

Air Technology

Despite greater efficiency in aviation transport over the past two decades, aviation's share of emissions has increased from 3-4 % in 1990 to around 8% of all transport emissions today (Graham, P., Gargett, D., Evans, C., Cosgrove, D., Ritzinger, A. 2012, p.6). This indicates a rapidly growing aviation transport sector. While air freight transport represents only a small percentage of domestic freight movement within Australia, with an expanding import and export market reducing aviation's emissions will be important if Australia is to meet its emission reduction standards by 2050.

In the industry's drive to reduce emissions two specific technological combinations will be utilized more so than others, fuel efficiency improvements and the use of sustainably produced alternative fuels.

Expected Developments

Improving fuel efficiency is already a major program that aviation engineers and designers have looked to improve. Major advances throughout the years have already ensured that new models are about 20% more fuel efficient per passenger kilometre than the aircraft they replace, and 70% more fuel efficient over the original commercial jets (www.tiaca.org). With current technology being utilised and gradually replacing older airplanes, it is estimated that a 30% decrease in aviation energy can be achieved by 2050. A combination of advances in lower carbon fuels, greater aircraft efficiency and greater operational practises however could reduce GHG emissions by more than 50% over what would be expected by 2050 with current technology roll-out (CSIRO, 2012).

Due to the rapid rising cost of aviation fuel and its expense on airline companies, it can be expected that major investment will be continued towards emerging aircraft technologies which should increase the uptake of newer aircraft that meet these expectations.

With only so many options available to reduce drag on the current aircraft modal, it has been suggested that a major rethink on design might be needed to further reduce emissions. Blended wing bodies could allow much greater efficiency through reducing drag through a combination of less outer contact and a design which allows the whole aircraft to generate lift. It will be many years before such technology becomes commercially available. While this technology is showing more and more promise, it requires substantial air safety testing that before it ever gets rolled out commercially.

Alternative Fuels for Aviation

Outside aircraft design, the use of alternative fuels such as biofuels has been examined as a possible way to reduce GHG emissions, once they are harvested in a sustainable manner.

The Australian Low Carbon Transport Forum estimates the use of biofuels in aviation fuel is likely to have greater abatement potential by 2050 than advancement in aircraft design. As previously stated this will all depend on the production of the biofuel. CSIRO suggest that by 2050 Australia would be well positioned to sustainably produce enough aviation biofuel, but full uptake may be limited due to competition from other industry sectors (CSIRO, 2011).

If Australia is to meet its targets, it will be through the advancement and roll-out of a combination of these technologies. The rising percentage cost of aviation fuel of an airlines expense will likely increase the rate of technology uptake but government policies as well as funding of research and development will be crucial to reducing total emissions of a growing industry.