

# Aviation and Global Climate Change

People living near airports have long suffered from aircraft noise, traffic congestion and air pollution. Indeed communities around airports have been concerned about these issues for years. However new evidence shows that air travel is contributing towards a far greater threat - **CLIMATE CHANGE**.



## Air travel growth + CO<sub>2</sub> emissions

Air travel is the world's fastest growing source of greenhouse gases like carbon dioxide, which cause climate change. Globally the world's 16,000 commercial jet aircraft generate more than 600 million tonnes of carbon dioxide (CO<sub>2</sub>), the world's major greenhouse gas, per year. Indeed aviation generates nearly as much CO<sub>2</sub> annually as that from all human activities in Africa.

The huge increase in aircraft pollution is largely due to the rapid growth in air traffic which has been expanding at nearly two and half times average economic growth rates since 1960. It is expected the number of people flying will virtually double over the next 15 years. This means increasing airport capacity, more flights, more pollution and increasingly crowded airspace.

## CLIMATE CHANGE

Some of the gases in our atmosphere, such as carbon dioxide, trap heat from the sun reflecting off the earth's surface, keeping the earth warm. This is the natural greenhouse effect. However human activities such as the burning of fossil fuels are increasing the concentrations of these gases in the atmosphere. These additional gases are enhancing the greenhouse effect which is known as global warming. The effect of global warming is to increase global surface temperatures and ultimately cause climate change.

The major greenhouse gases include carbon dioxide, methane, nitrogen oxides and water vapour.

## Impacts of climate change

Scientists predict surface air temperatures are likely to rise between 1° to 3.5°C over the next century. This rate of warming is likely to be greater than at any time in the last 10,000 years. Although the effects will vary from place to place there is expected to be an increase in the number of very hot days and a decrease in the number of very cold days.

**More extreme weather events** - Global warming is likely to lead to more natural disasters such as hurricanes, droughts and floods. The number of major natural disasters has increased threefold since the sixties.

**Spread of infectious diseases** - The likely increase in warmer and wetter weather could enable infectious diseases such as malaria and yellow fever to spread to new areas. Malaria has already resurfaced in Spain and doctors in the south of England have been warned by the Department of Health to look out for malaria cases from local mosquitoes. Malaria is now the biggest killer of humans on the planet.

**Disappearing countries** - Global warming is expected to lead to a rise in sea levels of between 15 and 95cm over the next century. Many islands and low lying coastal areas will be affected by rising sea levels and some island nations could disappear altogether.

**Environmental refugees** - Global warming could lead to the displacement of millions of people. Rising sea levels, floods and drought could make former land uninhabitable. Changing weather patterns could affect food crops and accelerate water shortages. According to a Red Cross report, in 1999 for the first time ever environmental refugees outnumbered those displaced by war.

**Effect on tourism** - Ironically one of the industries most at risk from climate change is tourism. Many tourist destinations depend on the natural environment for their appeal to tourists. A recent study commissioned by the World Wide Fund for Nature (WWF) (see website: <http://www.wwf-uk.org/campaigns/camp-climateF.htm>) found many

popular British tourist destinations would be threatened as a result of global warming. Low lying island nations like the Maldives could be submerged by rising sea levels. Popular tourist destinations such as Greece and Turkey could become unbearable as average summer temperatures rise. Popular skiing destinations like Austria and Scotland could suffer from a shortage of snow.

## Local impact of aircraft emissions

Aircraft emissions can also have a significant effect at ground level. Air and ground traffic at major airports can lead to pollution levels as high as those in city centres. A recent study of Gatwick airport predicted that NOx emissions from cars could decrease by 75% by 2000 due largely to cleaner vehicles, but aircraft emissions of NOx are expected to double by 2008. As a result the National Air Quality Standard for nitrogen dioxide (NO<sub>2</sub>) may be exceeded in nearby towns. It is important that adequate air quality monitoring is carried out at major airports to ensure National Air Quality Standards are achieved. A report undertaken for the Health Council of the Netherlands reveals airports have a negative impact on public health. The Health Council has called for public health impact assessments of airports that would assess the cumulative way people are exposed to hazards including air pollution, noise and safety from airports operations.

