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Aviation Emissions and Climate Change

Aviation emissions and climate change

Balancing growth and environmental impacts

Issues Paper Themes

- > Taking practical steps now to reduce emissions
- > Measures the aviation industry should take, in the short to medium term, to reduce emissions, such as clean engine technology and clean aviation fuels
- > Opportunities to minimise emissions and trade permits through emission trading schemes and measures that might be effective in an international context

What the submissions said

Submissions recognised that aviation's contribution to climate change is an important issue with serious consequences for the industry if not properly addressed. Industry and the community acknowledge that aviation's contribution to total emissions is growing.

There was general industry support for the principles of emissions trading, providing the introduction of a scheme did not unduly affect Australia's ability to compete in the global market or create barriers to growth.

Industry submissions highlighted the measures that have already been implemented to reduce emissions in a number of operational areas. In addition, a number of submissions argued that Australian measures to address emissions from international aviation need to be consistent with those to be taken by other nations.

Submissions also suggested that, with the growing promotion of voluntary carbon offset schemes offered to passengers, the community believes these schemes need to be better regulated and accredited.

Broader Government policy on climate change

The Australian Government is committed to three key objectives in developing a strategy for managing greenhouse gas emissions from aviation:

- 1) ensuring the aviation sector's response is proportional to requirements for the economy as a whole through the broad application of the Carbon Pollution Reduction Scheme (CPRS);
- 2) supporting development of leading-edge technology to reduce aviation greenhouse gas emissions; and
- 3) encouraging the adoption of international measures which do not unfairly affect Australian aircraft operators' ability to compete in global markets and manage emissions.



Aviation emissions

All forms of transport – air, rail road and sea – contribute an estimated total of 13 per cent to global greenhouse gas emissions²⁵). Civil aviation (domestic and international) accounts for about two per cent of global emissions. However, the aviation industry's contribution is expected to increase significantly as the industry grows and passenger numbers increase.

A range of actions are currently being implemented or developed to reduce fuel use on individual flights, including the use of more fuel-efficient aircraft, more efficient flight paths and measures to reduce weight carried on aircraft. However, given the anticipated strong growth in demand for aviation services, these improvements will only partially constrain the industry's growing global share of emissions.

For Australia, an estimated 45 per cent of emissions relate to domestic aviation and 55 per cent to international aviation, based on fuel sales data for each category.

Industry capacity to manage emissions

The aviation industry is implementing a range of measures to reduce its carbon footprint.

The aviation industry's approach to improving performance in managing emissions falls into four categories.

- 1) advancing technology in aircraft design; air traffic management and alternative fuels;
- 2) improving the efficiency of aircraft operations;
- 3) supporting infrastructure improvements for both airports and airspace; and
- 4) recognising the potential role of economic measures.

All sectors within the aviation industry have an important role to play in taking action to manage emissions within their area of control.

Aircraft operators

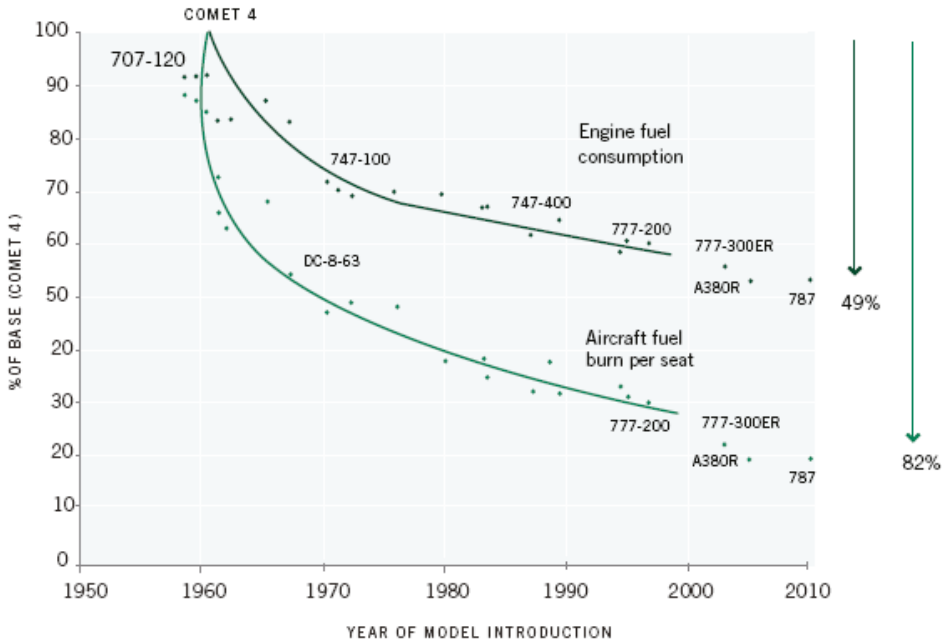
Aircraft are the largest source of greenhouse gas emissions within the industry. Aircraft operators can directly manage emissions by upgrading their fleet and by improving fuel efficiency through a range of sophisticated operational measures. The high cost of aviation fuel has already provided a major incentive for operators to improve fuel efficiency on individual flights, with corresponding reductions in emissions.

