AUSTRALIAN SUGAR MANUFACTURERS

Submission to the Department of Infrastructure, Transport & Regional Development on the Cleaner Fuels Program (Policy Design and Engagement) – 8 January 2025

ABOUT THE AUSTRALIAN SUGAR MANUFACTURERS

The Australian Sugar Manufacturers (ASM) is the peak industry body representing the nation's sugar manufacturing sector, with the sugar industry contributing $4.4 billion annually to the Australian economy and supporting more than 20,000 jobs in regional communities. ASM works closely with its members, industry stakeholders, and government to develop and advocate for policies that enhance the sustainability, competitiveness, and long-term economic contribution of the sugar manufacturing sector. From the production of raw sugar, bio-based manufacturing and generation of renewable energy, the sector continues to support communities, create jobs, and foster a sustainable future for the industry, and the broader economy.

The ASM thanks the Department of Infrastructure, Transport for the opportunity to provide comment on the Cleaner Fuels Program. Please find our responses to the consultation questions below.

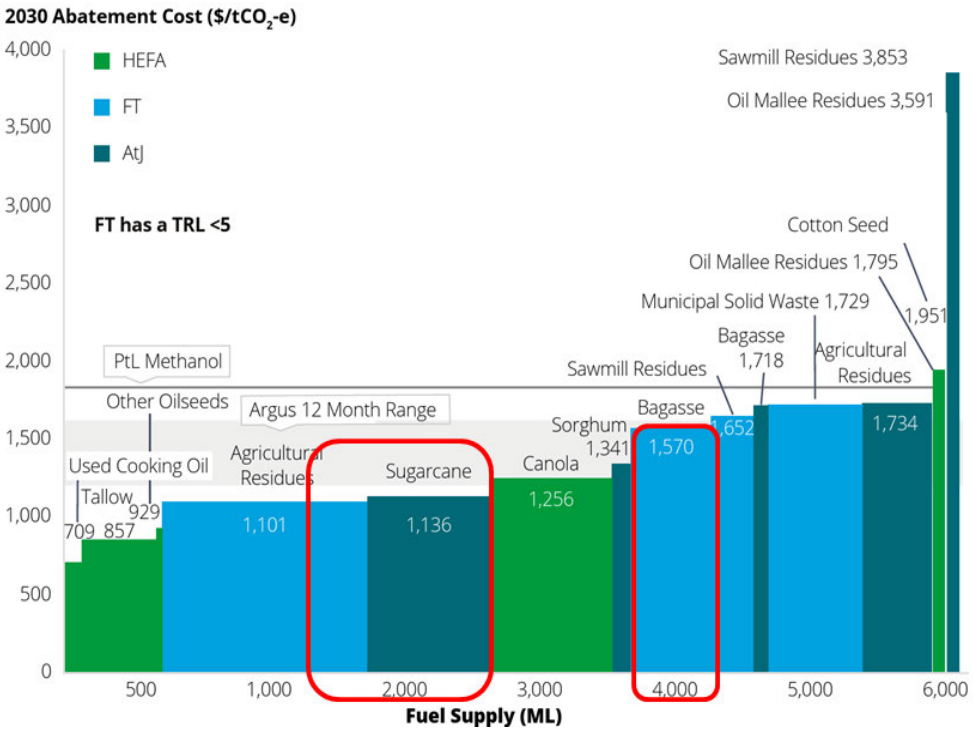
WAY FORWARD ON LOW CARBON LIQUID FUELS & THE SUGAR INDUSTRY

The opportunity

The sugar industry provides one of the cost-effective pathways for the production of low carbon liquid fuel (LCLF) at scale. The industry provides on average 30 million tonnes of sugarcane that could be potentially used for LCLF feedstocks. This includes the equivalent of 4million tonnes of raw sugar's worth of cane juice, 9 million tonnes of aggregated biomass (bagasse), similar amounts of disaggregated biomass (tops and trash on farms), over 1 million tonnes of molasses, and other processing byproducts and residues.

As per the Clean Energy Finance Corporation's (CEFC) 2025 analysis of opportunities within LCLF[1], Australia currently has enough feedstock to supply approximately 6,000 million litres of LCLF. Sugar in the form of sugarcane, bagasse and other agricultural residues forms a large portion of this potential supply as per the CEFC diagram below.

[1] Clean Energy Finance Corporation (2025), *Refined Ambitions – how Australia can become a low carbon liquid fuel powerhouse, at URL: https://www.cefc.com.au/document?file=/media/jh3gvm14/refined-ambitions-exploring-australia-s-low-carbon-liquid-fuel-potential.pdf*



Noting that the Australian domestic aviation industry alone uses 7,700 million litres of fuel annually[2], Australia needs to utilise and expand all the technology and feedstock pathways for LCLF to provide a viable net-zero pathway for hard to abate sectors and industries.

Benefits of sugar-derived LCLFs

Sugar-derived biofuels have significant benefits that could underpin an Australian LCLF market:

- It has a relatively low cost of carbon abatement compared to other domestic feedstocks (as per the chart above), whilst having the potential to provide LCLF at scale.
- Domestic sugar-derived biofuels will have a lower carbon intensity compared to the equivalent imported feedstocks.
- The technologies from sugar products underpinning alcohol-to-jet (ATJ) pathways are relatively mature, with LanzaJet having established a commercial alcohol to jet plant in North America in 2025.
- The sugar manufacturing sector is the key industry in terms of establishing a viable biomass to biofuels pathway, noting the availability of up to 9 million tonnes of aggregated biomass in the form of bagasse.
- The aggregation and processing of feedstocks and biofuels would take place near already established transport and economic infrastructure (airports, maritime ports and regional

[2] Queensland Government (2023), *Catalysing sustainable aviation fuel (SAF) in Australia,* at URL: https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0025/85480/SAF-sust-aviation-fuel-report-summary.pdf#:~:text=Annual%20Australian%20demand%20for%20jet%20fuel%20has,will%20increase%20with%20growth%20in%20global%20travel.

centres), lowering the potential cost for transport and logistics in aggregating feedstocks for processing, and in terms of taking LCLF to demand centres.

Barriers

The following act as a barrier to investment in LCLF supply through the sugar industry:

- *Significant capital costs & market uncertainty:* To capture the biofuels, biogas and bioenergy opportunities at scale will likely need billions in private investment, but many of these markets and supply chains are still developing with highly uncertain demand and costs, and face stiff competition by subsidised international competition. This uncertainty is a major driver in minimal private investment to date.
- *Government policy* – The viability of a proposed LCLF projects are contingent on government policy. A lack of clarity on demand side policies and incentives, makes it very difficult to make investment decisions on biofuels, with potential market prices and demand volumes unclear and uncertain without these policies.
- *The need to incentivise intermediary processing:* Incentives or support are required for intermediary processing, such as the production of ethanol, which forms the basis for the identified ATJ pathways for LCLFs. We currently have a total capacity of less than 450 million litres for the production of ethanol in Australia which is well short of the requirement to be able to achieve net zero targets. Intermediary processing is fundamental to LCLF and requires commitment as part of the LCLF pathways.
- *Investment in long-lived assets needs long-term commercial certainty*: To establish a biofuels capability at scale, the sugar industry will need to invest billions of dollars in infrastructure and equipment that will have a lifespan in excess of 20-30 years. To ensure a balanced risk-reward equation, long term commercial arrangements, including long-term offtake agreements, are required to secure the large-scale investments from the private sector. There are previous examples of schemes that have worked (such as the Renewable Energy Target (RET) scheme) which stimulated private investment into cogeneration and something similar is required to support for LCLF agenda.
- *Project readiness:* The uncertainty mentioned above means that there are few shovel-ready projects due to high cost of feasibility and final investment decision analysis (2 to 4% of total capital cost) mainly driven by the lack of any certainty on demand volumes and market revenue.
- *Infrastructure challenges:* Little work has been done around aggregating feedstocks for biofuels, biogas and bioenergy production, and the transport and logistics infrastructure needed to support this aggregation. The sugar manufacturing sector has an advantage in this space with well established logistics systems that could be leveraged to support the LCLF pathways.

Way forward

Without addressing these barriers, Australia risks missing the opportunity to build a truly sovereign LCLF supply chain. At a high level, the ASM provides the following recommendations for the Program:

- Support the establishment of long-term offtake agreements that would provide the certainty to commit to long-term investment in LCLF supply and supply chains.
- The Program should include a broad range of LCLFs, including 1G and 2G ethanol, biomass to biofuels technology pathways, sustainable aviation fuel, biodiesel, maritime diesel, biocrude and methanol.
- The Program should provide the financial support to the feedstocks and technology pathways that will ensure investment in supply at the scale that will match the demand that the Government's demand side policies will create – making the finalisation of demand-side measures an absolute priority.
- The criteria for funding supports and supply-side incentives should consider the cost of carbon abatement in the medium to long-term, scalability of production, the ability to establish a sovereign capability and community/economic benefits.
- The need to support intermediary processing capacity, such as ethanol production, to ensure that processed feedstocks are available at the scale required to meet the LCLF demand within the market. For ethanol, this could be achieved through ensuring effective ethanol mandates are in place and enforced.

