

30 November 2023

Department of Infrastructure, Regional Transport and Regional Development

Sent via: aviationgreenpaper@infrastructure.gov.au

To whom it may concern

RE: *Aviation Green Paper*

The Australian Sugar Milling Council is pleased to provide this submission to the Government's *Aviation Green Paper*. Our comments relate to the de-carbonisation objectives of the aviation sector and Sustainable Aviation fuel specifically.

With access to feedstock, technology, capital and infrastructure, the sugar milling sector is well equipped for, and already makes bio-fuels and is well placed to invest in additional bio-fuel supply capacity – including SAF.

However, while we share the Government's ambitions to grow bio-fuels further, the absence of an economy-wide carbon price will continue to create considerable supply and demand side uncertainties and constraints to developing bio-fuels at scale that will require various Government interventions.

Our submission is that, for Australia to take advantage of the very significant emerging opportunities for substitute bio-fuels, there must be a suite of integrated State (Queensland) and Federal policies that support production scale to increase the competitiveness of bio-fuels compared to traditional fossil sources and reduce price gaps. This is likely to require:

- Demand side interventions such as progressive and enforceable mandates (targets) that compels refiners to purchase various bio-fuels in pre-defined quantities (like the U.S biofuel blending mandate program and Low Carbon Fuel Standard). In this context additional SAF supply could be incentivized through a bio-fuels blending mandate policy that compels refiners to purchase pre-defined quantities of certain types of bio-fuels (of which ethanol is one type of pre-defined bio-fuel). In turn ethanol and all other types of eligible biofuels eligible would be required to be purchased and depending on market forces, this ethanol will go to its highest value use – be that E10 for road transport, or for SAF, or diesel etc; and
- Support for producers by way of:
 - ongoing support for RD&D and commercialization of emerging technologies,
 - production incentives that help achieve commercial rates of returns.
 - foundation customers such as the Australian Defence Force that enter into offtake agreements to purchase the initial, high-cost bio-fuel supplies of SAF for example to enable production scale.
 - education and incentive purchase programs for final consumers of biofuels.

There are also regulatory constraints to mills investing in bio-fuels and for industry to expand

sugarcane and bio-fuel feedstock supply that are unique to the sugar industry that also require solutions.

Furthermore, we support ongoing facilitation of the Australian Jet Zero Council (and adequate resources and co-ordination to undertake the Action Plan) and bi-partisan policy support to support investment certainty.

Our full submission is overleaf. Areas of focus include:

- The sugar milling operating context;
- Defining a 'sustainable' liquid fuel and addressing certain threats;
- The sugar industry's biomass feedstock availability;
- The nature of the bio-fuel market opportunities;
- Current domestic climate policy settings do not incentivise bio-fuels;
- General barriers to bio-fuels investment;
- Further barriers to bio-fuel investment and additional cane supply that are unique to the sugar industry; and
- The need to align policy options to investment requirements.

Please don't hesitate to contact David Rynne, Director Policy, Economics & Trade at david.rynn@asmc.com.au or phone 0431 729 509 for further clarification on the issues raised in this submission.

Yours sincerely



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ASMC SUBMISSION

Introduction

The Australian Sugar Milling Council (ASMC) is the peak industry organisation for the raw sugar manufacturing sector. We represent sugar manufacturing companies which collectively produce 85 percent of Australia's raw sugar.

The Australian milling sector in 2022 had annual production of:

- 4.2 million tonnes of raw sugar at 22 mills from 32.4 million tonnes of cane received;
- 1 million MWh's of green co-generated electricity from 440MW's of installed co-generation capacity;
- 1 million tonnes of molasses; and
- 60 million litres of ethanol from the Sarina distillery for domestic E10 and other industrial usage consumption.

In 2023, sales of raw sugar, exported electricity, molasses and ethanol generated around AUD\$2.5 billion in revenue for the Australian milling sector with returns reinvested locally into the maintenance and upgrades of sugar mills.

In 2021, the Queensland sugar industry (cane growers and raw sugar millers) employed around 20,000 people and contributed around AUD\$4 billion in Queensland Gross State Product¹.

