That will be fiscally neutral....."

The relative levels of pollution of road vehicles is recognised by all political parties and most talk about the need to increase the tax burden on "gas-guzzlers". Air travel, however, is treated in a one-dimensional manner with no declared distinction between the cleanest and the dirtiest aircraft.

Traditional airlines emit 27% more CO2 per passenger than easyJet

The discussion about taxation is crucially important because it fails to distinguish between the emissions of different aircraft and the aggregate emissions of different airlines. Other environmentally efficient airlines will no doubt be able to make their own comparisons. However, given we have detailed facts available about **easyJet** we have used the airline by way of example, using **easyJet**'s standard aircraft the Airbus A319.

- The typical seating configuration of an Airbus A319 is 124 seats²¹. **easyJet** Airbus A319s fly with 156 seats – which is 26% more seats than the norm
- **easyJet**'s average load factor (percentage of seats sold) in 2006 was 84.8%; the average load factor for European airlines in 2005 was 68.3%²²
- **easyJet** sells on average 132 seats per flight; a typical European airline would sell 84 seats per flight
- Each of **easyJet** Airbus A319s potentially carries 57% more passengers per flight than the European norm.
- Even taking the additional fuel burn into account for more passengers, **easyJet** estimates that the typical European airline operating an Airbus A319 would burn 27% more fuel per passenger, compared to **easyJet**

Ensuring the sustainable growth of aviation

Calculating the "full environmental costs of aviation"

The Stern Review recommended that the best way to tackle carbon emissions is to ensure that each activity which consumes carbon is priced in a way that reflects its true cost to society, and to the environment. The Review thus supported the policy set out in the 2003 The Future of Air Transport White Paper which stated that the price of air travel should, over time, reflect its environmental and social impacts.

easyJet supports this recommendation with provisos:

- It must take into account the social and economic benefits of aviation, rather than a one-dimensional analysis of its costs
- It should be true of all parts of the aviation industry (including transfer passengers, freight and private jets)
- It should be applied to all other modes of transport; for example, despite its emissions there is no taxation on international shipping;
- It should be applied to all other energy-emitting industries

Carbon is a commodity tradable on the world markets. The current price of carbon is around €17 per tonne. However, what some call the "full environmental cost of aviation" or the Stern Review called the "marginal social cost of carbon" is a measure of the economic cost of CO2.

²¹ Source – Airbus

²² Association of European Airlines Annual Results 2006

Like many other issues in this fledgling area, it is complex and divisive. There is not universal agreement on the principles of how it should be calculated (**easyJet** argues that it looks too narrowly at the "costs" of aviation, without taking into account its "benefits").

easyJet already covers its full carbon costs

Using the Government's official estimates²³ of the cost of carbon (£26 per tonne of CO2 and £95 per tonne of carbon in 2007), easyJet covers its carbon emissions cost by four times.

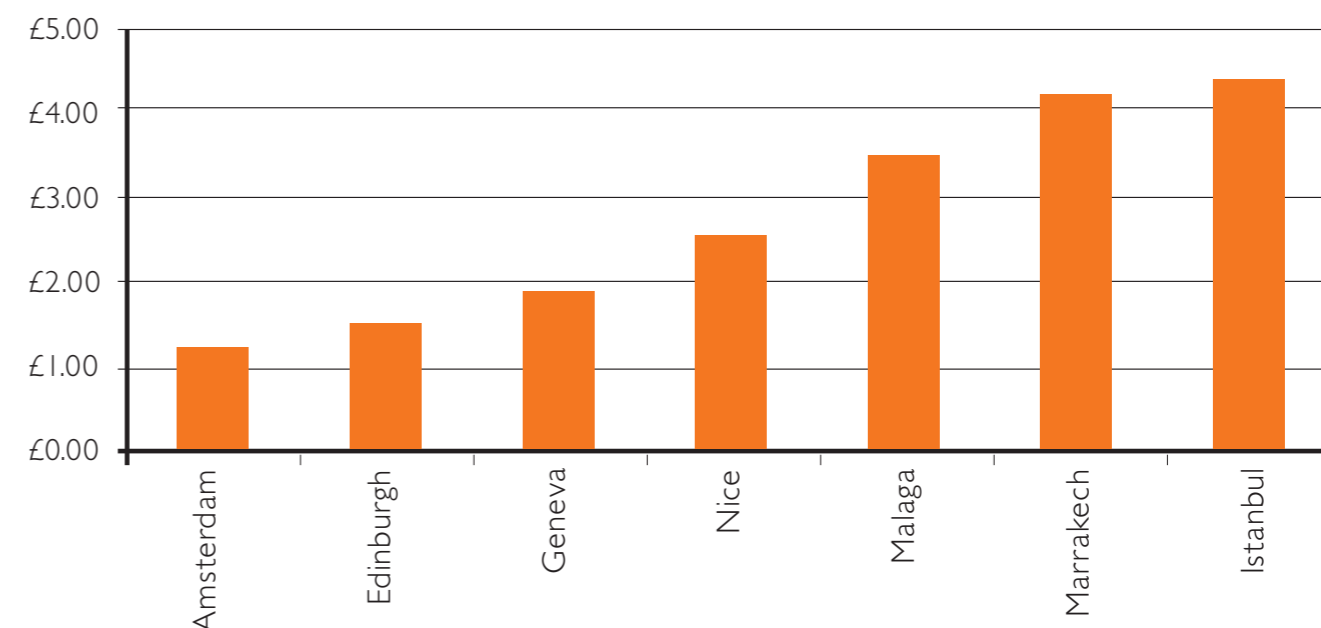
During **easyJet**'s financial year to 30 September 2008, the airline expects to emit about 1.5 million tonnes of CO2 (or 0.4 million tonnes of carbon) related to departures from UK airports – how APD is currently calculated. Taking the Government's official estimate of the cost of Carbon of £26 per tonne of CO2 **easyJet**'s carbon emissions have externality costs of £41.4 million, against its estimated APD bill for the year of around £165 million.