While the $1.1 billion investment in the Cleaner Fuels Program is a great first step in standing up LCLF capability, the quantum of money being put forward, in isolation, is unlikely to be enough to meet the states ambition of the Program – providing a credible net-zero pathway for all identified hard to abate sectors through LCLF. The quantum of funding should be juxtaposed with the $7.2 billion allocated for the Cheaper Homes Batteries Program, providing a reference point as to the resources required to create a step change in production within a national energy market.

The ASM understands that this Program will be part of a broader set of policies and incentives to stand up a LCLF market.

To assist the Department with its deliberation on establishing supply side frameworks and incentives, the ASM has endeavoured to provide further feedback to consultation questions where possible. The answers provided should be viewed as directional, noting the difficulty of providing concrete feedback in the absence of an understanding of what demand-side policies and incentives might be, and the volumes expected to be required to meet this induced demand.

AUSTRALIAN SUGAR MANUFACTURERS

LOW CARBON LIQUID FUELS ELIGIBILITY

Question: Should certain types of LCLF be prioritised over others?
Should LCLF suitable for particular sectors or uses be prioritised? For example, should sustainable aviation fuel be prioritised over renewable diesel?
Should LCLF for certain sectors or uses be de-prioritised due to other viable decarbonisation pathways?
What market impacts are anticipated by influencing prioritisation of particular fuel types?

The Government's stated priority is to ensure emissions reduction in hard to electrify sectors, with aviation, construction, mining, maritime transport and agriculture specifically called out. The ASM believes that the Program should allow support for a broad range of LCLF, including 1G and 2G ethanol, sustainable aviation fuel, biodiesel, maritime diesel, biocrude and methanol. These will all go towards addressing the potential demand from the Government's stated priority sectors. Overly prescriptive criteria that rules in or out LCLFs will likely have unintended consequences, increase the cost of LCLFs, and create barriers to the establishment of LCLF markets at scale.

There is a narrative that policies should be focused exclusively on the fuel use of hard to abate sectors, with a focus on the production of sustainable aviation fuel and biodiesel. However, the scalability of both fuel types is reliant on the utilisation of alcohol-to-jet (ATJ) fuel processing, where bioethanol is the feedstock, gasification pathways for biomass using bio-methanol, and the production of biocrude through hydrothermal liquefaction. Through all of these technologies the production of intermediary products is important and these need to be considered as part of LCLF program.

With respect to bioethanol, Australia has less than 450 million litres of bioethanol capacity and requires significant investment to increase this capacity to feed into other biofuel supply chains. Without government investment and incentives, the required investment to increase ethanol production capacity will not occur. It should be noted that Australia's bioethanol capacity has shrunk over the past five years, with the Dalby Bio-Refinery closing in 2020 due to significant financial losses, removing 80 million litres of bioethanol production from the market.

Similarly, the Program must give equal footing for pathways that can utilise biomass for LCLF, including processes that underpin the production of methanol and biocrude that can be converted into a multitude of LCLFs. Biomass, particularly from waste and residue sources, have the lowest carbon intensities attached to the feedstock, and are the most abundant category of feedstock available. The scalability of the LCLF industry will require the utilisation of biomass to biofuels pathways.

Imported bioethanol would likely not be suitable to fill this void, and would have a much higher carbon intensity, given the significant distances it would need to be transported, the emissions intensity of non-sugar derived ethanol (e.g. from maze), and the Australian sugar industries

superior sustainability performance compared to other sugar and biofuels producing nations. It would also not be consistent with the community benefit principles that underpin the Future Made in Australia agenda.

TYPES OF PRODUCTION SUPPORT

Question: Should the production credit be a fixed amount per litre of production, or a variable amount that depends on the market price of LCLF?

Are there any potential benefits, risks or constraints considering the two different production credit options? What type of mechanism provides the greatest investment certainty or level of bankability to projects?

The mode of government funding that would provide investment certainty is some level of grant funding, long term off-take agreements or productions credits, and clear commitments to demand side measures. Demand-side factors underpinning the LCLF market are highly uncertain and contingent on very uncertain government policies domestically and abroad.

As such, certainty in demand side policies is a necessary condition to stimulate investment. This will potentially require a demand side mandate or a scheme equivalent to the Renewable Energy Target for LCLFs. It should be noted that the Renewable Energy Target (RET) spurred $500 million in investments by sugar manufacturers in capacity to cogenerate renewable electricity.

If a production credit is required, a fixed price credit that locks in price certainty would provide most certainty. Supply incentives should support and promote long-term offtake agreements with producers at the point of final investment decision and could be aligned to the commercial realities of the various production, feedstock and technology pathways.

How do you consider pricing for LCLF will be set over the short-medium term and longer term? Will pricing be matched to a premium on equivalent fossil fuel or price of imported LCLF or be on a carbon abatement basis?

The Federal Government's core liquid fuel policy priorities have been focussed on carbon abatement and developing sovereign capabilities. In addition, the FMA agenda puts forward community benefit priorities for the Program. As such, pricing should be guided by carbon abatement, domestic production, including the use of domestic feedstocks in the production of biofuels, and the maximisation of community benefit.

Market prices will be set like any other market through supply and demand and thus will be heavily reliant on the Federal Government demand side policies for biofuels. A demand side incentive akin to the Renewable Energy Target (RET) for biofuels may provide an effective mechanism to stimulate demand cost effectively.

Any demand side incentive or mandate must ensure compliance through penalties and enforcement action. Ineffective mandate regimes for biofuels, such as those for drop-in ethanol, means that governments must redouble their resolve to demand-side measures to win back trust from potential producers.

Question: To deliver the policy intent of the Program while maximising the value for taxpayers, do you agree that projects with the lowest cost should be prioritised under the Program, with the cost being measured either as per unit of LCLF produced or as per unit of carbon emissions abated?

The primary criteria should be the ability to scale LCLF production in the medium to long-term, and the ability to provide the largest amount of carbon abatement cost effectively.

All LCLF are high-cost relative to fossil fuels. A misguided focus on lowest cost at the inception of the project will lock the market into technologies that will have very limited production capacity. As an example, biofuels derived from tallow and used cooking oils are likely one of the lower cost LCLFs in the market today. However, prioritising this pathway would provide Australia with a very limited biofuels production capability noting the limited availability of the feedstock, nowhere near enough to address the carbon abatement challenges faced by air and maritime transport.

Noting that this Program is a core component of the Federal Government's *Future Made In Australia (FMA)* agenda, priority of funding should also consider the community benefits principles put forward by the FMA agenda including securing domestic supply chains and skills, and promoting diverse workforces and secure jobs in regional Australia.

There are also interdependencies between the cost of various technologies and biofuels feedstock. A narrow focus on what is low cost now, will not guarantee low cost into the future. If we cannot leverage a diversity of feedstocks and technologies, the incumbent technologies and producers will need to pay higher prices for the limited supply of feedstock available, eroding their cost competitiveness.

Question: Should the production credit be linked to the quantum of LCLF produced, or the carbon emissions saving potential of the fuel?

The primary imperative is carbon abatement, as such carbon emissions savings should be at the heart of any scheme, with incentive linked to the quantity of LCLF provided to the market. Further consideration should be given to developing sovereign LCLF capabilities, where local production and local feedstock use are incentivised, and in meeting the Federal Government community benefits principles.

Question: What are your views on the cost to deploy LCLF domestically compared to internationally? Is there a local premium for domestic production?

We can overcome the high cost of doing business in Australia, if carbon intensity fundamentally underpins financial incentives within the market, with the cost and carbon intensity of importing biofuels negating their potential lower cost of production.

The ASM would note that the issue is not just the cost to deploy LCLF, but the level of government commitment and support. The production of LCLFs are costly compared to fossil fuels in all markets where there is production capacity. The differentiator between countries that produce LCLFs and those that don't is long-term government investment and commitment to supply and demand side incentives.

Question: Should the total value of production credits be capped for each project? If yes, what should the capped amount be and why?

There does not seem to be a strong rationale to impose caps on credits provided to producers, if credits are based on actual production of LCLF

Question: Should production be focused on domestic supply only or should export also be permitted? What impact could restriction have for projects or the market?

The ASM understands the need to ensure that the Program induces the supply of LCLF to provide affordable and reliable LCLF to hard to abate sectors. Equally, locking the supply of LCLF domestically will distort the market and create significant risk in an already risky nascent market, where the lack of competitive tension may mean that the benefits and surplus from this market disproportionately goes to consumers, severely curtailing any future investment in supply and putting the viability of producers into question.

A middle ground approach may be to reduce the quantum of credits provided for LCLF if and when it is exported, or ensuring that domestic market demand is first satisfied before allowing for exports. It should be noted that a stated outcome from the *Future Made in Australia* agenda is to 'crowd-in' investment in 'value-added export industries' – to limit the export potential of LCLFs would go against this policy priority.

Question: Is there a role for combined production support with capital grants for first-of-a-kind facilities?

