AUSTRALIAN BIOFUELS COULD TRANSFORM AIRLINE INDUSTRY AND CREATE JOBS

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This week Virgin Australia and Air New Zealand held a conference with the biofuel industry after joining forces to investigate options for locally produced biojet fuel for their domestic and international routes.

This striking step signals the two airlines' intention to aggregate their purchasing power in order to reduce their reliance on a single fuel, while at the same time significantly reducing their carbon emissions. Jet fuel, a petroleum distillate, has been used to power air travel since the first flights in the 1940s because of its high-energy density and thermal stability. And each year, the world's airlines burn about 300bn litres, which represents about 10% of global oil consumption.

Although electric, solar or hydrogen power systems will be deployed in light, short-haul aircraft within the next decade, it will take much longer for the mass-transport, commercial aviation market to adopt them. Engines, aircraft as well as fuel storage and distribution infrastructure are all designed specifically to handle jet fuel and many technical, safety, reliability and infrastructure challenges still need to be overcome for these sources to become viable alternatives.

The Virgin Australia/Air New Zealand search for biofuel options demonstrates that they are on the look out for solutions. Biojet is a so-called drop-in fuel that is compatible with existing engines and

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infrastructure, and it recycles carbon rather than emitting “new” fossil carbon.

The two airlines seek supply for 10 years, beginning in 2020, of 200m litres of biojet fuel a year. This is about 5% of their projected fuel consumption. This is a significant market given that jet fuel costs for Virgin Australia added up to about $1.1b in 2015.

Moreover, they seek this supply from up to five bio refineries, located across Australia and New Zealand, none of which exist currently.

Air New Zealand and Virgin Australia issued the RFI (request for information) in partnership to strengthen the demand signal to the biojet industry. Aviation currently contributes only 3% of manmade carbon dioxide emissions per year but relative and absolute emissions will continue to increase unless the projected growth of up to 5% of the industry each year is decoupled from fossil carbon emissions.

Additionally, they see biojet supply as a way to increase business resilience by increasing diversity, security and price stability of their energy supply, given fuel accounts for 20% to 50% of an airline’s operating costs.

They are also aware of measures such as the Australian government’s emissions reduction fund safeguard mechanism, which requires the largest emitters, including airlines, to keep emissions within baseline levels from 1 July 2016.

The international aviation industry as a whole is committed to change. The International Air Transport Association (IATA) has set targets for an annual average increase in fuel efficiency each year from 2009 to 2020 of 1.5%; carbon-neutral growth from 2020; and reduction in emissions of 50% of the 2005 figures by 2050.

The UN’s International Civil Aviation Organisation (ICAO) has similar ambitions. This year the ICAO assembly will vote on a recommendation for a global market-based measure to cap aviation’s net carbon emissions from 2020.

To achieve these targets, all international airlines have adopted IATA’s strategy of improved technology, more efficient aircraft operations, infrastructure improvements , and a single global market-based measure.

They are looking to biojet to play a significant role. The global industry is requesting 4bn to 5bn litres of biojet each year from 2020, at prices competitive with petroleum jet fuel.

Over in the US, the federal aviation administration wants 5% of the jet fuel consumed each year from 2018 to be biojet. This represents US$2.5bn of the US$50bn that US airlines spend on jet fuel each year.

Like conventional jet fuel, biojet must meet stringent technical specifications and tough environmental standards, including lower CO_2 emissions compared to jet fuel, which is not an easy task.

There are several certified pathways to biojet, including the hydroprocessed esters and fatty acids (HEFA) pathway that produces biojet from oil seed crops, animal fat or microalgae. It can used in up to a 50:50 blend with petroleum jet fuel.

This was the fuel that Air New Zealand used in 2008 when it became the second airline in the world to conduct a test flight on biojet. In 2012, Qantas and Jetstar used HEFA to demonstrate the

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potential of biojet on regularly scheduled commercial flights. These and many other airlines have conducted commercial flights on this and other types of biojet without incident.

Yet despite strong global signals, policy incentives and certification of four additional biojet production pathways, viable cost-competitive biojet production facilities have been slow to materialise.

While it seems like a painstaking process, there have been some indications that a biojet industry may yet get off the ground.

In January this year, the US navy launched the great green fleet in which each ship is deploying energy efficiency measures, renewable diesel and biojet.

Then in March, United Airlines became the first US airline to fly regularly scheduled flights powered by biojet. The airline will use up to 15m gallons of biojet, produced in Los Angeles from inedible agricultural waste fats and oils. And the Total-Amyris program continues to use biojet manufactured in Brazil for commercial flights in Europe and Brazil, and has been tested by Air France, Etihad and Lufthansa.

This new partnership between Air New Zealand and Virgin Australia is a welcome signal to the domestic market that it is not too late for Australia and New Zealand to enter the field.

Earlier this month the Queensland premier, Annastacia Palaszczuk, announced that Southern Oil's pilot plant would produce 1m litres of fuel annually from waste lube oil and renewable feedstocks for use in field trials by the Australian navy and the great green fleet. Along with the biofutures roadmap and the 10-year action plan, Queensland is clearly positioned as a leader in the biofuels industry.

On a national scale, the Australian Renewable Energy Agency has consistently provided support to low-emissions biofuels projects around Australia, as has its New Zealand government counterpart.

Additionally new bio refineries, which produce products for a wide range of markets in addition to the fuels market, would generate economic growth, new manufacturing jobs and help to revitalise rural communities.

So while Australian and New Zealand airlines are demonstrating their willingness to be innovative and early adopters of biojet fuel, now it is up to the market to respond.

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