Taking these figures:

- **easyJet** at an aggregate level covers its full carbon emissions costs four times over
- Even using the scientifically-unsound multiplier of 1.9, **easyJet** still covers its full carbon costs by more than two times over

The difference between the tax paid and the full carbon costs is most marked on short-routes, where **easyJet** covers its full carbon costs up to 10 times yet even on **easyJet**'s longest routes to Marrakech, Istanbul and Athens the airline is still covering its full carbon costs (as the chart shows).

Social cost of CO2 for selected **easyJet** routes from London

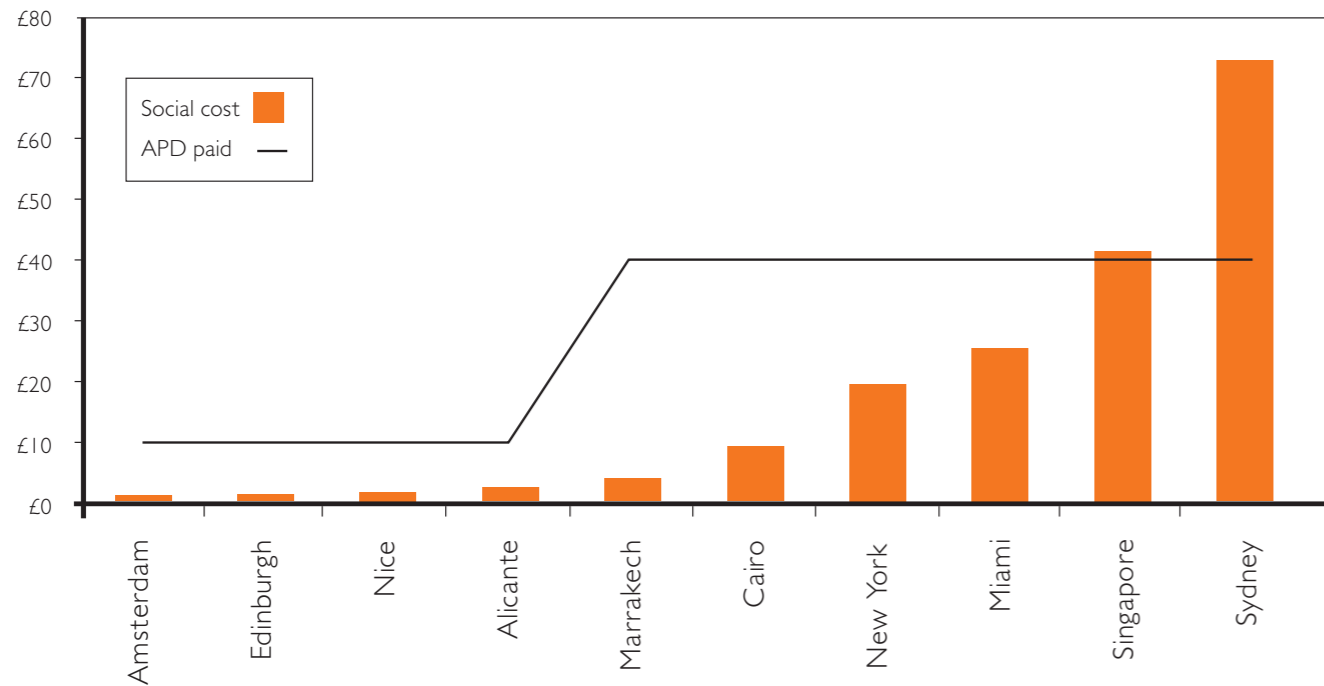


Source: **easyJet** data. Social cost of CO2 used £26 / tonne as per DEFRA guidance of 13/08/07

