Sustainable Aviation Fuel Alliance of Australia and New Zealand

Bioenergy Australia (Forum) Pty Ltd
ABN 14 155 856 821
[redacted]

SUSTAINABLE AVIATION FUEL ALLIANCE OF AUSTRALIA AND NEW ZEALAND, Bioenergy Australia

Future of Australia's Aviation Sector - November 2020

The Sustainable Aviation Fuel Alliance of Australia and New Zealand (SAFAANZ) is a working group developed by Bioenergy Australia to provide a collaborative environment to advance sustainable aviation fuel production, policy, education and marketing in Australia and New Zealand.

Bioenergy is a cross-sector solution, which can support the country in facing environmental and socio-economic challenges. Minister Taylor recently committed to the development of a Commonwealth Bioenergy Roadmap and we strongly encourage the Department to engage with the team working on this to fully understand the opportunities for sustainable aviation fuel development in Australia. In addition, several reports and IEA articles have been developed recently that highlight the significant opportunity to develop a Sustainable Aviation Fuels industry in Australia. These include:

Biofuels & Transport: An Australian Opportunity – A special report from the CEFC and ARENA
IATA – Developing Sustainable Aviation Fuel
Are Aviation biofuels ready for take-off? IEA

The SAFAANZ acknowledge the efforts made through the State Action Plan on managing Australia's aviation carbon emissions, however we encourage the Government to significantly increase its engagement and support in this area. Now is the time to drive the development of a domestic sustainable aviation fuels industry in Australia.

Thank you for the opportunity to provide this submission

Yours sincerely

[redacted]

Shahana McKenzie
Chief Executive
Bioenergy Australia

The aviation sector has limited low emissions options. Accordingly, biofuels have potential to make a significant impact while also helping to address waste challenge and building new regional industries.

Developing a Sustainable Aviation Fuel (SAF) industry in Australia would:

- offer **large scale abatement potential** - SAF offer significant life-cycle carbon reduction gains (at least 70%) and are cleaner burning, with up to 90% reduction in particulates.

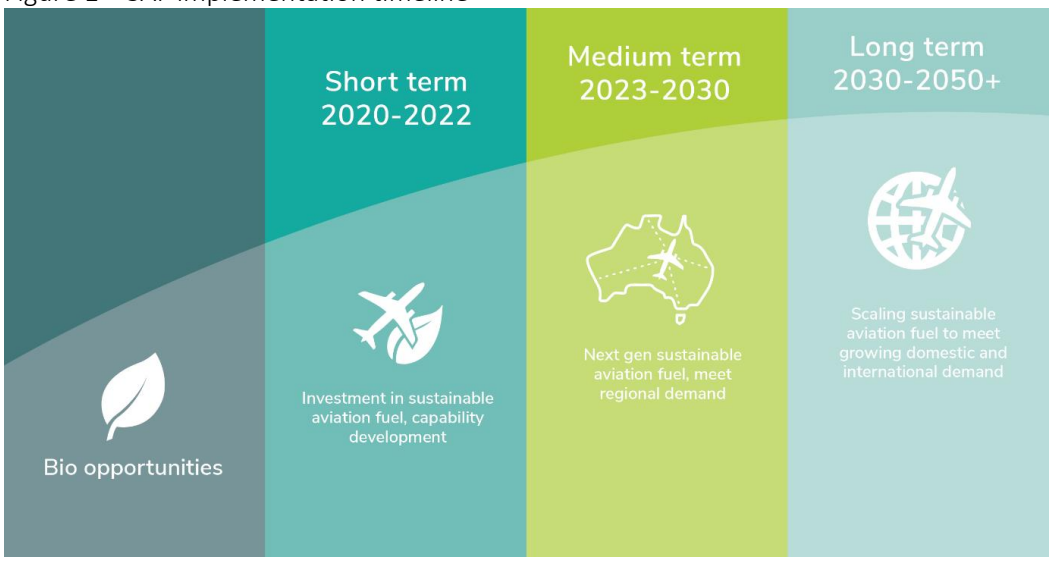
- deliver **large scale economic opportunity** - The Sustainable Aviation Fuel Roadmap estimates that by 2035, the development of a domestic industry for the production of sustainable fuels could generate a Gross Value Added (GVA) of up to £742m annually and support up 5,200 jobs in UK.