Capital grants would assist in reducing the first-of-a-kind risks (technology risk, market development risk and delays, supply chain risks etc.) to project proponents, and the ASM fully endorses this proposition (see response to question 2.1). The ASM also cautions that the policy should take a principled approach to what 'first-of-a-kind facility' actually means and not to repeat needlessly restrictive approaches to grant funding, that focus on 'innovative' technologies.

A fundamental challenge to any LCLF production capability will be establishing the physical supply chains, intermediary processing, and commercial arrangements up and down the value chain. Ensuring the transport and logistics infrastructure is available, and that commercial arrangements maintain and expand the availability feedstock, service providers and processing is a 'first-of-a-kind' challenge.

These challenges have largely been ignored by government, and failure to address it will translate into a very limited LCLF capability in Australia.

Question: What other types of funding or concessional finance could support LCLF projects (e.g. funding from CEFC and NRF)?

Concessional loans and access to finance will be an important consideration. As an example, some sugar manufacturers have a cooperative organisational structure, making it more difficult to secure large-scale finance even if a proposed project is viable. As such, there is a role for government on this issue.

Question: Is any other support required across the supply chain to enable domestic production of LCLF?

In addition to supply-side measures, long-term commitment to policy and regulatory measures that will underpin demand for biofuels at a price that will provide returns for producers is required, noting the 20–30-year investment horizons for establishing biofuels capabilities.

With respect to supply-side measures, there are significant challenges to develop the physical supply chains and the commercial arrangements and incentives to stand up a LCLF production capacity. On the most, this challenge has been ignored by policymakers, and it will be the key determinant as to whether this agenda will be successful.

The ASM has developed a comprehensive package of recommendations to ensure the required supply and value chains are developed for LCLF. Support is required for transport and logistics infrastructure, intermediary processing, and R&D. The ASM's submission to the National Bioenergy Feedstock Strategy (***attached***) provides a comprehensive overview of required supports, with a summary of recommendation at page 25.

Question: What lessons can Australia learn from other jurisdictions that have already implemented LCLF production support measures?

As previously mentioned, the differentiator between countries that produce LCLFs and those that don't is long-term government investment and commitment. Countries like Brazil, the USA and India have significantly increased their biofuels production capability through consistent and long-term government incentives and support.

Without long-term commitment, the risks for industry are simply too great. This is exemplified by the shockwaves created amongst UK biofuels producers, when a US-UK trade deal abolished the 19% UK tariffs on US ethanol. The two major producers, Vivergo and Ensus, who account for nearly all of the UK's biofuels production, have suggested that the removal of the tariff has made operating in the British market 'impossible'.

A detailed overview of this issue has been provided in ASM's submission to the National Bioenergy Feedstock Strategy at pages 20-24.

FUEL PRODUCTION

Question: Considering this objective, what production pathways should be focused on or prioritised?
Should priority be given to projects that use more-established production pathways (e.g. HEFA and HVO) than nascent production pathways that may present a higher level of technology risk?

How can nascent production pathways compete with more-established production pathways (e.g. HEFA and HVO)?

As previously mentioned, the objective of the scheme should be to promote long-term scalability of LCLF production, which will necessitate support for a variety of technologies and feedstocks, including ATJ and biomass to liquid fuels. A supply curve analysis that provides the volume of LCLF from different feedstocks can be arranged based on the cost of abatement and will provide clarity as to what the Program might need to do to ensure the viability of investments in LCLF supply.

A narrow focus on technologies that are more established in Australia, like HEFA:

- does very little in progressing other technology pathways, including biomass to biofuels;
- would have limited scalability, noting the limited availability of used cooking oil and tallow;
- would lose its cost advantage if other feedstocks, such as canola, were utilised (canola HEFA has a much higher cost of abatement than used cooking oil and tallow); and
- would increase the cost of the technology, through higher prices for limited feedstocks for that technology.

It should be noted that ATJ pathways for the production of sustainable aviation fuels, producing bioethanol from sugar or molasses, is a mature and lower risk technology pathway overseas. The ATJ pathway recently achieved an important milestone with the world's first commercial-scale production at LanzaJet's Freedom Pines Fuels facility in Georgia, USA.

If there is a goal for immediate carbon emissions reduction from liquid fuels at the lowest cost, then governments should include increasing the efficacy of ethanol mandates for blended fuels, which can provide significantly more carbon abatement and at a much lower cost, and provide a growing and long-term supply of ethanol that can be used for biofuels via ATJ.

What minimum stage of project development (and evidence) should be expected by projects under the Program?

A one size fits all approach will not be sufficient in terms of project development support. Noting the cost to get to a final investment decisions (FID) for a proposed project can be up to 4% of the project's cost, the Program should consider funding support for feasibility studies for biofuels proponents, with an emphasis on later stage feasibility assessments.

This support could be provided in a similar manner to ARENA funding but should go beyond a narrow focus on the refining technology or refining operations and look to support the supply chain investments required to support biofuels production, including feedstock development / collection and intermediary processing.

Commitment to funding or the provision of production credits should be provided to proponents at the FID stage, where finances and long-term agreements have been put in place. The finalisation of government commitments will provide the certainty needed to progress with the project.

Should Indirect Land Use Change (ILUC) be included in the method for determining carbon intensity, for the purpose of the Program?

We believe that ILUC should not be used to determine carbon intensity. Australia's sugar industry exports about 80% of its raw sugar to global markets. Australian sugar producers could switch from sugar production to ethanol production to support domestic production of SAF, for example. While this would represent a shift from a food product to a fuel product, it would underpin sovereign supply of a renewable fuel without impacting domestic sugar supply.

Should any feedstocks be prioritised or otherwise considered out of scope?

No. However, the ASM would suggest that prospective feedstocks that are not being commercially produced have their carbon intensity validated when commercial production is underway.

Theoretical life cycle analysis for prospective feedstocks based on small pilot projects and trials will be insufficient, noting that commercial production will be subject to factors like crop damage from pest and disease, natural disasters, supply chain breakdowns, lower yields and other challenges that will increase the per tonne carbon intensity of the feedstock.

The ASM further understands that the Federal Government is undertaking food and fuel security strategies side by side, and as such, suggests that feedstock prioritisation co-optimise these two security priorities.

Question: Other than carbon intensity, should any other sustainability criteria be included?

The Program should consider the community benefits principles put forward by the FMA agenda including securing domestic supply chains and skills and promoting diverse workforces and secure jobs in regional Australia.

Promoting a truly domestic supply chain for the LCLF should be a criterion. This includes demonstrating the use of domestic feedstocks for LCLF production.

The establishment of an ATJ or biomass/bagasse to LCLF capability in the sugar industry would ensure the asset renewal and longer-term sustainability of the industry (which is under pressure) for the benefit of regional Queensland and securing regional manufacturing.

Question: Which international and domestic sustainability schemes should be allowed to verify sustainability claims?

There are a range of credible domestic and international schemes that should be allowed under the Program. For current bioethanol production in Queensland, producers adhere to stipulations under the *Liquid Fuel Supply Regulation 2016*. Members involved in the production of bioethanol have noted that they rely on the Roundtable on Sustainable Biomaterials (RSB) Association certification, which is consistent with the Queensland regulations.

Ensuring that sustainability requirements capture current practices and certification will be vital in terms of not creating needless costs through red tape.

Question: Recipients under the Program will need to deliver benefits according to the Community Benefit Principles under the Future Made in Australia Act (see Appendix D). How do you consider the Community Benefit Principles in relation to LCLF projects? Are there specific Community Benefit Principles that are more or less relevant?

The Program should also consider the community benefits principles put forward by the FMA agenda including securing domestic supply chains and skills and promoting diverse workforces and secure jobs in regional Australia.

Similarly, maintaining and developing domestic capabilities across the entire LCLF supply chain must be a priority within the Program. A key issue for Australia is its reliance on imported liquid fuels, and if a LCLF industry underpinned by the Federal Government simply replaces the dependence for imported liquid fuels for imported ethanol, this is a bad outcome for the Australian economy.

Question: How will overseas policy developments interact with domestic policy settings to support projects reaching final investment decisions? For example, LCLF demand-side targets or mandates, and international frameworks such as the International Civil Aviation Organisation long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050.

The Program must be very careful on placing a significant emphasis on global policy development to underpin the viability of a domestic LCLF project. By placing too much weight on overseas developments, the government is simply placing undue risk on LCLF project proponents.

As an example, The International Maritime Organization's net zero framework was delayed due to opposition from key countries and concerns about the framework's emission reduction targets. As such, implementation of binding emissions targets and a global carbon pricing system for the shipping industry has been indefinitely postponed, creating uncertainty around the maritime industry's medium-term need for LCLF.

As such, long-term aspirational goals from fuel consumers, such as those promoted by the International Civil Aviation Organisation, cannot be relied upon in making commercial decisions, noting ample evidence of the difficulties of converting aspiration into action.

Question: In addition to production support, what other measures are considered critical to achieve final investment decisions for projects? What are their key features?

An important measure is the establishment of a long term and stable regulatory framework that establishes a market demand and sustainable price for LCLFs. The Program should support those seeking offtakes entering into longer term contracts to underpin the significant investment required to develop LCLF capacity.

With respect to supply chain development, the Federal Government must make grant funding available for the capital and infrastructure required to stand up a LCLF supply chain. As an example, the ATJ pathway for LCLF will require significant quantities of ethanol.