The Australian milling sector has a long history of producing bio-fuels with the ethanol distillery operating in Sarina since 1927.

The sugar milling operating context

The milling sector has four core operational objectives to improve the viability of the entire Australian sugar industry and to continue its significant socio-economic contribution to regional Queensland (refer box below).

¹ <https://asmc.com.au/sugar-industrys-economic-contribution-2020-21/>

Australian milling sector operational objectives

- (1) Achieve consistently higher levels of cane supply and full utilisation of milling assets. This can be achieved, inter alia from improved cane variety development and adoption; improved farm extension and adoption; and horizontal expansion of cane land. In Queensland, the objective is to reach 34 million tonnes per annum (mtpa) and Australia wide 36 mtpa (by comparison, Australian cane supply in 2022 was 32.4 mt);
- (2) Earn higher revenues from its raw sugar sales. This can be achieved by accessing higher-returning markets and promoting a level (global) playing field, free of trade distorting subsidies;
- (3) Achieve higher utilisation of existing (co-generation) power and ethanol plant. In relation to ethanol, this can be achieved by promoting strong Queensland regional demand for ethanol through appropriate enforcement and oversight of the 4% ethanol mandate. Complementary consumer awareness campaigns may also be beneficial to encourage higher demand; and
- (4) Evaluate and invest in further value-add, revenue diversifying bio-production opportunities. This includes evaluating the feasibility of liberating and increasing feedstock supply (bagasse and tops and trash mainly) and making more electricity (co-generation) for export to the grid and further bio-fuel investments, including more ethanol from 1G and 2G ethanol technologies for sustainable aviation fuel (SAF), renewable diesel and marine fuel etc.

Our views on the Green Paper

Consistent with the sector's stated objectives to achieve higher utilisation of current ethanol production facilities and evaluate other bio-fuel investment opportunities, the ASMC shares the Australian Government's ambitions in the Green Paper to grow the domestic SAF industry. As stated in this submission, we also support the development of policies and Roadmaps to grow the Australian bio-fuels industry more generally – of which SAF should be one of various bio-fuels that are incentivized.

Defining a 'sustainable' liquid fuel and addressing certain threats

There are currently a number of global standards for sustainable fuels and materials made from bio materials – including the:

- Voluntary Roundtable on Sustainable Biomaterials (RSB) certification schemes; and
- Recently introduced regulatory requirements contained within the European Commission's ReFuelEU Aviation policy.

There are also multiple and voluntary sector-specific standards such as global aviation's CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) Sustainability Criteria for eligible fuels (which utilises the RSB).

The Queensland sugar industry will strive to continue to meet, and ideally exceed, the standards required of the market and/or governments to sell biofuels both domestically and in global markets. In this context, the milling sector continues to work to the RSB standard which it considers rigorous and market leading.

An issue that the ASMC is closely monitoring is the acceptance of sugar and related feedstocks (bagasse, molasses, tops and trash mainly) as a sustainable feedstock for bio-fuels given developments in the European Union (EU) where certain food and feed crop-based fuels are on 'negative lists' and not eligible under the ReFuelEU aviation initiative. For example, while not confirmed, it appears that molasses may be excluded from the list of accepted feedstocks for advanced biofuels². The following reflects the expressed European concerns:

- As final molasses is a widely utilised resource, increased allocation to bioenergy could result in displacement from other applications leading to market distortions. For example, if displaced from the animal feed market final molasses would need to be replaced by other energy feeds;
- The materials that are identified as likely to replace final molasses in existing applications (additional production of wheat, barley and sugar beet) are listed as medium-low land risk substitutes. The overall risk of additional demand for land is thus medium-high; and
- As a co-product of sugar production, final molasses is associated with several potential negative environmental impacts from land management. For example, both sugarcane and sugarbeet culture are identified in previous work for the Commission as requiring high fertiliser and pesticide inputs.

Although these concerns are not entirely shared in other jurisdictions, there is risk that Europe's views may be adopted elsewhere.

