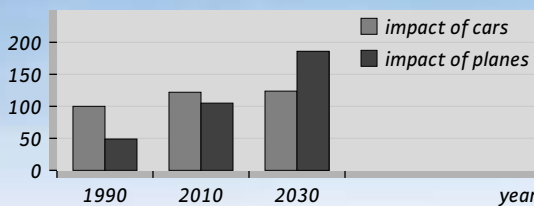




Climate Change

Aviation Emissions, an ignored but fast growing problem

Air travel is the world's fastest growing source of greenhouse gases like carbon dioxide, which cause climate change. Globally the world's commercial jet aircraft fleet generates more than 700 million tons of carbon dioxide (CO₂), the world's major greenhouse gas, per year. One person flying a return trip between Europe and New York generates between 1.5 and 2 tons of CO₂. This is approximately the amount a European generates at home for heating and electricity in one year.



Worldwide comparison cars and planes, impacts on climate change. Scale: cars in 1990 = 100. Source: OECD 2000

The huge increase in greenhouse gas emissions from civil aircraft 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.

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.
- **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.
- **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.

Aviation's Contribution to Climate Change

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*. The report's findings support the following:

- Aircraft released around 600 million tonnes of CO₂ in 1990.
- Aircraft accounted for 3.5% of global warming from all human activities in 1990.
- Aircraft greenhouse emissions will continue to rise and could contribute up to 15% of global warming from all human activities by 2050.
- Nitrogen oxides (NOx) and water vapour from aircraft engines are important greenhouse gases. Water vapour contributes to the formation of contrails, often visible from the ground, which in turn are linked to an increase in the formation of cirrus clouds. Both contrails and cirrus clouds warm the Earth's surface magnifying the global warming effect of aviation. Together, NOx and water vapour account for nearly two-thirds of aviation's impact on the atmosphere (IPCC estimated that radiative forcing from all aircraft greenhouse gas emissions is a factor of 2 to 4 times higher than that from its CO₂ emissions alone). Hence any strategy to reduce aircraft emissions will need to consider other gases and not just CO₂.

- 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, it concluded that improvements in aircraft and engine technology and in air traffic management will not offset the projected growth in aircraft emissions. In other words, fiscal and regulatory measures are required to further limit and reduce aviation's impact on climate.

Is The Industry Accountable?

Emissions from international aviation are specifically excluded from the targets agreed under the Kyoto Protocol. Instead, the Protocol invites developed countries to pursue the limitation or reduction of emissions through the International Civil Aviation Organisation (ICAO). ICAO's environmental committee continues to consider the potential for using market-based measures such as trading and charging, but this work is unlikely to lead to global action. It is currently developing guidance for states who wish to include aviation in an emissions trading scheme (ETS) to meet their Kyoto commitments, and for airlines who wish to participate voluntarily in a trading scheme. It is also looking at guidance on how charges can be applied to aircraft greenhouse gas emissions, although a recent ICAO Resolution prevents states from introducing a scheme for international aviation before 2007.

Emissions from domestic aviation are included within the Kyoto targets agreed by countries. This has led to some national policies such as fuel and emission taxes for domestic air travel in the Netherlands and Norway respectively. Although some countries tax the fuel used by domestic aviation, there is no duty on kerosene used on international flights.

A New Approach

Economic instruments and policies should be used to ensure that aviation fully meets its external environmental and social costs in full, while preventing it from benefiting from subsidies. This would also give airlines an added economic incentive to invest in the cleanest technology available. Using market-based measures to correct these market distortions is central to delivering a sustainable aviation policy.

In 1999, the European Commission produced a Communication on Air Transport and the Environment setting out a work program that included an examination of the role of emissions trading (ETS) and, more specifically, to present a proposal for a European aviation emissions charge. In recognition of aviation's international dimension, it confirmed that it would work initially through the International Civil Aviation Organization (ICAO), which at the time had established a working group on market-based options, but also signalled that European-wide action could be expected after 2001 if little or no progress was made. In our opinion very little progress, if any, has been made.

2005 therefore represents a significant opportunity to introduce European-wide measures to tackle aviation's impact on our climate. The European Commission will consult on a range of market-based options, likely to include charges, taxes and trading, and bring forward a Communication mapping the way forward. The Communication will draw on the results of the 1999 fuel tax study, the 2002 charges study, and the results of the current study by CE Delft on the inclusion of aviation in the EU emissions trading scheme. There is also growing political momentum across EU member states: the UK Government will use its Presidency in the second half of 2005 to tackle emissions from the aviation sector. Its 2003 Aviation White Paper commits the UK to pursuing the inclusion of intra-European flights in the EU emissions trading scheme by 2008 or as soon as possible thereafter. France and Germany have also been active recently in proposing a fuel tax on international aviation to fund international development, debt relief and HIV/AIDS and other health issues in Africa and Asia although, of course, this is bitterly opposed by the industry.

In developing its policy, it is essential that the EU builds its aviation and climate strategy around the following principles:

- That measures are introduced to address aviation's total impact on climate, not just a focus on CO₂.
- That any measure seeks the widest possible geographic coverage of emissions and has a clear timetabled strategy for so doing and that this includes looking at all emissions within European airspace alongside a commitment to resolve the issue of how to allocate emissions from international aviation to Parties under the UNFCCC
- Secures the full and urgent internalization of external costs, ensuring that aviation sector pays an appropriate amount of taxes and climate change emission levies as other economic sectors do. The authoritative overview of transport's external costs (INFRAS 2004) estimates the current external costs of air transport to be around E53 per 1000 passenger kilometres, and E271 per 1000 tonne kilometres for air freight. If imposed on ticket prices via a combination of an aviation fuel tax, en-route emissions charges and participation in a targeted ETS, this could begin to reduce the sector's impacts whilst still allowing sensible growth.
- Incorporates aviation emissions and their total climatic influence into an EU-wide policy to achieve Europe's CO₂ emission reduction targets for 2020, namely 30% below 1990 levels, to help stabilize greenhouse gas emissions and keep us on the path towards avoiding the very worst impacts of climate change.

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Graphic design: Sandro Kortekaas BNO, www.kortekaas-vormgeving.nl
Printing: Tienkamp en Verhey, printed waterfree offset on soya-based inks