The sugar industry provides one of only two ethanol facilities in Australia, and the underlying commercials for the maintenance and expansion of the facility is not attractive under current market conditions. Yet, government policy seems to be myopically focussed on subsidising biorefining technologies and developments, a necessary but insufficient approach to establishing a biofuels capability.

Similarly, very little thought has been given to the transport and logistics infrastructure required to underpin a LCLF supply chain. As an example, biomass to LCLF pathways will be underpinned by biomass from the sugar industry (bagasse and potentially tops and trash). This in turn is reliant on the 4,000km of cane rail infrastructure the sugar industry operates and maintains, which could also be utilised in the off-season to aggregate other agricultural and forestry biomass for the production of LCLF.

The cost of this infrastructure exceeds $2.5 billion and becoming exceedingly difficult for the sugar industry to maintain. Yet there is no federal or state government support for the maintenance or expansion of a transport network that will be central to a LCLF industry.

Question: What are the intersecting policies you expect need to be considered to unlock a domestic LCLF production industry?

Industry specific regulations will act as a barrier to unlock the domestic LCLF production industry. As an example, the sugar industry is governed by the Sugar Industry Code of Conduct federally and the Queensland Sugar Industry Act, that provides for pre-contract arbitration.

In effect under the Code and the Act, if negotiations are initiated within the sugar industry, including those exploring what commercial arrangements may look like to participate in a biofuels supply chain, either party to the negotiations can take the matter to pre-contract arbitration if those negotiations are not finalised, and a commercial outcome can be imposed.

This creates a significant barrier to establishing new commercial arrangements that can facilitate new opportunities, including those in biofuels production.

To discuss this submission further, please contact Mr Ash Salardini, Chief Executive Officer [redacted]

Yours sincerely

Ash Salardini
Chief Executive Officer

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Submission to the Department of Agriculture, Fisheries and Forestry's National Bioenergy Feedstock Strategy

Australian Sugar Manufacturers

6 November 2025

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Executive summary

About the Australian Sugar Manufacturers

The Australian Sugar Manufacturers (ASM) is the peak industry body representing the nation's sugar manufacturing sector, with the sugar industry contributing $4.4 billion annually to the Australian economy and supporting more than 20,000 jobs in regional communities. ASM works closely with its members, industry stakeholders, and government to develop and advocate for policies that enhance the sustainability, competitiveness, and long-term economic contribution of the sugar manufacturing sector. From the production of raw sugar, bio-based manufacturing and generation of renewable energy, the sector continues to support communities, create jobs, and foster a sustainable future for the industry, and the broader economy.

Importance of sugar industry in building a sovereign biofuels and bioenergy capability

In addition to food production, the sugar industry is one of the few regionally located manufacturing capabilities that can deliver a broad set of products at a commercial scale. From our 30 million tonnes of cane, we produce approximately 9 million tonnes of bagasse (fibrous byproduct from sugar production), similar amounts of tops and trash at the farm level, significant quantities of molasses, and cane juice that currently produces approximately four million tonnes of sugar. These feedstocks provide limitless opportunities, including:

- The production of low carbon liquid fuels, including for the Australian Defence Force (ADF), with the potential to provide more than 30% of the domestic aviation fuel demand[1] (not including the utilisation of tops and trash).
- Baseload renewable electricity generation (835MW of potential capacity[2]) through cogeneration – enough power for nearly 500,000[3] Queensland homes.
- Providing for other low carbon energy solutions including biogas.
- The pelletisation of bagasse, which can act as an input to multiple forms of energy production, could be a no-regret pathway for industry and government noting its potential use for the production a myriad of fuels and energy generation processes.
- A catalyst for the establishment of bioenergy precincts where sugar production provides the baseload capacity and the transport and logistics infrastructure, to enable the scaling of energy production through the use of other feedstocks (such as hardwood residues and agricultural waste).

[1] CSIRO (2023), Sustainable Aviation Fuel Roadmap, at URL: https://www.csiro.au/-/media/Energy/Sustainable-Aviation-Fuel/Sustainable-Aviation-Fuel-Roadmap.pdf

[2] ASM (2025), Bioenergy Fund Project – Electricity Cogeneration in the Sugar Industry, yet to be published.

[3] A typical Queensland home uses between 5000-5500 KWh of electricity per annum (see AEMO at URL: https://www.aemc.gov.au/sites/default/files/2021-11/se_qld_fact_pack.pdf) . According to the ASM (2025) Bioenergy Fund Project, the sugar manufacturing sector has the potential to create 2.6TWh of electricity per annum in total. This quantum of electricity is equivalent to approximately powering 500,000 Queensland homes annually.

- Has significant opportunities in biomanufacturing in the longer term, including bioplastics and alternative proteins.

Barriers to the implementation of a diversification agenda

Key barriers include:

- *Significant capital costs & market uncertainty:* To capture the biofuels, biogas and bioenergy opportunities at scale will likely need billions in private investment, but many of these markets and supply chains are still developing and maturing face stiff competition by subsidised international competition and are dependent on government policy. Without government co-investment, particularly during the market forming phase, the risks are simply too high for such large-scale investments.
- *Project readiness:* This same uncertainty means that there are few shovel-ready projects due to high cost of feasibility and final investment decision analysis (2 to 4% of total capital cost) and the lack of any foreseeable market revenue. This may create a perverse situation where Australian demand side incentives create a subsidy for imported biofuels feedstock, such as Brazilian and Indian bioethanol, creating little economic value for Australia.
- *Infrastructure challenges:* Little work has been done around aggregating feedstocks for biofuels, biogas and bioenergy production, and the transport and logistics infrastructure needed to support this aggregation.
- *Energy market distortions:* The baseload synchronous nature of cogeneration is undervalued and not rewarded by the National Energy Market, stifling investment in utilisation and expansion of cogeneration.
- *An R&D agenda that is not fit for purpose*: The sugar industry requires government co-funding to ensure the industry R&D agenda can undertake the suite of work. The current sugar industry R&D agenda is not properly resourced or skilled to maintain programs for traditional sugar production as well as address the R&D opportunities and challenges that a biofuels and bioenergy supply chain creates.

Without addressing these barriers, Australia risks missing the opportunity to build a sovereign bioeconomy. That is why the ASM is putting forward the following recommendations.

The role of government

Countries like India and Brazil heavily subsidise their sugar industries, treating them as sovereign capabilities for food and liquid fuel security. Conversely, the US and EU governments erect significant barriers to their sugar markets, while providing market protections and subsidies for biofuels. This leaves the Australian sugar industry highly exposed.

This threatens a regional industrial capability with a replacement value in excess of $20 billion and supports regional jobs and Queensland economies. If Australia had to reinvest in the transport, logistics and processing capabilities the sugar industry provides for the production of low carbon liquid fuels, sugar-based biofuels and bioenergy feedstocks would not be viable. The

Australian Government cannot let a regional industrial capability worth over $20 billion go to waste. A free market approach to the development of Australian biofuels and bioenergy industries will not succeed, noting:

- that traditional incumbent fossil fuels are more cost competitive, requiring government intervention to create demand for biofuels; and
- our inability to compete with highly subsidised global producers, noting the significant investments by overseas governments into developing sovereign capabilities biofuels and bioenergy (see section - *Government policies – international and other industry experience*).

Government commitment is required. If there is long-term government commitment to the development of biofuels and bioenergy markets in Austral, the sugar industry sees biofuels, biogas and bioenergy as a clear path to long-term viability. A successful diversification agenda will likely see the adoption of multiple new opportunities, whether in biofuels, biogas or bioenergy, across different sugar regions based on regional infrastructure availability, proximity to market, proximity to other supply chain partners, and other local considerations. This will not be a one-size-fits-all solution.

AUSTRALIAN SUGAR MANUFACTURERS

Summary of recommendations

1. To ensure that there is a shovel ready pipeline of sugar biofuels and bioenergy projects, the ASM seeks **government funding towards feasibility and final investment decision studies**. (**$9 million** in total funding by the Federal Government).
2. **Capital grant funding for innovation, energy efficiency & transition ($90m):** A grant program for capital projects should be established to encourage technology adoption within sugar manufacturing, promote energy transition imperatives through facilitating energy efficiency and feedstock liberation, and energy production programs.
3. **Funding for a pre-feasibility for a sugar biofuel supply chain with the Australian Defence Force ($1 million),** noting the colocation of potential production and demand.
4. Government-industry co-investment towards a **$24 million R&D capability for advanced sugar manufacturing** (**$12 million** funding from Federal Government).
5. Noting the centrality of the cane rail network for the aggregation of biofuels and bioenergy feedstock, the ASM recommends that:
    - The inclusion of **cane rail in national disaster recovery support** (**$9 million**).
    - Establishment of a **$60 million Cane Rail Fund** to provide co-funding for cane rail upgrades, particularly for bridges and level crossings.
6. To create demand for biofuels, the ASM recommends the establishment of **a national biofuels mandate** with requirements for a portion of the mandate to be filled with local feedstocks and a strong weighting in preference of low carbon intensity.
7. **Incentives for increasing cane supply ($10 million):** Cane supply will be a key determinant for a scalable biofuels future. The ASM proposes several initiatives, including:
    - Incentives to convert land back to cane land.
    - Initiatives to secure the future of the harvesting sector.
8. Assist with **access to finance** for sugar manufacturers with a cooperative organisational structure (cooperatives have difficulty in securing access to finance).
9. Noting the significant benefits of cogeneration, explore opportunities for **offtake agreements with sugar manufacturers,** for both existing and new facilities with either fixed or floor pricing**,** in recognition of the benefits of the baseload nature of the generation.
10. This could be delivered as a part of an holistic **sugar industry diversification strategy**, similar to the National and Queensland timber industry strategies.

