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## Bioenergy Australia submission into The Defence Sub Committee on Foreign Affairs and Trade

Bioenergy Australia is the national industry association, committed to accelerating Australia's bio economy. Our mission is to foster the bioenergy sector to generate jobs, secure investment, maximise the value of local resources, minimise waste and environmental impact, and develop and promote national bioenergy expertise into international markets.

Following Bioenergy Australia's participation in the Defence Sub-Committee of the Joint Standing Committee on Foreign Affairs and Trade we would like to provide the following information to support Defence considering sustainable and renewable fuels in its future strategic fuel security agenda.

Given it was identified at the hearing that 65% of Defence fuels used domestically are aviation fuels the focus of this submission is related to sustainable aviation fuels, however the principles included in this submission are applicable across marine/road etc. Broadly, we encourage policies that recognise the importance of biofuels in displacing traditional fuels. We firmly believe that provides a mechanism to increase the strategic fuel reserves for Civil and Defence, through in-country fuel production and a reduction in fossil fuel usage. Biofuel can include bioCNG, bIoLNG, renewable diesel, ethanol and bio-methanol amongst other bio-based sourced energy that can displace fossil fuel usage in Defence, transport, aviation, power generation, off-road mining and agriculture.

Thank you for the opportunity to provide this submission

Yours sincerely

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Shahana McKenzie, CEO Bioenergy Australia

## *WHY SHOULD DEFENCE BE PROGRESSING A SUSTAINABLE FUEL AGENDA*

### *Global movement to Renewable Fuels, in particular through Defence*

There is an established history of international countries driving the development of biofuels by placing firm long-term offtake agreements particularly with the military to establish stable local suppliers of non-fossil fuels for the assets. This is even more relevant now as countries are progressing rapidly to renewable fuels.

These include

- The U.S. Navy great green fleet initiative
    - US Department of Defence's commitment to source 50 percent of the military's energy from alternative fuels by 2020. In 2010, the Department of the Navy established Task Force Energy, the Great Green Fleet demonstration that included the use of a range of biofuels including diesel and aviation fuels, a reduction of non-tactical petroleum use by 50 percent; production of 50 percent of on-shore energy from alternative sources by 2020; and ensuring that 50 percent of Navy and Marine Corps installations will be net-zero by 2020
- In the UK, algae, alcohol and household waste will power RAF fighter jets under bold Ministry of Defence plans to slash carbon emissions. Aircraft including F-35s, Typhoons and Wildcat helicopters currently use conventional fuel, but could use up to 50 per cent sustainable sources in the future, after MOD's changed aviation fuel standards came into effect in November 20The MOD's move to allow up to 50 per cent sustainable fuel marks a huge shift in global fuel consumption and opens the door for thousands of civilian and military aircraft to be fuelled with Sustainable Aviation Fuels (SAFs).Not only do Australia and several NATO countries rely on the UK's standards to influence what fuel they use, but civil and commercial airlines in the UK follow the defence standard as there is no commercial equivalent
- The Indian Airforce
    - Jan 2019 the use of indigenously produced biofuel for military aircraft has been cleared after months of exhaustive ground and flight trials. The Indian Air Force is expected to use biofuel for its transport fleet and helicopters following the clearance given by the Centre for Military Airworthiness and Certification (CEMILAC).
- The Netherlands Airforce
    - The Netherlands airforce wants to gradually increase the mixing percentage and ultimately have all of its flying equipment fly on a mixture of biofuels. In
    - 2030 the airforce must therefore be 20% less dependent on fossil fuel. In 2050 this must be 70%
- The Netherlands coast guard
    - After intensive testing for more than a year, the Netherlands coast guard decided to roll out GoodFuels sustainable biofuels across the entire coast guard fleet. Their feedback is that it works flawlessly.

### *Interoperability*

Australia's working relationship with joint international manoeuvres requires our assets to operate on a similar flexible range of biofuels. As the rest of the world advances in this area, Australia risks being left behind. Interoperability was presented as a barrier by the Defence representatives at the inquiry, we would argue the complete opposite, in that we will not be able to operate with our major

partners, when other nations are moving to blended stock and we have not. This could cause challenges with joint missions, training activities etc.

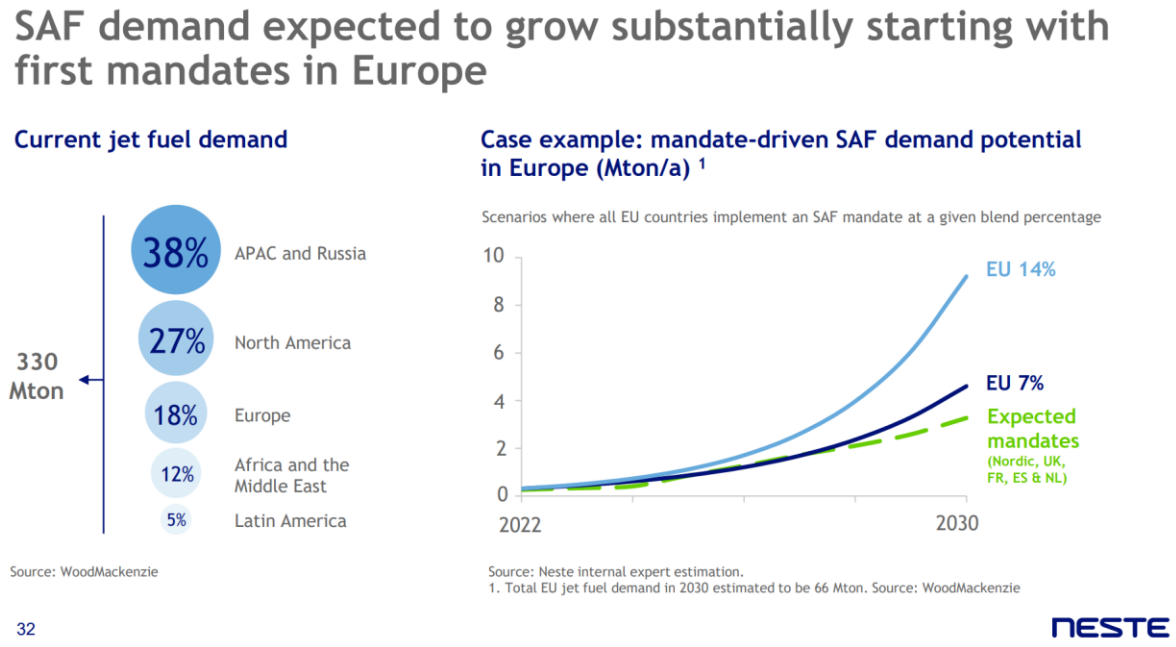
Certification of fuels is not a cost to Defence, this is a cost born by the fuel producer. This was also referenced as a concern from Defence. This is inaccurate as it is a requirement of fuel producers to meet the standard or fuel specification.