- leverage **Australian comparative advantage**, through utilisation of existing feedstocks and infrastructure, enhancing domestic fuel security, driving a new export industry and supporting significant investment in regional Australia.

- Capitalise on **existing proven technology** operating at scale globally.

- Be **commercially viable**, with the right policy settings as shown globally.

Figure 1 – SAF implementation timeline



Sustainable Aviation Fuel – A Global snapshot

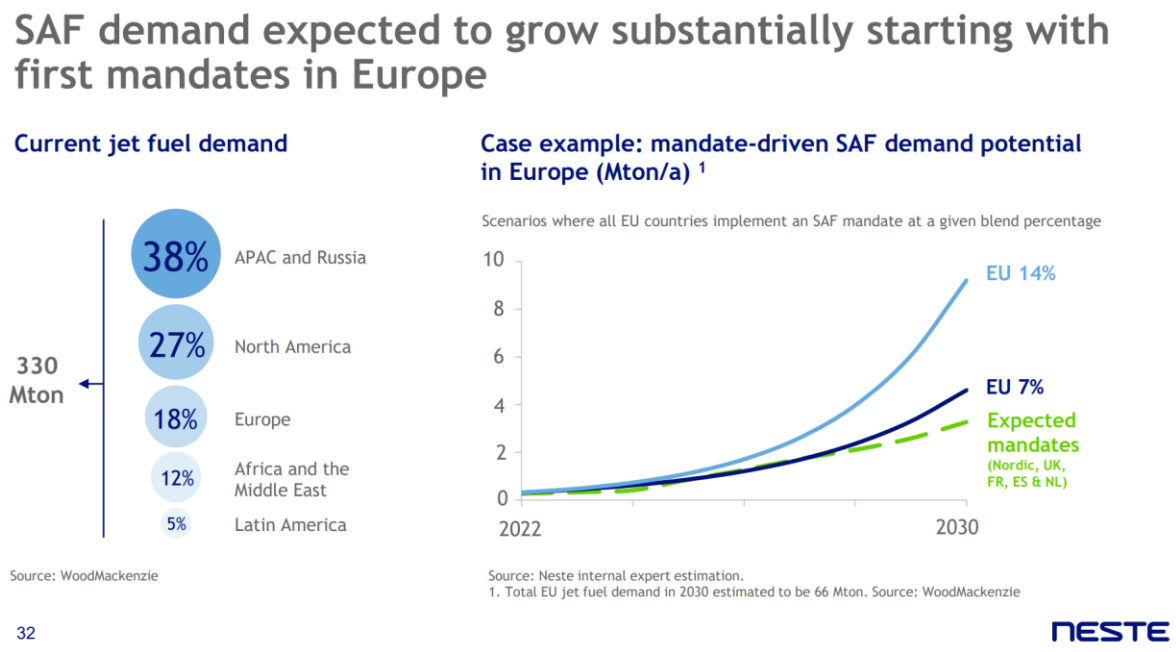
- Over 250,000 flights have taken to the skies using SAF since 2016
- Seven technical pathways exist
- 40 million litres of SAF will be produced in 2020 – this represents 0.015% of total jet fuel
- SAF can reduce emissions by up to 80% during its full lifecycle
- Around 6 billion litres of SAF are in forward purchase agreements
- More than 40 airlines now have experience with SAF

What does the Commonwealth Government need to do to unlock a new SAF industry in Australia?

Due to the unique challenges presented to decarbonisation by the aviation industry, sector-specific policies are instrumental to incentivise the use of SAF. Policy directives have been implemented across America and Europe to support the development of the industry. In addition, we have seen SAF leveraged as a significant opportunity for economic growth coming out of COVID.

The new Atlantic Council report by Fred Ghatala, "Sustainable Aviation Fuel Policy in the United States: A Pragmatic Way Forward", provides a set of near and long-term federal policy options that could be implemented in order to encourage the use of SAF. The report contextualizes each policy choice and explains the implications of each option, differentiating between policies that can be implemented in the near-term and policies that require long-term implementation.

With the Norwegian Mandate now implemented in Europe, requiring 30 percent sustainable content in aviation fuel by 2030, further mandates are expected, starting in Europe, and spreading globally. This will significantly impact demand for SAF as is demonstrated in the graph below.