Total cost of package: Approximately $182 million

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The challenge: Biofuels and bioenergy markets are reliant on government policy and investment domestically and globally

The sugar supply chain provides the most viable pathway for the creation of biofuels, biogas and bioenergy at scale, particularly from Queensland. However, the long-term viability of some sugar manufacturing facilities is uncertain. Much like other trade exposed heavy industries, the cost of doing business in Australia has grown exponentially, while heavy subsidies and government support for our main global competitors, particularly in India and Brazil, remains unchecked as adherence to global trade rules is breaking down. Countries like India and Brazil do not see the sugar industry as a private commercial endeavor but a central sovereign capability that will secure their food and fuel security.

Global experience demonstrates the need for long-term government commitment to establishing a domestic capability in low-carbon-liquid fuels and bioenergy. Australian governments need to acknowledge that countries around the world are investing and protecting their sugar industry as a sovereign capability for food and fuel. The Australian approach to the sugar industry is grounded in a hands-off free market approach, despite no free market existing for sugar.

If the government approach to the sugar industry is replicated for the establishment of biofuels and bioenergy industries, it is highly unlikely that a sovereign capability will be developed at the needed scale.

The way forward – The sugar industry as the solution for bioenergy

The ASM submission provides an overview of each of these opportunities if adopted at scale across all sugar regions to provide a 'size of the prize' overview of the opportunity. A successful diversification agenda will more likely see the adoption of multiple new opportunities across different sugar regions based on regional infrastructure availability, proximity to market, proximity to other supply chain partners, and other local considerations.

Some sugar regions may choose to focus on biofuels and biogas opportunities, while others may explore pelletisation of bagasse or further utilisation of cogeneration, and a select few may have opportunities across all diversification opportunities including biomanufacturing. The regional realities will dictate the pathway for diversification.

AUSTRALIAN SUGAR MANUFACTURERS

Establishment of bio-precincts around sugar manufacturing facilities

The opportunity

Above and beyond the feedstocks available and at hand for sugar manufacturers, our sector has the capability to establish bio-precincts in and around our facilities for the production of biofuels and bioenergy at scale. We could potentially leverage nearly 4000km of cane rail network, that is used to transport cane for five to six months of the year, to collect and aggregate other feedstocks, including tops and trash from cane growers, forestry residues, and other agricultural byproducts for bio-production.

This would provide Australia with the opportunity to exponentially scale biofuels, biogas and bioenergy production, by utilising existing transport infrastructure and increasing the capacity of bio-processing facilities. As an example, cane rail networks could be used to aggregate hardwood plantation residue in Queensland in and around sugar manufacturing facilities. These residues could then be used in conjunction with sugar byproducts like bagasse, dunder and mill mud for the creation of biogas. This additional feedstock could justify investment in larger bio-processing capacity, reducing unit cost and improving viability.

This is a significant advantage of sugar-derived biofuels and bioenergy pathways over HEFA based fuels, where the availability and flexibility of feedstock can ensure long-term scale and viability (as compared to the finite availability of tallow and used cooking oils). The potential utilisation of oilseeds, such as canola, by HEFA projects to circumvent availability issues creates a cost problem, noting that the abatement cost of canola-based biofuels are higher than that of used cooking oil, tallow and sugar-derived biofuels. [4]

Many proposed HEFA plants, including Shell's proposed Rotterdam plant[5], have been abandoned due to limitations surrounding the availability of affordable feedstock.

Bio-precincts in and around sugar manufacturing facilities would further create a source of revenue for a myriad of industry stakeholders, including cane growers for their tops and trash, and the forestry industry for their residues.

Challenges

The cost of maintaining cane rail infrastructure, with a replacement exceeding $2.5 billion[6], is becoming a large impost on sugar manufacturers. This has been compounded by the increasing incidence of natural disasters and adverse weather events due to the changing climate.

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[4] CEFC & Deloitte (2025), Refined Ambitions: Exploring Australia's Low Carbon Liquid fuel Potential, at URL: https://www.cefc.com.au/document?file=/media/jh3gvm14/refined-ambitions-exploring-australia-s-low-carbon-liquid-fuel-potential.pdf

[5] Argus (2025), Shell abandons Rotterdam biofuels plant plan: update, 3 September, at URL: https://www.argusmedia.com/en/news-and-insights/latest-market-news/2727719-shell-abandons-rotterdam-biofuels-plant-plan-update

[6] In 2015, the Department of Infrastructure and Regional Development provided analyses that the replacement value of cane rail infrastructure was between $300,000 to $500,000 per km, equating to a replacement value of up to $2 billion for the entire network. We have conservatively added a CAGR of 2.5% to this cost, making

Despite the significant public benefits of the cane rail network, including currently keeping Queensland's second largest freight task off regional roads, the complete cost of maintaining this network has been left to sugar manufacturers, with no federal or state government investment. The maintenance impost is becoming too great, and this has meant sugar manufacturers are actively considering reducing the footprint of this network and move more of this freight task onto roads.

This is a bad outcome for congestion and maintenance of regional roads, including the financial impost on local and state governments, but also will begin to limit the opportunity to aggregate feedstock across Queensland using the existing rail network.

Way forward

In recognition of the public benefits of the cane rail network, and its significant potential to exponentially scale the biofuels industry in Queensland, we are seeking:

- The establishment of a $60 million Federal Government Cane Rail Fund, that would provide some level of funding for cane rail infrastructure upgrades, particularly those related to safety improvements and flood resilience.
- The inclusion of the cane rail network by Queensland and Federal governments in disaster recovery funding.

The $60 million Cane Rail grant program would ensure the long-term viability of the cane rail network. It would provide up to 25% funding for the total project cost for cane rail infrastructure for projects greater than $10 million (and up to 50% for project costs less than $10 million) with a focus on the expansion of cane rail infrastructure, safety-related improvements (e.g. level crossing infrastructure, structural works on bridges etc.), and flood resilient improvements (e.g. lifting signaling equipment onto platforms etc.)

Access to disaster recovery funding on a 50-50 basis for the cost of repairs (capped at total cost of $10 million) would ensure this vital economic network is maintained for future decades. Funding could focus on 'building back better' for flood resilience, for example rebuilding level crossing signaling equipment on platforms to avoid future flood events.

These programs combined would provide some level of relief to sugar manufacturers for the increasing cost of maintenance of this infrastructure. It would also avoid the significant cost of road maintenance if this freight task was shifted onto regional roads.

Recommendation: The inclusion of cane rail in national disaster recovery support.

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the potential replacement cost today in excess of $2.5 billion. See: Department of Infrastructure and Regional Development (2015), Freightline 3 – Australian sugar freight transport, at URL: https://www.bitre.gov.au/sites/default/files/Freightline_03.pdf

Recommendation: Establishment of a $60 million Cane Rail Fund to provide co-funding for cane rail upgrades.

Biofuels and biogas

The opportunity

Sugar industry feedstocks (bagasse, molasses and cane juice) can potentially provide more than 30% of the domestic aviation fuel market[7], which consumes between 7-9 billion litres of jet fuel annually[8]. The near-term opportunities are focused on the conversion of ethanol to SAF, while the conversion of biomass, such as bagasse, is likely a medium-term opportunity.

These feedstocks, as well as additional feedstocks such as mill mud and dunder, could alternatively be used for the production of biogas. Biogas could be a viable diversification opportunity, particularly where gas pipeline infrastructure is co-located with sugar manufacturing operations.

The market for biofuels and biogas will be determined by government policy, domestically and internationally, noting that these fuels will be more expensive than traditional fossil fuels for the foreseeable future. However, the Federal Government has suggested that it is committed to supply and demand-side incentives to establish these markets.

As the most abundant feedstock in Queensland, sugar provides a huge opportunity for the Queensland Government to leverage Federal funding to establish a nascent industry in regional Queensland and underpin the future of a foundational industry for the state in the form of the sugar industry.

According to the recently released Clean Energy Finance Corporation and Deloitte (2025)[9] research report into low carbon liquid fuels, sugar is the next opportunity that provides a cost-effective pathway for the production of biofuels and carbon abatement at scale. This is particularly important noting that tallow and used cooking oils have limited scale opportunity and have already largely been accounted for in the project pipeline.