Other UK airlines are also likely to be already covering their full carbon costs. These are most likely to be short-haul airlines operating the most environmentally-efficient aircraft technology with high load factors yet which are penalised by the flat-rate discriminatory nature of APD. Interestingly at a route level, it is only the very longest routes that do not cover their full environmental costs.

²³ DEFRA guidance issued 13 August 2007

Flights departing from London: social cost of carbon compared to APD paid



Source: easyJet data for routes up to Marrakech, climatecare.org for long-haul routes. Social cost of CO2 used £26 / tonne as per DEFRA guidance of 13/08/07

The importance of aviation

Aviation is a creator of jobs and a driver of economies

Aviation is one of the world's most important industries. It provides the only worldwide transportation network, which makes it essential for global business and tourism. And it plays a vital role in facilitating economic growth, particularly in developing countries.

At a global level the air transport industry generates a total of 29 million jobs globally through direct and indirect employment:

- 5.0 million direct jobs in airlines, airports and civil aerospace manufacturing
- 5.8 million indirect jobs through purchases of goods and services from companies in its supply chain
- 2.7 million induced jobs through spending by industry employees
- 15.5 million direct and indirect jobs through air transport's impact on tourism

The air transport industry contributes around US\$ 880 billion a year to world GDP, taking into account direct, indirect and induced impacts – equivalent to 2.4% of global GDP. Its direct impact on GDP is US\$ 330 billion²⁴.

Families and communities across the world rely on aviation

Globally, millions of people depend on the access to markets that air travel brings for their products and particularly for perishable goods which need to reach their destination quickly. As a society, we have become reliant on consuming fruit and vegetables at times of year when they are not naturally grown in our climate.

In Kenya, exports by air of agricultural products (e.g. fresh vegetables and cut flowers), largely to Europe, already constitute one of the country's largest industries and the second biggest earner of foreign exchange.

²⁴ source - <http://www.atag.org/files/Soceconomic-121116A.pdf>

The Kenya Organic Agriculture Network recently pointed out that there are 150,000 people dependent on organic farming in Kenya for their livelihoods and fear that a partial or total ban on air-freighted organic exports, would lead to the likely collapse of their industry.

They also point to a recent study which revealed that less carbon was emitted growing flowers in Kenya and air-freighting them to Europe than producing the flowers in the Netherlands where more energy is required to heat greenhouses²⁵.

Our island trading nation

The United Kingdom is an island economy in a global society. For centuries its people have relied upon travel to retain family, cultural or trade links. And that reliance is even greater today given the international nature of our society.