Figure 9.1 illustrates the historic improvement in aircraft fuel efficiency since 1960

²⁵ IPCC 4th Assessment Report 2007, WGIII Technical Summary

Figure 9.1 The historic improvement in aircraft fuel efficiency since 1960

Source: IPOC 1999 updated with 777-300ER, A380 and 787 data
 Source: 'Plane Simple Truth' (ISBN: 978-0-97522341-6-7), Geoffrey Thomas, Christine Forbes Smith, Guy Norris, Steve Creedy, and Rachel Pepper.



Voluntary offset schemes, such as those offered by Qantas, Jetstar and Virgin Blue, provide passengers with the opportunity to purchase offsets for their individual travel. These schemes can make a significant contribution to reducing aviation's net carbon footprint, and offer potential for further reductions if more customers take up the option to make their flights carbon-neutral. Recent results are encouraging, with both Jetstar and Virgin Blue reporting increased take-up, with more than ten per cent of passengers electing to pay for offsets.

The Government considers that voluntary offsets can continue to play a significant role. Further work will be done on mechanisms to ensure the reliability and credibility of such schemes, with attention to issues such as


- the mechanisms for calculating the emissions per passenger and offset charge required
- the mechanisms to ensure that the charges collected are applied to genuine emissions reduction activities, with proper reporting and verification.

Air navigation service providers

Airservices Australia is working with airlines to implement fuel saving measures on individual flights including flexible flight tracks, improving aircraft air traffic control sequencing and introducing continuous descent approaches. As a number of these measures depend on technology only available in the latest aircraft, their application should increase as airlines continue to upgrade their fleets.

Airports

While the activities directly controlled by airport operators are not a major source of aviation emissions, airport operators can reduce emissions with more energy-efficient designs for airport buildings and by switching to alternative lower carbon fuels. Additionally, airport operators can help aircraft operators and air navigation service providers improve the efficiency of gate-to-gate



operations.

The on-the-ground processing of aircraft is a key area where airports can contribute to improved efficiency of operations. This could be achieved by providing adequate and efficient taxiways, parking aprons and terminal gates; as well as installing ground power units and pre-conditioned air to reduce the use of aircraft auxiliary power units.

The policy framework

Key challenges

There are a number of realities that need to be faced in addressing the issue of greenhouse gas emissions from the aviation industry. With no alternative 'clean' fuel likely to be available in commercial quantities in the immediate future, aviation is expected to remain dependent on kerosene for some time.

While gains will continue to be made in aircraft design and operational efficiency, these will be outweighed by anticipated growth in services.

It will not be possible to reduce the absolute volume of carbon emissions from aviation without constraining services. Restraints on aviation services would have broader impacts on economic growth.

The Government recognises aviation is a vital mode of transport for many Australians, particularly in areas where there is limited opportunity to use other types of transport for longer journeys within, and beyond Australia.

The Government is also conscious of the importance of avoiding competitive distortion in the market. Measures need to be designed to ensure fair treatment among competing operators, particularly in international markets where there is competition between Australian and overseas-based aircraft operators.