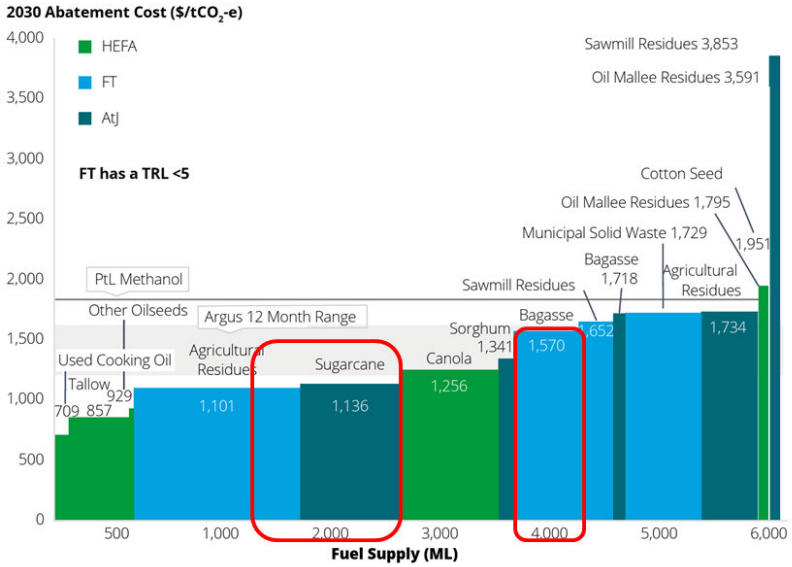
While agricultural residues provide a lower cost approach to abatement for biofuels production at scale, practically it is very hard to aggregate and consolidate this dispersed feedstock. This is in stark contrast to sugar and sugar byproducts, which are all aggregated and consolidated feedstock.

[7] CSIRO (2023)

[8] Queensland Government & Deloitte (2023), Catalysing sustainable aviation fuel (SAF) in Australia, at URL: https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0025/85480/SAF-sust-aviation-fuel-report-summary.pdf

[9] CEFC & Deloitte (2025), Refined Ambitions: Exploring Australia's Low Carbon Liquid fuel Potential, at URL: https://www.cefc.com.au/document?file=/media/jh3gvm14/refined-ambitions-exploring-australia-s-low-carbon-liquid-fuel-potential.pdf

Biofuels feedstock supply and abatement cost



Source: Clean energy Finance Corporation and Deloitte 2025

The sugar industry also has a unique opportunity to assist in securing the fuel security of the Australian Defence Force (ADF). Significant fuel intensive ADF assets are located across Queensland, including naval and air force capabilities, and these are collocated in areas with sugar manufacturing capabilities. The potential to create a short, secure cost-effective biofuels supply chain linking the sugar industry to the ADF is worthy of further investigations.

The challenges

The are significant challenges to the establishment of a biofuels capability through sugar, including:

- Developing a pipeline of shovel-ready projects, if and when government policies induce demand for biofuels at prices that provide commercial returns for producers.
- The significant capital costs establishing a biofuels capability.
- The risks and uncertainty involved with a market that does not as yet exist and that is reliant on ongoing government commitment.

Developing a pipeline of shovel-ready projects

There is a significant risk that demand-side biofuels incentives only create a biorefining capacity reliant on imported bioethanol, not a domestic biofuels capability. This will create very little employment and not address the fundamental concern around Australia's reliance on imported liquid fuel. This is a huge risk for governments touting low carbon liquid fuels as a regional employment driver, as the overwhelming number of jobs to be created from the biofuels boom will be in the domestic supply chain not in biorefining itself.

To date, governments have simply not focused on developing the domestic supply chain, and there is a risk that demand-side incentives will simply embed an imported supply chain based

on Brazilian and Indian bioethanol, essentially providing a subsidy for overseas ethanol producers. This would be a double blow for the sugar industry, not only through a lost opportunity in biofuels, but the provision of a subsidy to Brazil and India to further underpin their sugar industries.

A challenge for the sugar industry in developing domestic supply-side projects that are shovel ready is the significant cost of getting a project through prefeasibility, feasibility and final investment decision analysis. This process typically costs 2% to 4% of total project capital costs, and noting that there is no real biofuels market as yet, and no foreseeable revenue, it is very hard to justify such a spend.

Federal and state governments have funded organisations like GrainCorp and Jet Zero to begin to build the relationships and commercial arrangements that identify and apportion risks, responsibilities and value to build this domestic supply chain. The GrainCorp led consortium was meant to deliver this for the grains supply chain, while the Jet Zero consortium was meant to deliver this for the sugar supply chain. The focus on sugar and grains was due to the cost effectiveness of these feedstocks to provide biofuels at scale.

While the GrainCorp-led consortium has done this for the grains sector, our experience is that these foundational activities have not yet occurred with any great depth within the sugar industry. The ASM understands that Jet Zero is exploring imported ethanol and other feedstocks and technologies, including pongamia[10].

With respect to demand side incentives, biofuels mandates may provide the needed certainty in demand to spur investments in supply. While the focus of discussions have been on sustainable aviation fuel mandates, the most readily available a cost-effective abatement opportunity is the stringent enforcement and expansion of existing state based biofuels mandates for road transportation.

Capital costs, risks & uncertainty associated with the establishment of a domestic supply chain

To establish a domestic supply chain for biofuels through the sugar industry requires significant capital investment. However, the risks and uncertainty associated with a biofuels market makes it very hard to justify the required investments.

Noting domestic and international uncertainty around sustainability, net-zero and energy transition policies, the risk in investing in capital and infrastructure that have useful lives well over 30 years is unquantifiable. Will domestic and overseas governments maintain their commitment to low carbon liquid fuels? Will commitments to domestic and international biofuels mandates stand the test of time?

Other governments, including those in Brazil and India, have heavily invested in building a sovereign capability in bioethanol. Do Australian governments have the same commitment to

[10] See URL: https://www.bioenergyaustralia.org.au/news/media-release-jet-zero-pongamia-trial

supporting the development of a domestic supply chain through what will be challenging and uncertain times as nascent domestic and international markets for biofuels are developed?

Way forward

Policies to ensure a pipeline of shovel-ready projects

The ASM seeks a combination of Queensland and Federal Government to provide grant funding on a 50-50 basis to sugar manufacturers to progress biofuels, biogas and bioenergy related projects through the project pipeline, noting the cost escalation as project moves through pre-feasibility, feasibility and then a Final Investment Decision (FID) analysis. This will ensure the availability of shovel ready projects if and when demand side government incentives do what they set out to do – create demand for biofuels.

Attracting the significant private investment needed in the diversification agenda

To capture opportunities in biofuels, biogas and bioenergy at scale within the sugar industry requires billions of dollars in investments. Noting the significant risks with a developing market, developing a nascent supply chain, and competition from highly subsidised imported biofuels and biofuels feedstocks, the risk associated with such investments are very high. There is a role for governments to derisk these investments through government grant funding and other forms of local producer support.

The focus of government funding should be broader than supporting technology and innovation of the biorefining process – this is only a small part of the diversification challenge. Governments should facilitate technology adoption and process innovation across the physical biofuels supply chain. This includes process innovation and technologies that will liberate and use feedstocks more efficiently. For the sugar industry this is primarily bagasse and to a lesser extent tops and trash.

On 17 September 2025, the Federal Government announced a $1.1 billion in grant funding to promote supply side investments, via competitive tender processes. This is a welcome development.

Recommendation: Provide funding on a 50-50 basis for feasibility and FID analysis in developing a pipeline of shovel ready biofuels and bioenergy projects.

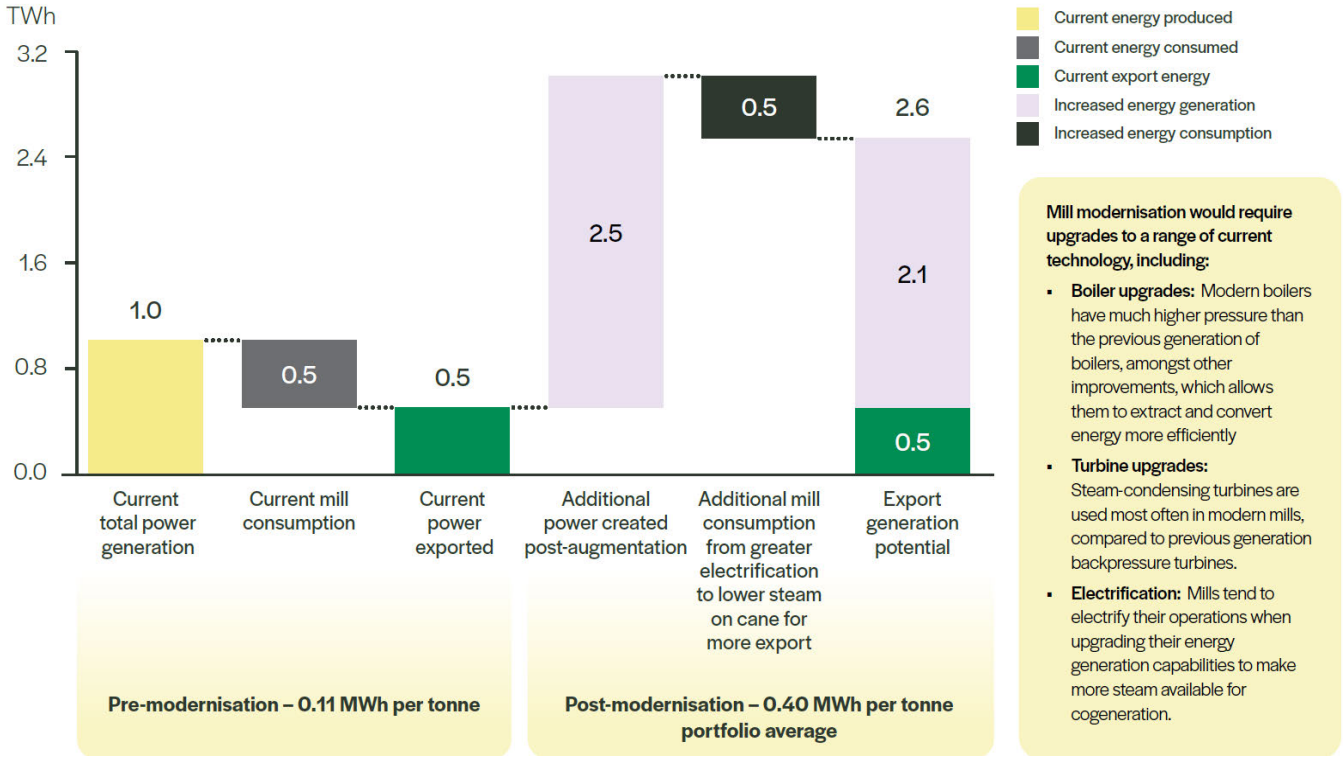
Recommendation: Capital grant funding for innovation, energy efficiency & energy transition.