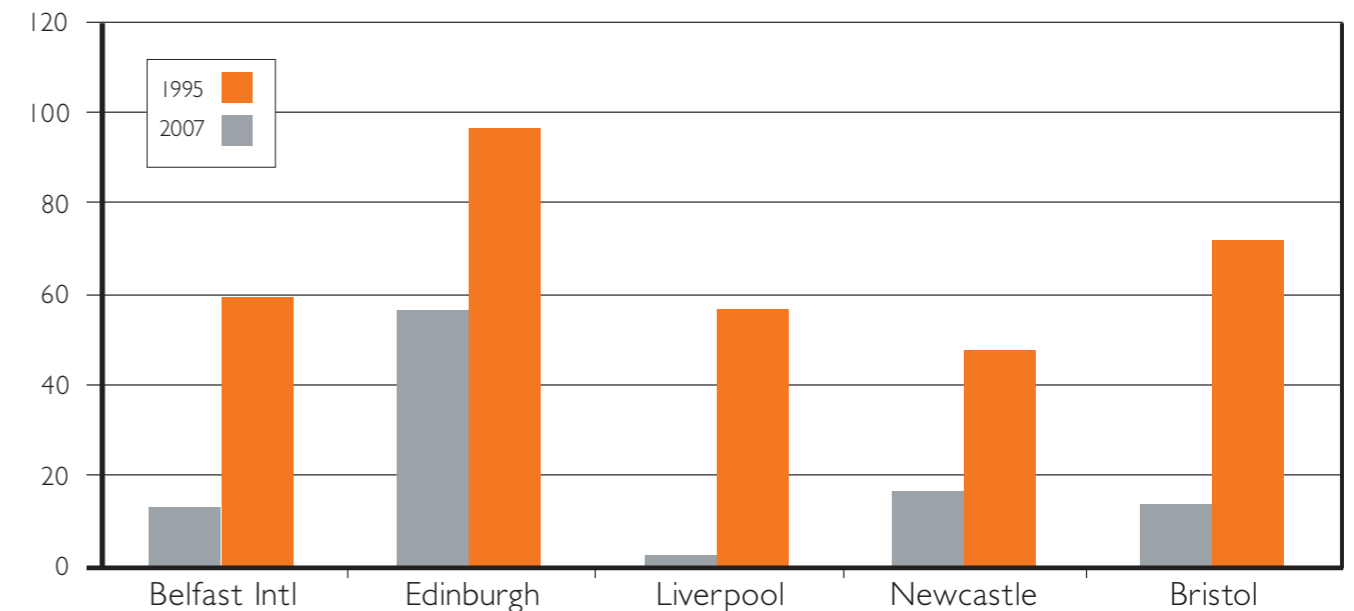
According to the UK Government²⁶, the aviation industry provides around 200,000 jobs directly and many more indirectly and contributes around £11 billion directly to the economy. Many billions more are contributed to the economy from the trade that aviation enables.

The UK Department for Transport in its 2003 Air Transport White Paper²⁷, pointed out that:

- Today, UK residents make around 60 million visits overseas each year, compared to just thirteen million in 1978. Around 80 per cent of these are by air.
- Inbound tourism to the UK economy accounts for an estimated 4.4 per cent of GDP in 2002, and more than two million direct jobs.

Much has been written of the importance of air travel to the success and future of London as a global financial centre, but in recent years the growth of low-cost airlines flying point-to-point services has significantly increased the accessibility of the UK regions for business and tourism. The charts show the increase in the absolute number of routes from a selection of UK regional airports and how passengers have shifted from traditional airlines to low-cost airlines over the last decade.

Route evolution at selected UK regional airports



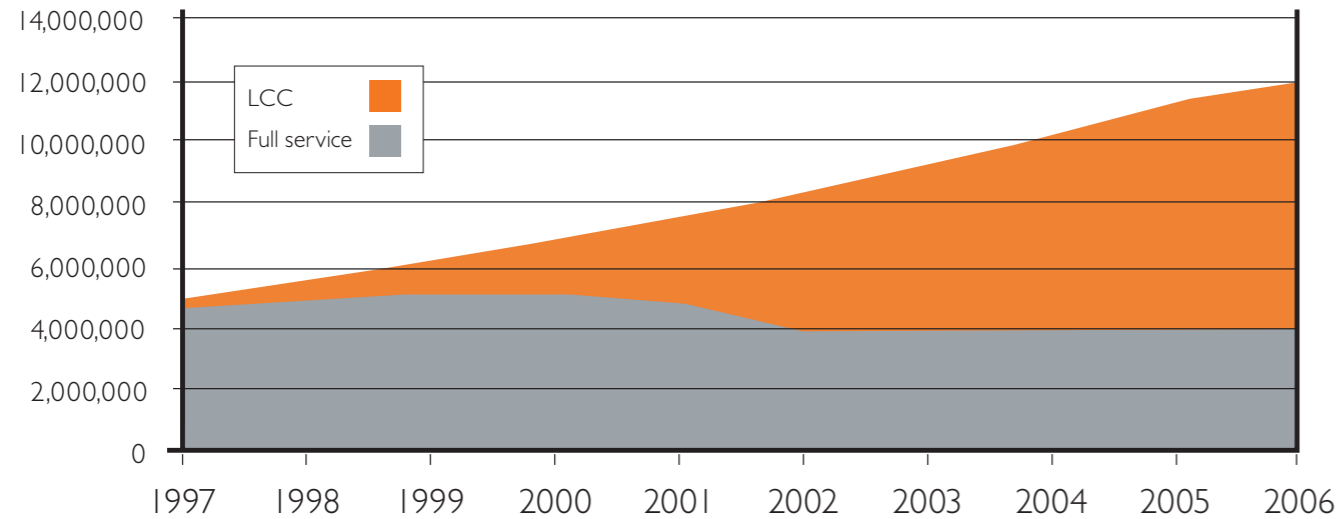
Source: Airport data

²⁵ http://www.timesonline.co.uk/to/life_and_style/food_and_drink/real_food/article2182994.ece