Molasses is currently the primary, and lowest cost feedstock for making 1G ethanol in the Australian sugar industry (and eventually Sustainable Aviation Fuel). If other jurisdictions were to follow the emerging European position, the Australian sugar industry's incentives to manufacture additional ethanol from molasses would be diminished.

In response, ASMC encourages Australian governments to:

- Incorporate into domestic policy design sustainability requirements based on leading, rigorous, workable and market accepted global sustainability certification schemes (such as RSB);
- Provide assistance to Australian industry to meet and exceed global sustainability certification schemes requirements; and
- In domestic and global fora, promote the acceptance of Australian biofuels that meet accepted sustainability standards and achieve key environmental objectives in favour of singular and distorting policy objectives like non-acceptance of food crops. In an Australian context with majority food exports and vast areas of arable and arid land that can be converted for crop production, this approach could result in higher environmental impacts overall (for example, higher consumption of non-food crops to produce bio-fuels could produce higher life-cycle bio-fuel greenhouse gas emissions

than if food crops were the feedstock).

Sugar industry biomass feedstock availability

From 32.4 million tonnes per annum (mtpa) of cane supply (i.e 2022 season supply), the Australian sugar industry currently generates the following quantities of biomass by-products (**Table 1**). These numbers would be higher if the industry was to reach full cane mill capacity which is 36 million tonnes of cane supply per annum.

The amount of feedstock that is potentially available to produce additional ethanol for bio-fuels for example is difficult to estimate as this would depend upon contractual obligations, market prices and the potential economic returns of investments to liberate more feedstock.

Table 1

By-product	Quantity generated per annum @32.4 mtpa cane supply	Comments
Bagasse	9 million tonnes	Bagasse is a critical energy feedstock to making steam and electricity which powers the mills. Some mills have excess bagasse and some mills have the ability to liberate more supply for additional investments in bio-fuel or co-generation investments i.e. through electrification and other improvements in mills that reduce energy consumption, bagasse consumption for steam generation in the mills can be significantly reduced. This will come at a cost to mills and would be recovered from the project that utilises the liberated bagasse. Bagasse could be utilised in 2G ethanol plants and in other bio-fuel technologies.
Tops and trash	6 million tonnes	Tops and trash are commonly left on the cane paddock as a green blanket to aid moisture retention and soil health. Further studies are required to ascertain the optimal green blanketing amount and the economics of harvesting surplus tops and trash for bio-fuel production. Tops and trash could be utilised in 2G ethanol plants and in other bio-fuel technologies.
Molasses	997,000 tonnes	Molasses is currently utilised by the sector to make 1G ethanol (for E10 and other industrial uses). Surplus molasses sold under short and long-term contract to a variety of end-users and supply will ultimately go to the highest value-use.
Dunder	150,000 tonnes	Supply will ultimately go to the highest value-use.
Mill mud	409,000 tonnes	Supply will ultimately go to the highest value-use.

