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Catalysing sustainable aviation fuel (SAF) in Australia

Deloitte.

Queensland Government

FOREWORD

Global climate change issues are driving the transition to sustainable aviation fuel (SAF) and demand is increasing as airlines are publicly committing to achieving net zero emissions by 2050.

There is a significant opportunity to establish a multi-billion dollar SAF industry in Australia which will diversify and add value to our economy, especially in regional areas, help improve our economic complexity, and reduce the impact of macroeconomic shocks. Queensland in particular has plentiful bio-based feedstock, world-leading R&D, well progressed trials, and end-to-end supply chain elements.

Growing local production capabilities and establishing SAF value chains is a key priority of the Queensland Government through our Queensland New-Industry Development Strategy, the Queensland Energy and Jobs Plan and the Queensland Biofutures 10-Year Roadmap and Action Plan.

The Queensland Government commissioned Deloitte to review international policy settings that have supported development of commercial scale SAF value chains. The purpose of the analysis is to identify possible policy and industry settings for establishing a domestic value chain within Australia, and the roles that State and Federal governments, industry and consumers could play.

WHY GROW THE SAF INDUSTRY?

THE OPPORTUNITY – DEMAND FOR SAF

SAF is an alternative to fossil derived aviation fuel, and can be made from a range of feedstocks such as tallow, ethanol or solid municipal waste. It is a drop-in fuel meaning its chemical and physical characteristics are almost identical to those of conventional jet fuel and it can be safely mixed with the latter to varying degrees (currently up to 50%), uses the same supply infrastructure and does not require adaptation of aircraft or engines. Litre for litre it can reduce carbon emissions by up to 80%.

Aviation contributes approximately 2.5% of global emissions. While electrification and hydrogen offer medium-term solutions for shorter flights, SAF will be required for flights over 1,000km. In Australia, this is two-thirds of domestic flights and all international flights.

Globally, many airlines have committed to a “net zero by 2050” target. In Australia, Qantas has committed to using 10% SAF in its overall fuel mix by 2030 and around 60% by 2050.

Annual Australian demand for jet fuel has averaged 7,700 million litres (ML) over the last five years and is growing. SAF blended with fossil-based aviation fuel at 10% would mean Australia alone will need around 770 ML per year based on current domestic demand, which will increase with growth in global travel. It is estimated global demand for SAF could underpin a worldwide industry worth approximately $14–23 billion by 2030. As SAF is blended at higher rates over time this demand will increase.

QUEENSLAND IS WELL POSITIONED TO GROW A SAF INDUSTRY AND IS INVESTMENT-READY

Queensland is internationally recognised as one of the best locations to establish an Australasian SAF supply chain because it already produces significant SAF feedstock such as tallow, sugarcane and cropping residues, with potential to grow new feedstocks such as pongamia and carinata.

Growing local production capabilities and establishing SAF supply chains continues to be a key priority under the Queensland New-Industry Development Strategy, the Queensland Energy and Jobs Plan and the Queensland Biofutures 10-Year Roadmap and Action Plan.

The Queensland Government is working with industry across the value chain and across the state to establish and accelerate SAF production. Recent highlights include:

VALUE CHAIN DEVELOPMENT

The Queensland Government and Qantas are collaborating under a Memorandum of Understanding to develop a SAF industry.

PRODUCTION, STORAGE AND DISTRIBUTION

Ampol and Japanese energy giant ENEOS teaming up under a Queensland Government Memorandum of Understanding to conduct a feasibility study for an advanced biofuels manufacturing plant in Brisbane. The proposed facility could generate up to 500 million litres of sustainable aviation fuel each year.

REGIONAL PRODUCTION

Along with Qantas and Airbus, the Queensland Government is supporting Jet Zero to undertake a feasibility study for a facility in Queensland that could produce more than 100 million litres each year.

NEW FEEDSTOCKS

Licella completed its feasibility study, working with the University of Queensland and Burdekin Renewable Fuels, to turn sugarcane waste into biofuel.

NEW TECHNOLOGIES

Mercurius successfully completed its pilot at the QUT Biocommodities Facility in Mackay using its patented REACH™ technology to produce chemicals, diesel and SAF from sugarcane waste.

DELOITTE REPORT KEY THEMES

SAF IS A KEY PART OF GLOBAL DECARBONISATION

SAF is critical to decarbonising the hard-to-abate aviation sector globally and could account for a 50% reduction in the aviation sector's emissions between now and 2050. It is already widely in use and is being produced commercially today in Europe and North America.

CHALLENGES IN CREATING A SAF INDUSTRY IN AUSTRALIA

There are six market challenges:

1. **SAF is 2–5 times the cost** of fossil fuel and the cost premium must be reduced to enable scaled domestic offtake.
2. **Building trust in SAF** decarbonisation outcomes through transparency and validation of emissions reduction claims.
3. **Facilitating technology-neutral** aviation decarbonisation – enabling competition between technologies for the best outcomes.
4. **Delivering SAF projects** at pace and scale.
5. **Global policy interventions** have put Australia at a competitive disadvantage – there's a need to re-level the playing field for Australian SAF projects.
6. **Competition for feedstocks** comes with opportunity cost for the economy – it's a choice between remaining a low complexity feedstock exporter or investing in projects that will create a local value add.

COLLABORATION IS NEEDED TO DEVELOP A SAF VALUE CHAIN

Australia's SAF industry is still in its infancy and this is unlikely to change on the scale needed to support decarbonisation without government intervention and a proactive industry.

There is no single policy which can support a SAF value chain – a range of complementary policies that address both supply and demand are needed to deliver outcomes. Globally, a range of policy levers have been implemented to support the SAF industry including:

Market mechanisms that signal demand, such as a low carbon fuel standard applied to all fuels, which rewards production and use of renewable fuels. This type of demand signal could only be effectively implemented as a national scheme.

Measures to address the SAF cost premium, such as time limited production credits through the income tax system or capital grants, which support supply by addressing operating expenditure and revenue challenges for early mover projects. Such measures could be implemented by either or both the federal government and state and territory governments. There is also a place for customers to meet part of the cost premium and some businesses are already partnering with airlines to do this.

Industry also needs to work together and with government. For example, to develop the value chain, help government to develop practical policies and, importantly, build trust in SAF decarbonisation and safety claims.

Collaboration is the key to standing up a domestic SAF industry and the Australian Government, state and territory governments and industry all have roles to play.