Today sustainable aviation fuel is at a global tipping point, with a number of projects on the verge of commercial-scale production and a number of airlines and some fossil fuel companies now making investments in sustainable aviation fuels through joint ventures. As an example, in November 2016, Fulcrum and BP formed a major strategic partnership that included a $30 million equity investment in Fulcrum by BP and a 500 million gallon jet fuel offtake agreement with Air BP, the aviation division at BP, that will provide Air BP with 50 million gallons per year of low-carbon, drop-in jet fuel. Velocys has also recently announced that resolution to grant planning permission has been given to Altalto Immingham, the UK's first commercial waste-to-jet-fuel plant, which will be built in collaboration with British Airways and Shell. The Sustainable Aviation Fuel Roadmap developed by Sustainable Aviation estimates that in 2035 there may be between 14.5 and 30.9 million tonnes per year of sustainable aviation fuels produced globally. This would correspond to 4%-8% of global aviation fuel use.

Domestically, the Qantas Group flew Australia's first commercial flight using SAF in 2012 and the world's first SAF flight between the United States and Australia in January 2018 using carinata as the feedstock, in partnership with Canadian agricultural seed company, Agrisoma. In 2013, the Group undertook a feasibility study with Shell and ARENA, that found an aviation biofuel industry is technically viable in Australia however investment in feedstock and infrastructure as well as a supportive enabling environment was essential to the development of an advanced SAF industry in Australia. In 2019, the Qantas Group set a target to achieve net zero emissions by 2050 and will invest $50 million over the next ten years to help develop a sustainable aviation fuel industry.

In October 2017, Virgin Australia Group announced a trial of sustainable biofuel through Brisbane Airport's jet fuel supply infrastructure. This was the first time a sustainable fuel type would be delivered through a traditional fuel system at an Australian airport. In September 2018, Virgin Australia announced the completion of the trial, with the biofuel blend fuelling 195 domestic and international flights out of Brisbane Airport. Brisbane Airport's Draft 2020 Master Plan highlights their intention to continue to work with airlines to expand the use of biofuels for aviation. This partnership and trial demonstrate the capacity for airport stakeholders to co-deliver emissions reduction initiatives.

In addition, the formation of the Sustainable Aviation Fuel Alliance of Australia and New Zealand and the significant membership of this being Australian Airports gives a strong indication of the support for developing the sector.

Why should the Commonwealth Government invest in driving SAF?

Declining regional economies and the need for regional investment

For several decades now, as Australia's economy has grown, rural and regional Australians have been further and further shut out from prosperity. An ACTU submission describes how Australia has developed a two-speed economy, with vastly different economies developing in metropolitan and regional Australia. Regional Australians are already experiencing significantly higher levels of insecurity and inequality when compared to people living in metropolitan areas. This issue will only worsen in the future if future of work transitions are not managed adequately.

As widely demonstrated by results achieved internationally, the development of a strong bioeconomy can provide skilled employment opportunities to regional areas. The International Renewable Energy Agency (IRENA) 2019 review shows the global employment in the bioenergy sector has grown in the last few years, reaching 3.18 million jobs in 2018.

A US Department of Agriculture (USDA) report "An Economic Impact Analysis of the US Bio-based Products Industry (2018)" analyses the economic impact of the biobased products industry on the US economy. Results show that an expanding bioeconomy leads to higher revenues, more jobs, innovative partnerships, and key environmental benefits. The total contribution of the bio-based products industry to the US economy in 2016 was $459 billion, a 17% increase from 2014, and it was employing 4.65 million workers (direct and indirect), an increase of more than 10% from 2014.

The Sustainable Aviation Fuel Roadmap developed by Sustainable Aviation estimates that by 2035, the development of a domestic industry for the production of sustainable fuels could generate a Gross Value Added (GVA) of up to £742m annually and support up to 5,200 jobs in the UK. A further 13,600 jobs could be generated from the growing market for sustainable aviation fuels through global exports.

Fuel Security and Infrastructure compatibility

The COVID-19 pandemic has highlighted vulnerabilities in Australia's supply chains and has provided Australia with the opportunity to consider increasing domestic manufacturing and value adding for reduced reliance on imports and enhanced self-sufficiency.