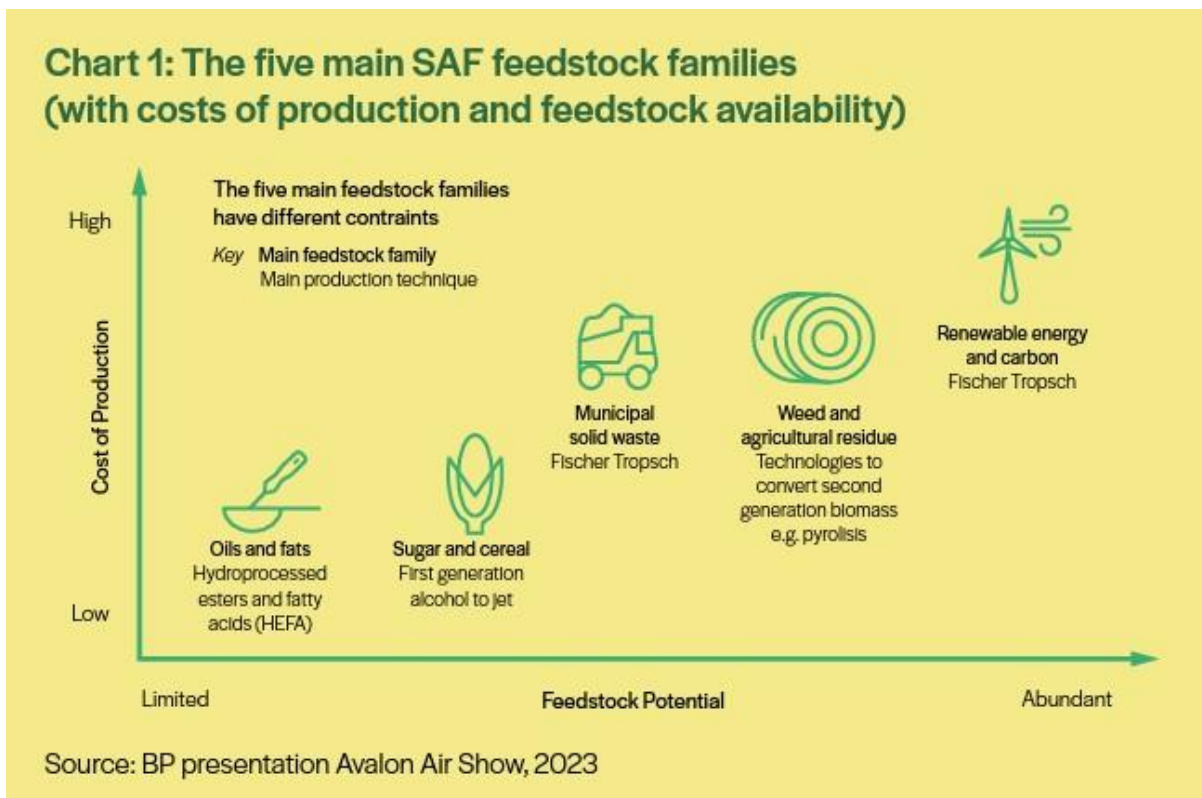
Source: ASMC member company feedback and QUT Biomethane method – agricultural waste

emissions report Final Report (V3)

All of these by-products can – hypothetically - be utilised as feedstock to produce bio-fuels with several technology pathways emerging, vis:

- Production of 1G and 2G ethanol, then the Alcohol-to-Jet (ATJ) pathway to make SAF and renewable diesel;
- Hydrothermal liquefaction (dissolution of lignocellulose using supercritical water to a biocrude product);
- Gasification of lignocellulose, then Fischer Tropsch pathway to SAF and renewable diesel; and
- Anaerobic digestion to produce biomethane.

Positively, **Chart 1** demonstrates that ATJ from 1G ethanol sits relatively low on the SAF cost-curve.



Evolving bio-fuel market opportunities are significant

Based on current known technology options and pathways, it seems likely that in the medium term and as part of a suite of actions, the aviation, marine and heavy-industry sectors will attempt to substitute avgas and diesel for bio-fuels to achieve de-carbonisation. This demand will be a complement to bio-fuel demand already enjoyed from E10 consumption and other industrial usages.

Current domestic climate policy settings may not incentivise bio-fuels

Presently, demand for substitute bio-fuels like SAF and renewable diesel stems from the voluntary commitments of corporations and industries (e.g. QANTAS' net-zero and SAF consumption goals and the global aviation's de-carbonisation goals). Regrettably there is currently insufficient 'sticks and carrots' in Australia's carbon and bio-fuel policy and regulatory settings to strengthen these voluntary commitments – for example:

- While the Safeguard Mechanism is designed to promote gradual reductions in emissions, we do not believe that the Mechanism will be effective because a carbon price in excess of \$300t/CO₂-e will be required to bridge the price gap between anticipated SAF prices and current jet fuel² (much higher than the \$75 carbon cap recently announced as part of the Mechanism).

Positively, airlines like QANTAS have committed funding to assist proponents develop feasibility studies.

The barriers to bio-fuels investment

The sugar milling sector is well placed to invest in bio-fuel supply capacity with access to feedstock, technology, capital and infrastructure and we share the Government's ambitions to grow a significant domestic bio-fuels industry. However, there are considerable supply and demand side uncertainties and constraints in bio-fuel markets that will require various forms of government interventions to address.

