**Air Travel Emissions Understated**
**Ben Rose, 2007**

Less than 1/6th of Australia's actual greenhouse gas emissions from air travel are officially reported, because:

- Kyoto Protocol greenhouse gas national inventory reporting only accounted for the emissions that would be produced if aviation turbine fuel were burned in at ground level, essentially emitting only CO2. The greenhouse effect of the nitrous oxides, ozone and contrails produced by jets at high altitude are not accounted for.
- Only domestic flights are included in the inventories; international flights are not accounted for.

Total radiative forcing (greenhouse effect) of aircraft emissions is 2-4 times that of CO2 alone (International Panel on Climate Change, 1999). A figure of 2.7 is cited by the IPCC as most likely for the current aviation scenario. This fact is ignored in the National Greenhouse Gas Inventory.

Officially, Australia's aircraft emissions were reported under the National Greenhouse Gas Inventory as: "Domestic aviation contributed 6% - 4.8 million tonnes of transport emissions." This equates to about 0.8% of Australia's total emissions.

Table 1 below shows that when international flight kilometers are added (estimated by the Author from ABS international arrivals and departures statistics), this figure rises to about 11.5 million tonnes.

For travel by jet aircraft, the latest version of GHG-Energy Calc (a calculator produced by the Author, available on the Carbon Neutral website) uses a multiplier of 2.7 times the global warming potential (GWP) of CO2 emissions from burning aviation turbine fuel on the ground. This is one of the lower scenarios listed in the IPCC 'Aviation *and the Global Atmosphere'* report. (http://www.grida.no/climate/ipcc/aviation/068.htm.) Using this multiplier to arrive at a figure for actual global warming potential caused by Australian domestic and international flight kilometers, the figure is about 31 million tonnes CO2e. This is about 6.5 times higher than that officially reported in the National Greenhouse gas Inventory, and equates to about 5.2% of Australia's total emissions.

As a result of the current under-reporting, the real global warming impacts of air travel are not officially recognized by Government. Consequently, national greenhouse reduction strategies and public awareness campaigns ignore air travel and the level of community awareness of the impacts is still low.

Added to this are the current advertising campaigns by airlines offering cheap emissions offsets. The most misleading (even fraudulent) aspect of these campaigns is that flight emissions are grossly understated by using the AGO emission factor based on aviation turbine fuel burned on the ground rather than actual global warming impact of jet aircraft in flight at high altitudes.

Australians travel, on average half as far by air as we do by car. The average distance per head of population traveled by air is about 4940 km per year (derived from ABS international and domestic travel data, 2003), compared to about 9,900 km traveled by road. (ABS, 2005). About 69% of international flights are for holidays.

**Table 1. Estimation of emissions from air travel by Australians, derived from ABS published statistics, 2003**

| Derived from ABS stats | Domestic | International | Total | TOTAL million t |
|---|---|---|---|---|
| Million passenger km | 34,643 | 64,252 | 98,895 | |
| Average km air travel (20 million population) | 1,732 | 3,213 | 4,945 | |
| Thousand litres of fuel(2) | 1,850,000 | 2570080 | 4,420,080 | |
| Tonnes CO2e using AGO figure for turbine fuel burned at ground level | 4,810,000 | 6,682,208 | 11,492,208 | |
| Total tonnes CO2e using the 2.7 times multiplier for jet aircraft in flight (IPCC, 1999) | 12,987,000 | 18,041,962 | 31,028,962 | 31 million t |

*Notes:*

1. *Fuel use was estimated using 4L/1000 passenger km for international and 5.3L/ 1000 km for domestic flights.*
2. *Emissions were estimated @ 2.8 tonnes CO2e / 1000 L fuel (AGO, 2005) and multiplied by three to include emissions from nitrous oxides and contrails (IPCC, 2000)*

Air travel continues to grow due to its low cost, and the lack of alternative bus and train services on longer routes. There are several reasons for the low cost of air travel, one being lower labour costs due to shorter travel times. However, another major reason is that there is virtually no tax on aviation turbine fuel. Under a 1930's international agreement, it is levied at only a few cents per litre compared to, for example 38c/L for road transport fuels in Australia and over 80c/L in Europe. If a 38c/L levy were applied to aviation turbine fuel this mean a price increase of about 40%.

If a carbon cost of $30-40 per tonne CO2e were applied (the current European 'cap and trade' abatement scheme does not apply to air transport) the cost of aviation turbine fuel would rise by a further 10%. It can be argued that taxes reflecting 'intangibles', including environmental, public infrastructure and health costs should be added. It can also be argued that a GST or VAT tax should be applied to the whole cost of tickets worldwide. This would raise the cost of jet fuel to well over 50% higher than current levels and would 'level the playing field' in line with road fuel costs. Rising crude oil prices will add to this. As fuel comprises about 30% of the cost of flying, fares would be expected to rise by over 20%. However, with the popularity of overseas holidays and increasing affluence of the 'haves' of this world, it is unlikely that even a doubling of ticket prices would be sufficient to curtail the growth in air travel.

In view of the already significant contribution of aviation to global warming and the 'deep cut hard emission targets' that are already being set by some nations, it is likely that other more equitable measures will eventually need to be taken to restrict air travel.

References:

IPCC, 1999. *Aviation and the Global Atmosphere, Ch 6.1.3 Aviation Scenarios Adopted for Climate Assessment.* http://www.grida.no/climate/ipcc/aviation/068.htm

Rose, 2007. *GHG-Energy Calc – Background Paper.* www.carbonneutral.com.au