### *Increased government policy driving investment*

Due to the unique challenges presented to decarbonization by the aviation industry, sector-specific policies are instrumental to incentivise the use of SAF. Policy directives are implemented across America and Europe to support the development of the industry and could be replicated in Australia with specific measures and instrument to support our unique market characteristics.

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.




### *International coalitions driving sustainable aviation fuel deployment*

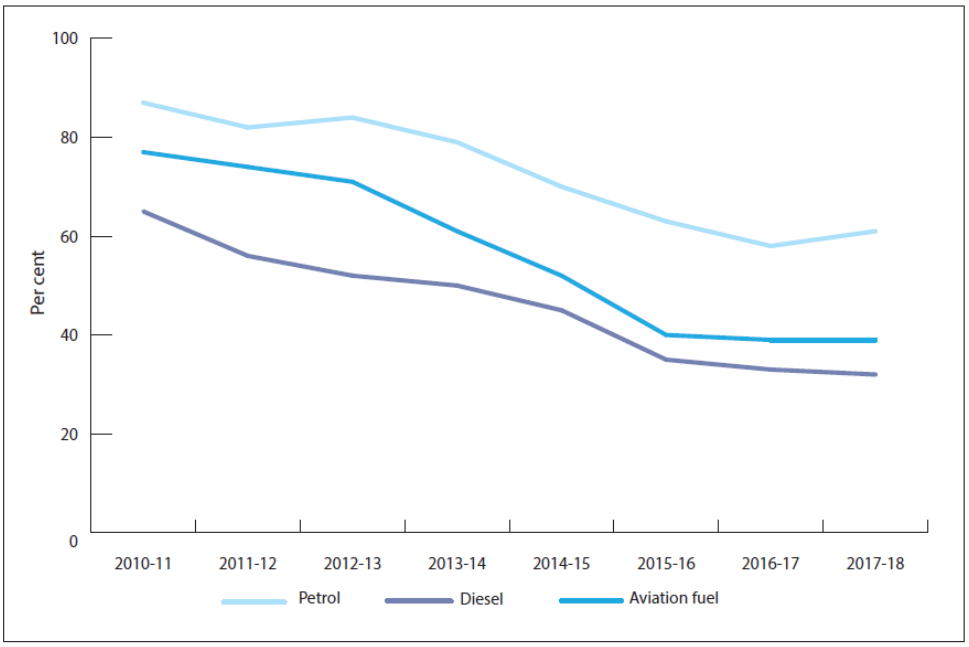
The aviation sector currently contributes 2 per cent to global emissions, therefore, in June 2018, the International Civil Aviation Organization (ICAO) established a set of international standards for its Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). The global aviation industry has committed to carbon neutral growth from 2020 and a 50% reduction in CO2 emissions by 2050 (relative to 2005 levels). Sustainable aviation fuels offer significant life-cycle carbon reduction gains (at least 70%) and are cleaner burning, with up to 90% reduction in particulates.

### *Lack of self-sufficiency and energy security*

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. This figure has changed recently with COVID, however when aviation resumes at full capacity it is likely to revert to similar statistics.

**Figure 12: Portion of domestically produced major fuel types as part of overall fuel consumption in Australia, 2010–11 to 2017–18**




Source: DoEE 2018b

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.

The defence force advised at the inquiry that their fuel use is less than 1% of Australia's total fuel sales. Based on pre-Covid fuel sales this equates to a maximum of 570ML pa of which 65% was jet fuel (370ML) leaving a maximum of 200ML of Diesel.

Defence force total needs could easily be supplied by biofuels feedstocks in Australia

- Our exports of canola to Europe and tallow to Singapore are utilised to make 1.4 BL pa of biodiesel and renewable diesel for other countries now. These products are exported as there is no market here to promote conversion / refining to biofuels,
- Our sugar exports alone could be used to make 2 BL pa of ethanol that could be converted to SAF jet fuel via Alcohol to jet technology

- CSIRO estimates Australia to produce 100MT pa of biomass by 2030 sufficient for 30 BL pa of ethanol

More information on the role of biofuels in supporting the national fuel security is provided here.

### *Traditional fossil based fuel suppliers investing in SAF*

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 are 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.

### *Australian domestic airline industry committed to the development of the industry*

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 develpoment 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.

### *Inflexibility of existing infrastructure, asset life and global compatibility*

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.

### *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 5,200 jobs in UK. A further 13,600 jobs could be generated from the growing market for sustainable aviation fuels through global exports.

More information on bioenergy opportunities in regional areas is provided here.