ADVANCING AUSTRALIA'S SUSTAINABLE AVIATION FUEL INDUSTRY TO REACH NET-ZERO EMISSIONS

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I AVIATION EMISSIONS CONTRIBUTION

Growth of airline traffic has prompted a global response given the aviation industry is responsible for producing 2.1% of global carbon dioxide emissions which account for approximately 3.5% of all global warming impacts.[1] Global aviation emissions are expected to increase significantly as air transport demand is predicted to rise by 4.3% per annum and because of efforts by other industries to reduce their carbon footprint.[2]

The Federal and Queensland Government are aware of this issue and have since implemented the Queensland Biofutures program and the Emissions Reduction Fund. Current policies focus on revolutionary technology solutions such as electric and hydrogen powered aircrafts; however, these technologies are not in the near future in terms of long-haul and commercial flights.[3] Thus, sustainable aviation fuel (**SAF**) is one of the few options to reducing aviation emissions in the short to medium-term.[4]

Further policy frameworks, cooperation from local governments and stakeholder collaboration are required to ensure the successful development of SAF in order to meet Australia's Nationally Determined Contribution under the Paris Agreement and targets set by the International Civil Aviation Organization (**ICAO**) Carbon Offsetting and Reduction Scheme for International Aviation.

II SUSTAINABLE AVIATION FUEL

Sustainable aviation fuel is the blanket term used within the industry to describe fuel derived from sustainable sources other than fossil fuels. As a 'drop-in' fuel, SAF is blended with conventional jet fuel and is compatible with existing engine, aircraft and fuel distribution systems.[5] SAF has potential to reduce lifecycle emissions by 80% compared to conventional jet fuel.[6] Thus, its deployment is critical to achieving net-zero emissions by 2050.[7]

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[1] Air Traffic Action Group 'Fact Sheet 2: Aviation and Climate Change', *Aviation Benefits Beyond Borders* (Fact Sheet, October 2020) <https://aviationbenefits.org/media/167159/fact-sheet_2_aviation-and-climate-change.pdf>.

[2] 'Future of Aviation', *International Civil Aviation Organization* (Web Page) <https://www.icao.int/Meetings/FutureOfAviation/Pages/default.aspx>.

[3] 'Sustainable Aviation Fuels Guide – Version 2', *International Civil Aviation Organization* (Report, December 2018) <https://www.icao.int/environmental-protection/Documents/Sustainable%20Aviation%20Fuels%20Guide_100519.pdf> ('Sustainable Aviation Fuels Guide').

[4] EnergyLink Services, 'Bridging the Price Gap for Sustainable Aviation Fuel', *Bioenergy Australia and the Sustainable Aviation Fuel Alliance of Australia and New Zealand* (Report, March 2022). <https://www.bioenergyaustralia.org.au/report-bridging-the-price-gap-for-sustainable-aviation-fuel-cop/>.

[5] Sustainable Aviation Fuels Guide – Version 2 (n 3).

[6] 'Beginners Guide to Sustainable Aviation Fuel', *Air Transport Action Group* (3 November 2017) <https://aviationbenefits.org/media/166152/beginners-guide-to-saf_web.pdf>.

[7] EnergyLink Services (n 4).

Several feedstocks are currently being used to produce SAF, including municipal waste, waste gases, agricultural residue, non-biological alternative fuels, cooking oils and plant oils.[8] Nine certified processes have been approved for SAF production.[9] Approved processes such as alcohol-to-jet and sugar-to-jet may not be desirable given the food versus fuel dilemma and cultivation concerns.[10] However, municipal waste, vegetable oil and energy oil feedstocks are ideal for SAF production in Australia with the right policy frameworks.[11] The feasibility of constructing SAF plants has also been challenged; however, existing refineries can be used to co-process SAF, renewable diesel and naphtha to reduce costs.[12]

SAF production has the potential to provide national fuel security and economic growth through creating jobs and exporting SAF to other countries.[13] Further, Queensland is well positioned to produce and export SAF given it offers a direct gateway to the Asia-Pacific.

Currently, SAF is not being produced in Australia. National airlines committed to reducing carbon emissions are purchasing SAF offshore and have called for government support to establish the SAF industry in Australia.[14]

III RECOMMENDATIONS

A *Federal Government*

In a recent report, four recommendations were suggested to bridge the price gap between conventional jet fuel and SAF which appears to be the most significant barrier to introducing SAF in Australia.[15] Firstly, a 'Jet Council' should be established to accelerate and guide the development of sustainable aviation policies, support pathways for SAF research and production, and assist with SAF industry barriers.[16] The 'Jet Council' would work with various levels of Government and aviation stakeholders.[17] Secondly, a national framework for a voluntary consumer purchasing program should be established by State and Federal Governments to give customers the choice to purchase SAF for their flight.[18] Lastly,

[8] Ibid.
[9] 'Conversion Processes', *International Civil Aviation Organization* (Web Page) <https://www.icao.int/environmental-protection/GFAAF/Pages/Conversion-processes.aspx>.
[10] Stephen Doliente et al. 'Bio-aviation Fuel: A Comprehensive Review and Analysis of the Supply Chain Components'(2020) 8(110) *Frontiers in Energy Research.*
[11] EnergyLink Services (n 4).
[12] Susan van Dyk and Jack Saddler, 'Progress in Commercialization of Biojet / Sustainable Aviation Fuels (SAF): Technologies, Potential and Challenges' *IEA Bioenergy* (May 2021) <https://www.ieabioenergy.com/wp-content/uploads/2021/06/IEA-Bioenergy-Task-39-Progress-in-the-commercialisation-of-biojet-fuels-May-2021-1.pdf>.
[13] EnergyLink Services (n 4).
[14] 'Sustainable Aviation Fuel', *Qantas Group,* (Web Page) <https://www.qantas.com/au/en/qantas-group/acting-responsibly/our-planet/sustainable-aviation-fuel.html>; Natalie Clarkson 'Virgin Atlantic agrees sustainable aviation fuel supply with Neste and ExxonMobil' *Virgin Atlantic* (Web Page, 9 February 2022) <https://www.virgin.com/about-virgin/latest/virgin-atlantic-agrees-sustainable-aviation-fuel-supply-with-neste-and>.
[15] EnergyLink Services (n 4).
[16] Ibid.
[17] Ibid.
[18] Ibid.

Governments should consider funding mechanisms through new funding bodies such as the proposed 'Jet Council' and SAF emission intensity mandates should be implemented.[19]

B *Queensland Government & Local Governments*

Additional funding from the State Government such as loans, partial funding, production subsidies and tax credits will be necessary for successful development and deployment of SAF in Queensland.[20] Procedures to streamline development assessment processes should be implemented to encourage investment in the SAF industry and reduce delay costs.[21] Local governments should work with the State to identify suitably zoned land close to feedstock and supply chain infrastructure to help establish biofuel precincts for SAF production.[22] A review of Queensland's Waste Management Strategy and recovery trends will be necessary to assess feedstock availability for SAF production in various regions.[23] Lastly, additional waste recovery infrastructure may be needed for feedstock procurement, particularly municipal solid waste.[24]

[19] Ibid.
[20] The Department of State Development, Manufacturing, Infrastructure and Planning (Qld), *Queensland Biofutures 10-Year Roadmap and Action Plan,* Second Edition (2016).
[21] Ibid.
[22] Sustainable Aviation Fuels Guide – Version 2 (n 3).
[23] Ibid.
[24] Sustainable Aviation Fuels Guide – Version 2 (n 3); Queensland Treasury Corporation, *Economic Opportunities for The Queensland Waste Industry: Final Report* (2018).