**Low Carbon Solutions Australia**
**ABN: 86658188866**

30 November 2023

Director, Aviation White Paper Project Office
Aviation White Paper
Department of Infrastructure, Transport, Regional Development, Communications and the Arts
GPO Box 594
Canberra ACT 2601

RE: Aviation Green Paper submission – Sustainable Aviation Fuel input

I am providing this submission having worked in the downstream fuels industry for the past 32 years across four countries. I recently spent 3 years in the US working for an energy company as the North America Compliance Manager responsible for all the biofuels programs, carbon reduction mandates, and business development for low carbon fuels.

I am currently working as an independent consultant in Australia to provide advice and input on low carbon fuels strategies, policy design, and development opportunities. With this level of expertise I am providing this submission in response to the Aviation Green Paper.

Before discussing SAF, it is important to clearly understand what it is. SAF is jet fuel which uses a proportion of sustainable feedstock in place of conventional crude-oil feedstocks for manufacture. The sustainable feedstock is called synthesized kerosene (SK) as the manufacturing process 'synthesises' (makes) the kerosene component from the sustainable feedstock according to aviation regulations. To meet jet specifications SK is blended with petroleum jet fuel at concentrations up to 50% with the result being SAF. For simplicity, the term SAF will be used here for both the synthesised kerosene and the blended jet fuel.

SAF as a liquid fuel has the potential to reduce life cycle $CO_2$ emissions by up to 80%. According to IATA, SAF could contribute around 65% of the reduction in emissions needed by aviation to reach net-aero in 2050. This is consistent with the Green Paper which defines SAF as the most advanced means to support aviation meeting the objective of net zero by 2050, as it uses mature technologies that integrate with existing and new turbine powered aircraft and can be scaled.

In response to the questions on P73:

- What are the benefits and risks associated with updating the NGER scheme and/or other policy mechanisms to enable unique claims on SAF sourced through common infrastructure? How can risks be managed?

Scope 1 emissions from the combustion of jet fuel are used as the primary measure of in-country emissions reported by airlines in Australia in NGER. Whilst the combustion emissions are a large proportion of the total emissions through the supply chain, the full sustainability impact of SAF blended jet fuel should consider all the sources of emissions including those related to direct and indirect land use change. This is done using a lifecycle assessment ([CA). The full supply chain impacts of for the production of SAF needs to be compared to petroleum jet fuel so the total emissions reduction benefits can be effectively quantified.

In July 2023 renewable aviation kerosene (RAK) was added as a reportable fuel type under the NGER Scheme with scope 1 emissions factor for combined gases of 0.61 kg$CO_2$-e/GJ (providing a zero factor CO2 as is the approach across all biofuels) in comparison to petroleum jet (kerosene) at 70.82 kg$CO_2$-e/GJ. The use of SAF blends will enable airlines to report lower scope 1 emissions from fuel combustion in aircraft.

The emissions associated with the supply chain for petroleum jet fuel and SAF up to combustion are scope 1 emissions for other parties and will be included in their NGER submissions for reporting entities. For example, a fuel refinery will need to report their own emissions associated with the production process, whether it is supplying petroleum jet fuel or SAF. The use of [CA for evaluating emissions reduction from the use of SAF should have no impact on what is reported in NGERs. The two systems can co-exist.

Australia will need to consider what [CA method it will use to underpin emissions reduction claims associated with SAF, with various existing methodologies that could be used as a foundation including GREET (US), GH Genius (Canada), and CORSIA (ICAO). For SAF, the most likely option is to use the CORSIA methodology. While an [CA approach is proposed, the same certification system can also support emissions reporting under NGERs, with the relevant emission data for SAF combustion based on the NGER treatment as a biofuel.

- What types of arrangements are necessary to support industry confidence in the quality standards and sustainability certification of SAF?

As defined in the Green Paper, biofuels can emit more greenhouse gases than some fossil fuels on an energy-equivalent basis, depending on production process and time horizon of analysis.

A certification scheme underpinned by a robust sustainability standard is essential to provide assurance of decarbonisation outcomes and mitigate unintended consequences. A certification standard provides an avenue for the attributes of SAF to be substantiated and tracked, providing a basis for both producers and consumers to have confidence in the claims they make about SAF. The attributes of SAF are supported by data provided according to agreed standards, including emissions and other sustainability criteria. Examples of international certification programs include CORSIA and SAF certificates.

Having a government backed certification and sustainability scheme is essential for SAF production as it provides trust and credibility both locally and internationally, particularly where the scheme is designed to underpin compliance with regulated policy. This ensures the appropriate resources are allocated to the scheme and there is long term commitment to its effectiveness.

- Should policy and regulatory settings be refined to support development of domestic SAF production capability and industry take-up of SAF?

Australia is well positioned with a diversity of feedstock to be able to develop an industry which will improve liquid fuel security, create new jobs, and provide low carbon fuels necessary to lower emissions. This can only be done with long term stable government policies, which will provide confidence for the significant investment needed in this industry.

Technology to produce SAF is readily available today, and the production of SAF into existing supply chains and aircraft can reduce emissions in the near term. This is in contrast to hydrogen or e-fuels for aviation which can only be considered as longer term options.

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| Government should consider supporting the development of low carbon fuels including SAF with similar enthusiasm and funding as there is for the Hydrogen Headstart program. |

The types of policies that will support a SAF market in Australia includes:

1. a low-carbon fuel standard for all transport fuels which will stimulate demand, provide measurable domestic emissions reduction, and spread the cost across consumers.
2. defining a percentage SAF mandate for domestic airlines to create a level playing field and ensure production of low carbon fuels for all transport modes.
3. government research grants and subsidies for development of feedstocks for fuels including non-food based cover crops.
4. government grants, subsidies and partnerships with industry for biorefineries.
5. supply side support measures such loan guarantees.
6. tax incentives to produce SAF with domestic feedstock which creates an alternative to exporting feedstock.
7. reviewing fuel excise arrangements to incentivise low carbon fuels.

Potential feedstocks for low carbon fuels are mostly originating in regional and rural areas, so the development of a SAF industry will generate employment and economic development in regions and across supply chains.

For any SAF mandates, there must be a market-based approach where SAF can be supplied via shared facilities and claims can be separated from the physical SAF. This provides economies of scale for the supply for SAF and does not add increased cost burden to supply SAF in all airports, particularly in rural areas.

- What are the current and future challenges in developing an Australian SAF production industry, including challenges associated with growing, refining and consuming feedstocks?

The biggest challenges for feedstocks in Australia includes lack of domestic demand, no incentives to supply into a domestic biofuels market, and inadequate commitment for research into use of feedstocks. Implementing long term policies as listed above will enable the growing, refining and use of feedstocks for SAF production.

Should you wish to discuss any of the above, please contact me directly by email.

Yours sincerely,

Peter Gunthorpe
Managing Director

Peter.Gunthorpe@nuffieldgroup.com