Australia is languishing behind other nations in fuel independence and security and has been named the least prepared developed nation to deal with such a crisis. In terms of aviation fuel, Australia's domestic production of aviation fuel has almost halved over the last 10 years according to the interim report of the Commonwealth Governments Liquid Fuel Security Review and we hold approximately 23 days of jet fuel, putting us behind the OECD Americas, OECD Europe and OECD Asia/Oceania countries.

Domestic production of biofuels results in less reliance on imported oil and petroleum products thereby promoting energy security. A strong biofuel industry can help diversify the sources of transportation fuels and decrease Australia's dependence on petroleum imports, which will reduce the risk of supply constraints during times of international or regional geopolitical upheaval.

Although technologies are under development to market new hybrid-electric and all-electric aircrafts, these solutions are still decades away. Decarbonisation options are required for the short to medium term to enable the sector to meet global industry targets of carbon neutral growth from 2020 and a 50 per cent reduction in emissions by 2050 from 2005 levels. The CEFC report "Clean energy and infrastructure: Pathway to airport sustainability" concluded liquid fuels are projected to remain the most commonly used fuels in the aviation industry as they have high energy-density and are convenient to store and handle. SAF is an essential decarbonisation opportunity for the industry.

In addition, infrastructure can also be a limiting factor for decarbonisation of aviation. Airports are complex infrastructure assets, with the implementation of new emissions reducing initiatives typically requiring endorsement from multiple stakeholders. Airports can facilitate the transition to biofuels by ensuring that their fuel storage and delivery infrastructure is compatible with the strict certification requirement of sustainable aviation fuels to enable them to be used as "drop in" fuels. SAF can often be added into the existing fuel pipelines, including by blending SAF with jet fuel, however it must be tested to ensure it meets the global ASTM certification. With this existing infrastructure in place, airports can further incentivise aircraft biofuel uptake by removing internal or contractual barriers to the use of biofuels.

Higher order waste and resource recovery solutions required

The 2018 National Waste Report estimates that in 2016-17 Australia produced 67MT of waste with 13.8 MT being Municipal Solid Waste (MSW). Approximately 42% of this material went to landfill, creating poor environmental outcomes, including large greenhouse gas emissions. Instead, in accordance with the waste hierarchy, waste should be recovered for its highest order use wherever it is economically feasible to do so.

As an example, Fulcrum BioEnergy, based in California, U.S.A., is leading the development of a reliable and efficient process for transforming municipal solid waste – or household garbage – into transportation fuels including jet fuel and diesel. Fulcrum began construction on the Sierra BioFuels Plant located in Nevada, U.S.A in late 2017. The Sierra plant is the first commercial-scale waste-to-fuels plant in the United States. In December 2018 Fulcrum announced that it has chosen Gary, Indiana, U.S.A., as the location for its Centerpoint BioFuels Plant, the company's second waste-to-fuels plant.

British Airways has partnered with Shell and Velocys to construct an advanced fuels facility that will annually convert around 500,000 tonnes of household and office waste left over after recycling into a number of sustainable low-carbon fuels, including aviation fuel. This waste would otherwise be destined for landfill and incineration. The plant, Altalto, will be located in Immingham in north-east Lincolnshire on what is currently vacant land surrounded by existing industrial buildings. The fuel production process is fundamentally different to incineration: instead of being burnt (with energy recovery in the form of electricity), the carbon in the waste is converted into a fuel for use in aircraft or vehicles.

Resource availability and quality

The major feedstocks for bioenergy are crop and forestry residues, processing residues and wastes, and purpose-grown crops. As shown in the Australian Renewable Energy Mapping Infrastructure (AREMI) platform, these resources are abundant in Australia but are currently underutilised. In addition, there are large tracts of undeveloped, unproductive agricultural lands, especially in the NT and WA. Australia has a natural advantage in the development and deployment of biofuels whereas it has a natural disadvantage in mineral hydrocarbons for liquid fuels.

Strong economy, highly skilled workforce, strong financial and governance systems to support investment

Australia has a number of socio-economic and financial advantages that make the country a safe and secure place to do business. We can count on an effective regulatory environment, a highly skilled workforce, and Australian businesses are innovative and world leading with a high level of confidence and growing investment.