## Need for an environmentally sustainable airports policy

"...an unquestioning attitude toward **future** growth in **air travel**, and an acceptance that the projected demand for additional **facilities** and service must be met, are incompatible with the aims of **sustainable** development.."

Royal Commission on Environmental Pollution 18th Report, 'Transport and the Environment', October 1994.

## IMPACTS OF AIR TRAVEL ON THE ATMOSPHERE

In 1999 the world's top climate scientists, the Intergovernmental Panel on Climate Change (IPCC), published a detailed study of the impact of aircraft pollution on our atmosphere - Aviation and the Global Atmosphere (see website <http://www.ipcc.ch/index.htm>).

The report's findings support the following:

- Aircraft release more than 600 million tonnes of the world's major greenhouse gas CO<sub>2</sub> into the atmosphere each year.
- Aircraft cause about 3.5% of global warming from all human activities.
- Aircraft greenhouse emissions will continue to rise and could contribute up to 15% of global warming from all human activities within 50 years.
- Nitrogen oxides (NOx) and water vapour have a more significant effect on the climate when emitted at altitude than at ground level. Hence any strategy to reduce aircraft emissions will need to consider other gases and not just CO<sub>2</sub>.

- An increase in supersonic aircraft flying could further damage the ozone layer as aircraft emissions of NOx deplete ozone concentrations at high altitudes, where these aircraft would typically fly.
- Aircraft vapour trails or contrails, often visible from the ground, can lead to the formation of cirrus clouds. Both contrails and cirrus clouds warm the Earth's surface magnifying the global warming effect of aviation.
- The impacts on the global atmosphere from air travel will be concentrated over Europe and the USA where 70-80% of all flights occur. Hence the regional climatic impacts of aircraft emissions over these areas are likely to be greater than predicted by the IPCC report (which used global averages).

**Most significantly, the climate scientists concluded that improvements in aircraft and engine technology and in air traffic management will not offset the projected growth in aircraft emissions. That is, we need to slow the growth in air travel if we want to reduce the growth in aircraft greenhouse gas emissions.**

The last UK airports policy, which was published over 15 years ago, focussed largely on airport capacity while virtually ignoring the impacts of air travel. In 1998 the Government promised to publish a new airports policy, looking 30 years ahead, that would consider the environmental and social impacts of flying. However a new airports policy is unlikely to be published until after the next General Election. Meanwhile the Government is allowing a massive expansion of UK airports (see Plane Crazy leaflet. Published by FoE and AEF, May 1999) which is undermining the development of an environmentally sustainable aviation industry. It is vital that the new airports policy specifically addresses how harmful greenhouse gases from aircraft will be reduced and that adequate resources are put into encouraging alternatives to flying such as high speed rail.

## THE HIDDEN SUBSIDIES OF FLYING

"...the **demand** for air transport might not be **growing** at the present rate if airlines and their **customers** had to face the costs of the **damage** they are causing to the **environment**."

Royal Commission on Environmental Pollution 18th Report, 'Transport and the Environment', October 1994.

Research undertaken for the 'Right Price for Air Travel' campaign reveals that the European aviation sector receives about £30 billion of subsidies annually both directly through payments for expansions and surface access and indirectly through exemptions on aviation fuel tax and VAT.

Currently airlines pay no duty or VAT on aviation fuel, no VAT on airline tickets and no VAT on new aircraft. Duty free sales, a tax payer subsidy, also provided up to 50% of airport revenue although all EU flights are now exempt from duty free sales.

In the UK airlines would have to pay at least £5 billion a year if they were taxed at the same rate as motorists. This amounts to more than £200 per household in the UK. Effectively we all subsidise the aviation industry to pollute regardless of whether we fly or not.

Airports can also benefit from direct subsidies for airport expansions or investment in airport related infrastructure such as the expansion or construction of surface access roads. For example in 1998 the Government announced it would be investing nearly £100 million to widen the M25 London ring road. Heathrow airport will be one of the major beneficiaries of this.

