

Submission to *Aviation Green Paper: Towards 2050*

About Licella

Licella Holdings Limited (Licella) is a global technology pioneer in advanced chemical recycling of plastic and biomass. Licella's patented Catalytic Hydrothermal Reactor (Cat-HTR[™]) is the world's most advanced hydrothermal liquefaction (HTL) technology – the next-generation of advanced recycling. HTL chemically transforms low value feedstocks into a high-quality oil, which can be refined into high value sustainable and renewable fuels and chemicals. Licella have successfully scaled up the Cat-HTR[™] platform over a 15 year period at its pilot facility in Somersby NSW to its current commercial ready stage. With more than \$120M invested in the technology, several commercial projects are underway globally for the chemical recycling of end-of-life plastics, and in Canada, to upgrade low value biomass streams to advanced biofuel and biochemicals.

Summary

Licella commends the government on its green paper as a step towards an Aviation White Paper that sets the policy direction for emissions reduction within the aviation sector. Licella is strongly supportive of the Government's commitment to achieve net zero emissions by 2050 and the reforms to the Safeguard Mechanism requiring annual emission reductions from airlines. We are delighted to read about Minister Catherine King's commitment to supporting the new skills and innovation that are needed to deliver these targets and underpin a sustainable aviation sector. A strong policy framework will be essential to support the development of a local Sustainable Aviation Fuel (SAF) industry and underpin long-term investment confidence in this emerging sector, alongside building industry awareness and social licence. Licella strongly supports the establishment of the Jet Zero Council to galvanise, champion and coordinate the industry's development and advocate for an appropriate funding and policy framework.

Maximising aviation's contribution to net zero

Licella wish to reinforce the importance of decarbonising the aviation sector for Australia to achieve its commitment to net zero carbon by 2050. Aviation is a 'hard-to-abate' sector in the push towards decarbonisation, however, SAF is well positioned as one of the main levers to reduce aviation emissions in the immediate and longer term.

Investment & policy to support an emerging industry

Building a local SAF industry will require significant investment from the government, both to accelerate investment and development of the sector. The scale of the investment needs to align to programs such as the \$2 billion in Hydrogen Headstart program. This program is an excellent example of how the government, through bodies like ARENA, can provide funding credit to cover the commercial gap between the cost of producing SAF and its market price. This would drive pull through for the industry by allowing SAF producers to offer SAF to users at a price that encourages its use. Given that first-of-kind facilities that will allow for scalable production of SAF, including via Licella's HTL platform, will cost more than subsequent facilities. This is where government will need to support the industry's development with grants and other forms of funding (via bodies such as the NRF and NAIF, where applicable).

In parallel, the government must set obligations for renewable content in fuels, including via SAF, and ensure that these obligations are enforced. The government should consider how airlines will meet

their obligations and which carbon credits schemes can be used. Attention should be given to the quality of carbon credits. Potential mechanisms for considerations could include a quota for major airports to use SAF and placing a levy on airplane tickets to encourage the uptake of SAF. The revenue generated by these mechanisms, similar to Europe, could be used to support the emerging SAF market (building more capacity to allow for the price of SAF to reduce over time).

To allow for the market to develop, a phased approach to obligations on SAF could be taken. While still setting clear timelines to underpin investment confidence in the sector and accelerate development of new local facilities.

Other ways to manage a price premium on SAF is with long-term offtake agreements via value chain collaboration. The government is also well positioned drive demand of SAF through government procurement.

We need to address the economics of biofuels in Australia to support this emerging industry. Australia spends \$10B a year to subsidise the fossil fuels industry. We disagree with fossil fuel subsidies that incentivise the use of fossil fuels over biofuels. For example, in the current market, users can get 48c back on diesel (via an excise) – however on biodiesel, users only get 24c back. Clearly the economics to support decarbonisation for transportation fuel, including aviation, need to be addressed, otherwise we will not achieve net zero carbon by 2050.

Feedstocks

A significant advantage of Licella's HTL technology is the ability to process lignocellulosic feedstock. As such, our Cat-HTR™ platform can process all the residual components of feedstocks such as sugarcane (excluding the ash, which is inert). This is a significant advantage over the current pathway of Ethanol to Jet (EtJ) which relies on extracting the sugar from the cane to produce ethanol. While second generation EtJ claims to extract ethanol from more components of cane (not just sugar cane but also cellulose and hemicellulose components), we are not currently aware of anyone developing these technologies in Australia. The technology is also in its early stages in markets such as India, where it is being looked at for rice straw (Pragj Industries).

In forming a policy framework to support the development of a new local SAF industry, consideration must be given to the biomass feedstocks used to produce the SAF. Attention should be given to the food vs fuel debate, alongside land use with regards to feedstock. To ensure the long-term viability of this new industry, feedstock that does not compete with food (for example, sugarcane residues not used in food production) should be prioritised to ensure the scalability required to achieve SAF obligations, as well as to ensure the industry develops and maintains a social licence to operate for the industry.

Licella would like to highlight the opportunity to maximise the biomass resources we already have by using the waste and residue streams of sugarcane as feedstock for SAF production. Utilising residues supports the social licence of these biofuels, as it makes best use of resources already available and does not compete with the food industry. We can utilise the wastes not needed for food production, and this avoids the issue of competing with land used for food crops. It also helps divert sugarcane residues from lower value use like energy, or from non-environmentally friendly disposal such as burning on the field (as occurs with sugarcane tops and trash in the Burdekin region).

Traceability and certification

Licella strongly agrees that robust certification arrangements to provide assurance of SAF environmental and safety credentials are essential.

Licella is currently pursuing certification of SAF produced from its Cat-HTR[™] biocrude applied to sugarcane residues, including bagasse and tops and trash.

Traceability of the feedstock source is another critical consideration to underpin the success of a new SAF industry in Australia. Ensuring that the provenance of the feedstock is certified will underpin the confidence in SAF products selling with a green premium. There are a number of schemes that could be considered including ISCC or RSB (Roundtable on Sustainable Biofuels). There is also the potential to include SAF within the Guarantee of Origin (GO Scheme). Alongside this, the CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) framework offers a harmonized way to reduce emissions from international aviation and can apply to feedstock and agricultural practices.