Bioenergy through the cogeneration of electricity

In 2025, the ASM undertook a prefeasibility into the opportunities of expanding cogeneration outputs from sugar manufacturing[11]. These opportunities include:

- Expanding cogeneration capacity from approximately 400MW to 835MW of installed capacity – if properly utilised, this is enough power for 500,000 Queensland homes.
- Provide up to an additional 2.1-terawatt hours of electricity to the National Electricity Market (NEM) through the above-mentioned expansion and better utilisation of existing capacity, quadrupling the electricity available for export to the grid.
- Leveraging existing know-how within the sugar industry, with expertise in technology, and a good understanding of operating in a mature market.

Pathway to increasing capacity and utlisation of cogeneration

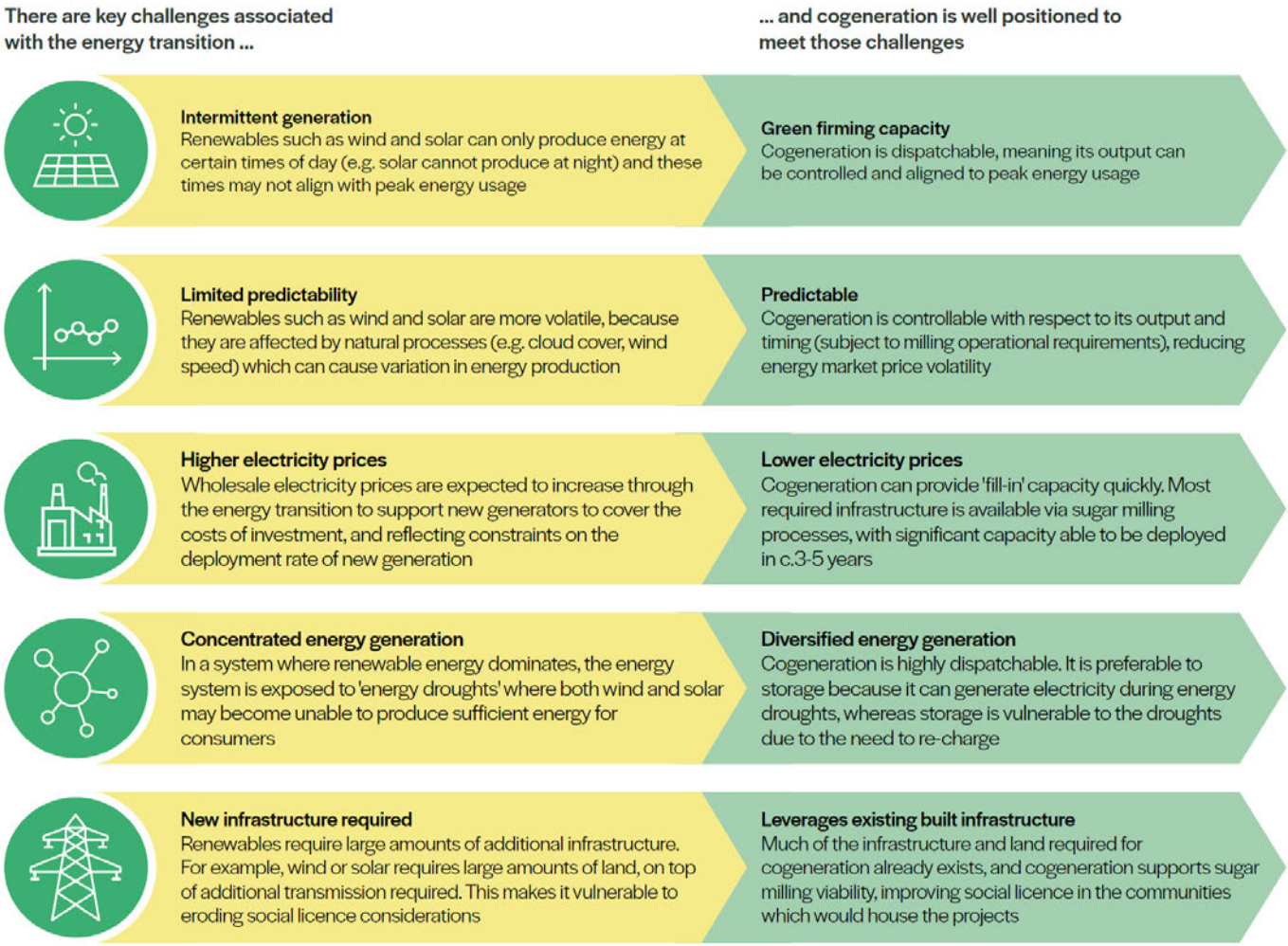


Source: ASM (2025)

Cogeneration provides one of the few sources of baseload renewable electricity, and expansion would create between $9 billion and $15 billion of benefits to the NEM to 2050 (using AEMO Integrated Systems Plan forecasting of electricity supply and demand) and reduce GHG emissions by 1.3 million tonnes in 2030. Cogeneration also has a very small physical footprint, creating less community concern from a social licence perspective as compared to solar or wind generation projets.

[11] ASM (2025), Bioenergy Fund Project – Electricity Cogeneration in the Sugar Industry, yet to be published.

Opportunities and challenges with cogeneration



Source: ASM (2025)

The challenges

There are significant commercial, market regulation and operational challenges to securing investments to expand cogeneration capacity. The commercial challenge is first and foremost, with sector-wide investment potentially running into the billions, an amount difficult to justify noting that baseload power generators are not rewarded for their reliability in the Australian electricity market.

Despite providing baseload power, with the ability to displace the need for very expensive long duration batteries and gas peaking generators, the electricity market does not recognise this benefit. Based on our prefeasibility analysis, this benefit would reduce electricity generation prices by over a billion dollars per annum in the 2030s, yet there is no market payment to incentivise the capturing of this benefit.

The NEM is not focused on making the market work for all generation types, with a bias towards large scale wind and solar. These generation forms have received significant subsidies for many decades and their non-synchronous intermittent nature has created significant operational issues for the national grid. To solve this problem, governments have provided proponents of solar and wind power further subsidies, via direct grant funding and the Capacity Investment Scheme (a program not available to the sugar industry), to address a problem inherent in their form of intermittent non-synchronous power generation.

The large-scale adoption of wind and solar has created further problems for generators, such as sugar cogeneration, who provide continuous baseload power. The intermittent nature of these generation sources create periods in the NEM with negative prices, forcing baseload power generators to run at significant losses to export power into the grid. The nature of sugar factory cogeneration is that electricity is primarily produced in conjunction with process steam required for factory operations. As a result, we cannot significantly ramp down our generation to mitigate exposure to these losses, nor ramp up generation to utilise the significant revenues stemming from the supply shocks created by intermittency. This will hinder investment in cogeneration expansion and challenges the viability of existing cogeneration capacity.

Operationally, market regulators and network providers are not interested in facilitating the connection of our energy generation capacity to the network, preferring to use the opportunity to upgrade their networks at our cost. This is particularly the case if the generation capacity seeking to come online is in a grid constrained area. Similarly, the time it takes for market regulators and network providers to provide access to the network can be counted in years, creating yet another financial barrier for cogeneration.

This complexity, bureaucracy and needless cost essentially creates a closed shop for incumbent generation providers, who were envisaged as the prime stakeholders when market rules were written, and are the only ones with sufficient scale and experience to navigate this complexity.

These challenges are growing more acute over time, not only challenging the business case for investment in new cogeneration capacity, but the utilisation of existing capacity. The quantum of benefits that cogeneration provides to the NEM outweighs the costs, yet the market does not facilitate or incentivise the participation of cogeneration.