²⁶ UK Department of Transport: The Future of Air Transport Progress Report, December 2006

²⁷ UK Department for Transport: The Future of Air Transport White Paper, December 2003

Departing passenger evolution at Belfast, Edinburgh, Liverpool & Newcastle



Source: CAA passenger data

easyJet – cleaner than the average car

In February 2007 the European Commission proposed that mandatory standards should be imposed on car manufacturers to reduce the CO2 emissions of the average new car sold in Europe to 130g/per km driven.

Currently, however, the average European car emits roughly 164g of CO2 for every kilometre travelled. Research shows that the average car journey has 1.6 occupants, which implies that European family cars emit roughly 100g of CO2 for every passenger kilometre²⁹.

As previously mentioned, easyJet emits 95.7g of CO2 per passenger kilometre – less than the average European car and less even than the 104g of CO2 per kilometre emitted by the Toyota Prius with single occupancy.

Towards greener skies

easyJet recognises that flying aircraft emits greenhouse gases which contribute to climate change and believes that this generation of consumers, regulators and politicians has an obligation to do something about it.

Aviation is substantially cleaner today than it was 40 years ago and similar steps forward in technology will make it substantially cleaner in another 40 years. But our elected officials and civil servants must incentivise consumers today to take the greener option when it is available – this means banning the dirty, old aircraft from our skies; getting the right tax regime in place to reward cleaner behaviour; being realistic about the value of aviation and the lack of genuine alternatives; and recognising that sometimes the received wisdom isn't always wise – as any of the surprising truths in this document will have shown.

The lack of real alternatives to air travel

Rail – an inconvenient, dirtier option for many

To argue that routes to continental Europe from Belfast or Liverpool or Newcastle are substitutable by rail is to assume that time is not an important commodity for UK citizens living in those regions. It is peculiarly London-centric to argue that "short-haul journeys should be made by rail" as many have done. For most living in the UK regions, air travel is the only realistic means they have of reaching Continental Europe.

easyJet only has two routes (London Stansted – Newcastle and London Luton – Paris) where the city-centre to city-centre rail journey is less than four hours. These routes represent less than 2% of passengers carried by easyJet in 2006. In both cases, easyJet caters for demand which is not necessarily travelling city-centre to city-centre.

Travelling to even the most accessible cities of Paris, Brussels and Amsterdam from any UK point apart from London is exceptionally time consuming, so rail travel does not represent a realistic alternative for the vast majority of UK citizens – particularly those in living in Belfast where there is a second sea barrier to cross.

easyJet – cleaner than Virgin Voyager trains

Even so, a recent report breaks the myth that rail travel is necessarily more environmentally-efficient than travelling by aircraft.

The study, commissioned by the Rail Safety and Standards Board²⁸, concludes that Virgin Voyager trains, the most advanced diesel train on the network, emit 112g of CO2 per passenger km.

In its financial year to 30th September 2006, easyJet flights produced an average CO2 emission of 95.7g per passenger kilometre. **This means that on certain routes it will be better for the environment to fly by easyJet, rather than taking the train.**

The numbers are based on the existing average passenger loads, rather than the total number of seats available (the measure that the rail industry prefers) - across the whole day, a third of train seats are occupied.

²⁸ Quoted in The Times "Rail industry admits that it's often greener for families to travel by car", 13 July 2007

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²⁹ Transport and environment: facing a dilemma - TERM 2005, EEA Report No 3/2006, 28 March 2006 http://reports.eea.europa.eu/eea_report_2006_3/en/term_2005.pdf

Demand a more intelligent approach to aviation

The big questions

Should we ban aircraft?

easyJet's view

Yes Ban 700 of the oldest and dirtiest aircraft in Europe

Is there a better way to tax flying?

Yes Reform Air Passenger Duty to tax aircraft not passengers. Focus on polluters, not families

Should air travel be cleaner?

Yes Push airlines to buy the next generation of aircraft. Flying could be 50% cleaner within 10 years

Can individuals help?

Yes Choose airlines with new aircraft, higher passenger loads, fewer emissions. easyJet emits 22% less CO2*

Tell the politicians you demand an intelligent approach to aviation. Visit our website to find out how

*Claim based on a comparison between an **easyJet** aircraft and a traditional airline flying the same aircraft type on the same route

easyJet.com