In the absence of a significant carbon price on fossil fuels, bio-fuels are unlikely to ever reach price-parity with conventional, higher greenhouse gas emitting fuels with estimates they will stay 2-5 times more expensive. As a result the rate of future demand for bio-fuels and therefore investment in supply in Queensland will be influenced by a complex set of factors including:

- Investment attractiveness influenced by the strength of Australia's comparative advantages to supply bio-fuels and relative bio-fuel costs;
- Competition from other industries (including energy) for biofuel feedstock (in the sugar milling process, bagasse and tops and trash could also be utilised to make more cogeneration steam and electricity);
- Risk of competitive distortions (e.g. airlines with different SAF ambitions will have different cost structures and may not be able to commit to SAF long-term);
- Perceived sovereign risks from policy changes and changes of government and effectiveness of existing government policies;
- Strength of incentives overseas and within other Australian jurisdictions that may result in bio-fuel feedstocks and investments 'leaking' to higher earning jurisdictions;
- Level of consumer aversion to higher costs and impact on levels of travel demand from mandated approaches;
- Strength of voluntary commitments of companies to purchase bio-fuels etc; and
- Ease of doing business in Queensland with regards to regulatory compliance and

² Bridging the Price Gap for Sustainable Aviation fuel report for Bioenergy Australia, EnergyLink Services, March 2022

planning approval processes.

Further barriers to bio-fuel investment and additional cane supply that are unique to the sugar industry

Additional complexities in the context of sugar milling are:

- The sovereign risks associated with pre-contract arbitration provisions contained in both Queensland and Federal law; and
- Reef regulations that restrict the horizontal expansion of land as well as nitrogen application.

The pre-contract arbitration provisions in the Federal Sugar Code of Conduct, and the *Sugar Industry Act* present risk to existing miller investment as well as potential future investments.

These provisions could lead to arbitration on a grower-miller cane payment matter results in an expropriation of financial returns from an investment made by a miller prior to the arbitrated outcome. This is considered a disincentive to investment given the lack of certainty on what future returns could be.

Furthermore, if not managed in a consultative and scientifically rational manner, Queensland's Reef Regulations may act to limit cane supply therefore undermining investment confidence in bio-fuel projects.

Aligning policy options to investment requirements

In the absence of long term offtake agreements between sugar millers/bio-fuel refiners/and bio-fuel customers and a high level of confidence in the commercial strength of entities that will refine and distribute the sector's ethanol into a bio-fuel, the above barriers and risks and uncertainties make it difficult for bio-fuel investments to proceed with a high level of confidence.

As a result, there will be a need for governments to intervene in bio-fuel markets to achieve the following investment requirements. Government interventions used successfully in other countries are also provided to inform discussion:

Requirement #1

Promote a consistent level of demand to incentivise supply

Potential policy responses include:

- Effective mandates (eg EU's recently introduced SAF Fit for 55 policy)
- Low Carbon Fuel Standards (LCFS) (such as in the U.S and Renavobio in Brazil)
- Renewable Fuel Standard (RFS) (such as in the U.S)
- Large foundation customers to assist volume growth (e.g. U.S military purchases).

Requirement #2

Incentivise supply at volumes that allow a commercial return on investment and that reduce costs of production over time

Potential policy responses include:

- Technology innovation and demonstration assistance measures

- Schemes like the LCFS and RFS create tradeable permits that increase the revenues to bio-fuel suppliers
- Low-cost loans (e.g. ARENA funding)
- Production grants
- Production tax concessions
- R&D assistance.

Requirement #3

Bridge the price gaps to reduce consumer aversion and competitive distortions in industries that consume the biofuels.

Potential policy responses include:

- Stimulate demand which will allow economies of scale on the supply side to be achieved
- Contracts for difference where government subsidises all or a percentage of the price gap
- Tax concessions (e.g. Federal government excise waved)
- Carbon credits like ACCU's.

End.