**Partly as a result of these hidden subsidies air tickets are 41% cheaper than they were ten years ago**

## The polluter must pay - case for taxes and charges

'My **conclusion** is that there is a role for a tax if businesses of all sizes and from all **sectors** are to contribute to **improved** energy efficiency and **help** meet the UK's **emissions** targets'

Lord Marshall (Chairman of British Airways) commenting as chair of a UK Treasury task force investigating the use of new economic instruments to reduce the emissions of greenhouse gasses.

Air travel has an unfair advantage over other transport modes such as the car; bus and train because airlines don't pay tax on aviation fuel. The absence of a fuel tax or an emissions based levy allows airlines to charge artificially low ticket prices as the cost of pollution is passed on to society and not the passenger.

**Fuel taxes** - An aviation fuel tax would encourage more efficient aircraft by taxing fuel consumption. According to the International Air Transport Association, fuel makes up less than 15% of the cost of flying so there is little incentive for airlines to invest in more efficient aircraft. Unlike an emissions trading scheme, which will take years to develop, an aviation fuel tax could be implemented relatively quickly by removing the fuel tax exemption from existing bilateral air service agreements. Ideally this should happen at a global level but it could begin at an EU wide level if a global agreement couldn't be reached quickly enough.

**Emissions levy** - an alternative way to make airlines pay for their pollution is through a charge or tax on aircraft emissions. The European Union has suggested an environmental charge (levy) on aircraft emissions could be implemented on a European wide basis if no action is taken internationally to reduce aircraft emissions (EU Communication on Air Transport and the Environment IP/99/925). The emissions levy has advantages over a fuel tax in that it would directly tax emissions and not just fuel consumption. It would also be easier to introduce a levy as bilateral air service agreements don't prevent levies on emissions unlike fuel taxes.

An aviation tax or emissions levy is necessary because:

- airlines should pay for the pollution they cause just like other transport operators
- it would encourage the development of more efficient and less polluting aircraft
- it would help reduce demand for air travel
- it would be consistent with the UK obligations to reduce greenhouse gas emissions
- it would be much easier to implement than emissions trading permits (see below)

## Emissions trading - profiting from pollution

Some airline operators are arguing for an emissions trading system to reduce greenhouse gas emissions from aircraft. Emissions trading would enable airlines to buy and sell greenhouse gas permits. Each permit would allow an agreed level of a greenhouse gas such as CO<sub>2</sub> to be emitted. The attraction for airlines is that those who have chosen to invest in more efficient aircraft will be rewarded under such a scheme, not least because they will be able to profit from selling their excess CO<sub>2</sub> allowance. The other major attraction is that there will be no real constraint on air travel expansion if airlines are able to buy emissions permits from other industry sectors.

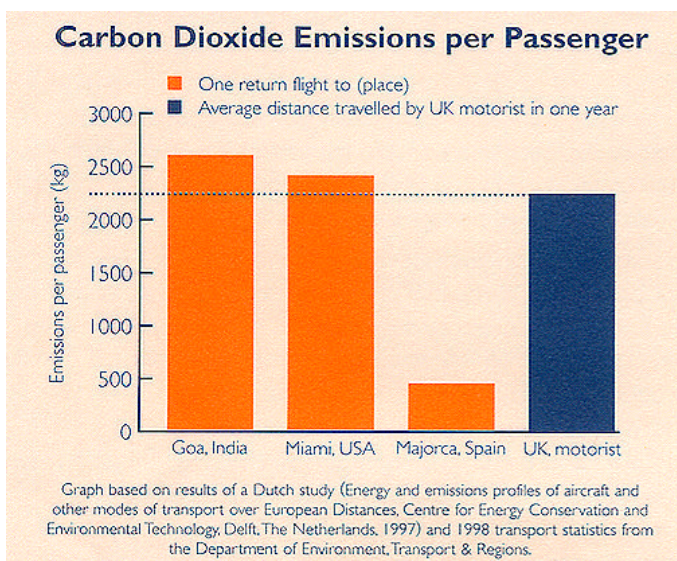
The Association of European Airlines have proposed a voluntary system of emissions trading. However as this scheme cannot be enforced it is no substitute for an aviation fuel tax or emissions levy.