Domestic Aviation and the Carbon Pollution Reduction Scheme

The Australian Government is committed to decisive national action on climate change to reduce greenhouse gas emissions, reduce the impacts of unavoidable climate change, and to help shape a global solution.


A key pillar of the Government's policy on climate change is marked by a commitment to a target of reducing emissions by 60 per cent of 2000 levels by 2050, and to a commitment to setting a medium term target before the end of 2008. The Government intends to achieve set targets through the introduction of the CPRS, an economy-wide scheme for capping and trading emissions, to be implemented in 2010.

A Green Paper on the proposed CPRS was released in July 2008, seeking community and industry input to the best ways to limit carbon pollution while minimising impacts on business and households.

Under the Scheme, a limit, or cap, will be placed on the amount of emissions that can be emitted across a wide range of significant polluting activities. Significant emitters of greenhouse gases will need to acquire a 'carbon pollution permit' for each tonne of greenhouse gas they emit, providing a strong incentive to reduce pollution.

Initiatives for managing emissions within the aviation sector will need to be consistent with a whole of Government approach to climate change.

Under the Kyoto Protocol, emissions from domestic aviation are included in the national emission reduction commitments for Australia. The Government proposes to include domestic aviation operations in the CPRS.



Under the CPRS, permits for emissions would be valid for emissions from domestic aviation or other emitting activities interchangeably. As the overall cap for permits reduces, trading will ensure that the emissions savings are made where they can most economically be met. Aviation services may continue to grow within the overall cap if the cost of permits can be met.

The Government, through the Department of Climate Change, will continue to develop the CPRS in consultation with industry and the community.

International aviation emissions

The Government is not proposing to include emissions from international aviation in the CPRS.

The Kyoto Protocol excluded emissions from international aviation services from national emissions targets, and stipulated that an approach to addressing emissions from international aviation should be developed separately through the International Civil Aviation Organization (ICAO).

ICAO has accepted responsibility for this task and has established a Group on International Aviation and Climate Change (GIACC), consisting of fifteen senior government officials, including a representative from Australia. This group will develop a program of action to recommend to a high-level ICAO meeting in 2009.

In contributing to the development of any global proposal for addressing international aviation emissions, the Government is conscious of the potential impact of these proposals on the competitiveness of Australian carriers, particularly given the long-haul nature of services to Australia and the price sensitivity of tourist markets. The Government will seek to ensure that differential impacts and competitive distortions which could unduly affect Australian carriers are avoided.

The Government has expressed support for work on a comprehensive package of measures, to be developed on a cooperative basis. The Government has also expressed concern at the prospect of unilateral action outside such a cooperative global framework, in particular at the current proposal to include international aviation in the European Union's Emissions Trading Scheme.


A resolution made at the 2007 ICAO Assembly, supported by Australia, requires 'mutual agreement' between countries in the application of market-based measures to reduce the greenhouse gas emissions from international aviation.

Outside the formal processes of ICAO, the Australian Government has been active in encouraging other governments to work cooperatively in addressing the challenges of aviation emissions. Through the APEC Transportation Working Group, Australia has sponsored two international seminars to boost understanding of the issues and options. The establishment of an Aviation Emissions Taskforce of APEC members flowed from these seminars. Airservices Australia continues to lead cooperative efforts between air navigation service providers in the Asia-Pacific region.

Aviation emissions and climate change – the way forward

The Government proposes to work with industry to develop an effective policy framework to respond to climate change, with a focus on the following elements:

- Finalising the design of the CPRS, including application of the scheme to domestic aviation;
- consideration of means to support the uptake of operational and other measures to constrain the net carbon footprint of aviation, which complement the actions taken in the CPRS;
- continuing the initiatives of Airservices Australia to work with airlines on the implementation of fuel saving measures including flexible flight tracks, improving aircraft



air traffic control sequencing and introducing continuous descent approaches;

- working through ICAO on a practical approach to address international aviation emissions;
- working towards a better understanding of aviation emissions and their impact, including through the development of tools for comprehensive carbon monitoring and foot printing; and
- assisting all economies in the region to respond to the need to reduce their carbon footprint through Australia's bilateral agreements and our involvement in APEC and ICAO.