Emissions trading is not an effective way to reduce greenhouse emissions because:

- the trading system will not be agreed for years
- no body exists to enforce the system
- aircraft emissions could continue to grow if airlines are allowed to trade with other industry sectors
- the aviation industry is unlikely to agree to a reduction in emissions permits overtime

## Alternatives to flying

Even if you only fly once a year you can generate a significant amount of greenhouse pollution. For example a passenger taking a long haul flight from the UK to the USA can produce as much carbon dioxide as a motorist driving in the UK for a whole year.



For a typical Journey under 500km, say London to Amsterdam, the amount of CO<sub>2</sub> produced per passenger is 0.17 kg/km for air travel, 0.14 kg/km for travel by car; 0.052 kg/km for rail and 0.047 kg/km by boat (ie. ferry).

### High speed rail

There have been a number of studies showing how air travel produces far more CO<sub>2</sub> emissions per passenger than rail. A Dutch study published in 1997 (Energy and emissions profiles of aircraft and other modes of transport over European Distances, Centre for Energy Conservation and Environment Technology, Delft, The Netherlands, 1997) compared the greenhouse emissions from air transport vs. a number of other transport users.

As can be seen in terms of CO<sub>2</sub> emissions, air travel is clearly more polluting than rail. Over short distances (ie. <500km) air travel produces around three times more carbon dioxide per passenger than rail. Yet nearly 70% of all flights within European airspace are less than 1000km long. With over 7½ million flights within European airspace in 1998, there is a lot of scope to move short haul flights to rail.

The European Union is already spending £3 billion from 2000 to 2006 on the Trans European Network program, which encourages transport links between member states. The majority of this funding will be for investment in rail. Meanwhile Spain are to invest 1 billion on a fast rail link between Barcelona and Madrid which will cut 4 hours off a 6½ hour journey and Germany is launching a 330 km train to travel between Hanover and Amsterdam in 2000.

As well as less pollution, rail companies can boast faster check in times, city centre to city centre travel and less frequent delays than most airlines.

### Teleconferencing

Advances in telecommunications can reduce the need to travel. Tele- and video-conferencing are a viable alternative to flying for many business travellers. They can also reduce travelling time, traffic congestion and aircraft pollution.

### Lobby the Government

Write to the : Rt Hon John Prescott,  
Deputy Prime Minister  
Eland House  
Bressenden Place  
London SW1E 5DU

Ask the Government to:

- ensure the new airports policy has a clear strategy to reduce aircraft greenhouse gases.
- support the EU position for an emissions charge on aircraft emissions
- suspend decisions on any further major airport developments until it's airports policy is published.

### What can you do

- Choose to fly less frequently whether for business or pleasure
- Consider taking a train as an alternative to domestic or short haul flights
- Investigate teleconferencing as an alternative to business flights
- Support the domestic tourist industry and plan more holidays in the UK

### For further information

#### Aviation Environment Federation

Sir John Lyon House, 5 High Timber Street,  
London EC4V 3NS  
(Plane Crazy leaflet available from AEF)  
Tel: 020 7329 8159 Fax: 02073298160  
web: www.aef.org.uk e-mail: info@aef.org.uk

#### Friends of the Earth

26-28 Underwood Street, London N1 7JQ  
Tel: 020 7490 1555 Fax: 020 7490 0881  
web: www.foe.co.uk

#### National Society for Clean Air and Environment Protection (NSCA)

136 North Street, Brighton BN1 1RG  
Tel: 01273 326 3133 Fax: 01273 753 802  
web: www.greenchannel.com/nsca  
e-mail: info@nsca.org.uk

#### The Right Price for Air Travel Campaign

www.milieudefensie.nl/airtravel