The way forward

The Federal Government can ensure the continued benefits of cogeneration, by considering offtake agreements for sugar cogeneration that recognise the additional benefits of cogeneration beyond its renewable status (baseload power, mitigant against peak demand events etc.).

It should be noted that nearly all generation sources, whether legacy fossil fuel generation or more recent renewable generation, have had government investment support to establish that generation.

An offtake agreement with a fixed price or a floor price will help maintain and expand the amount of electricity generated by the sugar manufacturing sector through cogeneration, by reducing exposure to the highly volatile national electricity market, particularly negative pricing, and can fill the significant financial gap created by the collapse of prices for Largescale Generation Certificates. It should be noted that the sugar industry does not have access to the Capacity Investment Scheme.

In Japan, 3-4% of electricity is generated from biomass thanks to incentives and offtake agreements for biomass to energy proponents. Current agreements provide a price equivalent $200 per MWh in Australian dollars which would be sufficient to encourage expansion of existing sugar factory cogeneration if it could be provided under a long-term offtake agreement.

Recommendation: Provide funding on a 50-50 basis for feasibility and FID analysis in developing a pipeline of shovel ready biofuels and bioenergy projects.

Recommendation: Exploration of offtake agreements for sugar cogeneration (with a floor price) in recognition of its baseload synchronous benefits, and to limit exposure to negative market pricing caused by intermittent generators.

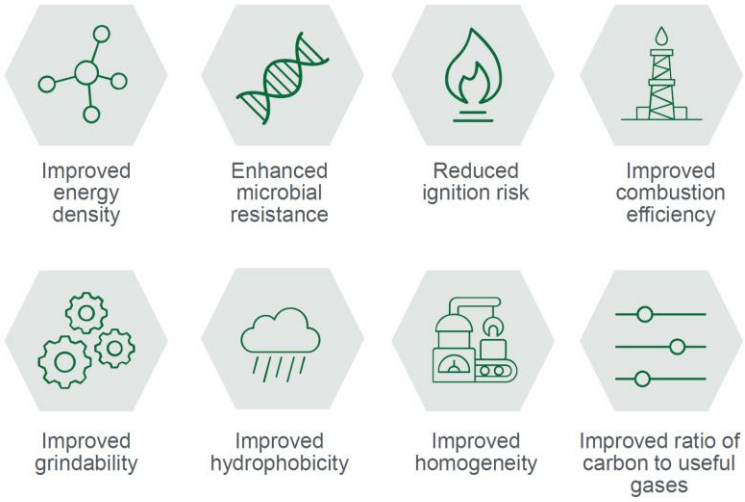
Pelletisation of bagasse

The opportunity

The pelletisation of bagasse could be a no-regret solution for industry and government to invest in the diversification towards biofuels and bioenergy. Pelletisation refers to using biomass from the sugar industry, including bagasse and tops and trash, and densifying them into pellets that can be easily transported and used in a variety of ways including:

- Green power generation through the use of the pellets to displace coal .
- Can be used as a feedstock for various energy sources, including biogas.
- Could potentially be sold for export to markets like Japan.

Benefits of bagasse pelletisation



Source: ASM (2025)

Pelletisation technology can be extended to the use of other feedstock, including tops and trash and forestry residues, if logistical and commercial challenges can be overcome. This provides an opportunity to scale. As an example, there is approximately the same amount of tops and trash on farm as there is bagasse within sugar manufacturing facilities.

Developments in the pelletisation process and its potential commercial viability are advancing quickly. This bodes well for its potential commercial applications going forward.

The challenges

The market for pelletised biomass is in its infancy and the commercial risks are hard to assess. The ASM believes that with the net zero agenda, biomass pelletisation could be a solution to the energy transition journey of hard to abate sectors including metal smelting and coal fired power generators, providing a renewable source of fuel for furnaces and boilers.

The way forward

The pelletisation pathway can link into multiple biofuels, biogas and bioenergy supply chains. This includes government support and collaboration for activities, such as pilot testing, to progress the pelletisation agenda as part of the broader diversification agenda.

Recommendation: Provide funding on a 50-50 basis for feasibility and FID analysis in developing a pipeline of shovel ready biofuels and bioenergy projects.

Recommendation: Capital grant funding for innovation, energy efficiency & energy transition.

Research and development

The sugar industry R&D capability is not fit-for-purpose nor is it adequately resourced to ensure core capabilities for existing sugar production (variety development and disease/pest management), and to tackle the R&D challenges and opportunities associated with advanced sugar manufacturing and diversification.

Sugar Research Australia, the main vehicle for sugar industry R&D, is one of the smallest research and development corporations in Australia, and its current resourcing and expertise means that a focus on core tasks such as varietal development for yield improvements and disease/pest resistance is likely the upper bounds of the R&D task it can provide.

Manufacturing R&D has largely been ignored by the industry's R&D agenda. Despite the sugar manufacturing sector putting nearly $10 million per annum into SRA - SRA has indicated it has limited expertise and resources to undertake manufacturing R&D going forward.

This is to be contrasted to the resources available to other agricultural commodities. The grains industry can leverage their financial resources dedicated to R&D to capture biofuels opportunities and government grant funding. The Grains Research and Development Corporation (GRDC) has approximately $757 million in cash reserves and managed investments[12], and can quickly mobilise to capture competitive grant funding opportunities for the grains industry. As an example, the GRDC funded and released the Low Carbon Liquid Fuels Roadmap[13], in anticipation and response to the Federal Government's announcement of the $1.1 billion Cleaner Fuels Program, to position the grains industry at the front of the queue for any announced competitive grants process.

This mismatch in resources puts the sugar industry at a disadvantage in getting support and traction for its biofuels pathways.

The ASM welcomes state and federal government support for projects, such as the Mackay Renewables Bio Commodities Pilot Project, that is looking at long-term opportunities in biomanufacturing including technology development for processes such as precision fermentation. Yet this still misses the main R&D task needed to support the establishment of a biofuel and bioenergy capability.

The main R&D challenge with respect to biofuels and bioenergy opportunities are process innovations to better tailor, adopt and utilise new and existing technologies that will liberate feedstock for the production of bio-products, and projects focusing on technology transfer into the sugar manufacturing sector to move the sector up the innovation curve and support the

[12] Grain Research and Development Corporation (2025), Annual Report 2024-2025, at URL: https://grdc.com.au/__data/assets/pdf_file/0034/627847/grdc-annual-report-2024-25.pdf

[13] Grain Research and Development Corporation (2025), Low Carbon Liquid Fuels Roadmap, at URL: https://grdc.com.au/resources-and-publications/all-publications/publications/2025/low-carbon-liquid-fuels-roadmap?_gl=1*n41qjg*_ga*MTk2MzIxMzExNS4xNzYwNTY1OTAw*_ga_ZTGWWXHVRC*czE3NjA5NDg2NzMkbzIkZzEkdDE3NjA5NTAwODkkajUzJGwwJGgw

sector's diversification aims. This agenda has largely been ignored by governments and Sugar Research Australia alike.

Australian sugar manufacturing cannot afford to simply reinvest in equipment and industrial processes like for like, this is simply unviable. The sector needs to adopt technologies and innovative processes that will provide a step change in productivity for the capital that can be invested and also support diversification of revenue streams. This is the core R&D activity needed.

It is foolhardy to suggest Australia, let alone the sugar industry, should spend limited R&D funding on technology development, where global developments will likely overtake our endeavors. It would be more prudent to focus on technology adoption, and process innovation that is closer to the coalface of commercialisation.

The way forward

There is an opportunity for co-investment between industry, Queensland Government and Federal Government to establish a $24 million advanced sugar manufacturing R&D capability focused on technology adoption and transfer.

Industry may be able to put forward $6 million seed funding that is available as a reserve within Sugar Research Limited (an industry funded organisation focused on research), to be matched by Queensland Government, and the Federal Government match the industry and Queensland Government contribution. This would provide $24 million for a robust advanced sugar manufacturing R&D program.

Sugar Research Australia could provide funding for operational expenses, in lieu of not undertaking any manufacturing R&D itself on behalf of the sugar manufacturing sector.

Recommendation: Government-industry co-investment towards a $24 million R&D capability for advanced sugar manufacturing.

Government policies – international and other industry experience

Markets for sugar, biofuels and even bioenergy are global in nature, and Australian governments must be cognisant of global developments and government policies in calibrating their domestic policy response.

Globally, sugar and biofuels production is seen as a sovereign capability in food and fuel production, and a hedge against food and fuel insecurity and worthy of supportive government policies that underpin its ongoing commercial operation. Much like how China views steel production and critical minerals as strategic industries to invest in, Brazil and India have similar views towards the sugar industry.

The centrality of ongoing government commitment to the development of a domestic biofuel and bioenergy capability is exemplified by the shockwaves created amongst UK biofuels producers, when a US-UK trade deal abolished the 19% UK tariffs on US ethanol. The two major producers, Vivergo and Ensus, who account for nearly all of the UK's biofuels production, have suggested that the removal of the tariff has made operating in the British market 'impossible'.[14]

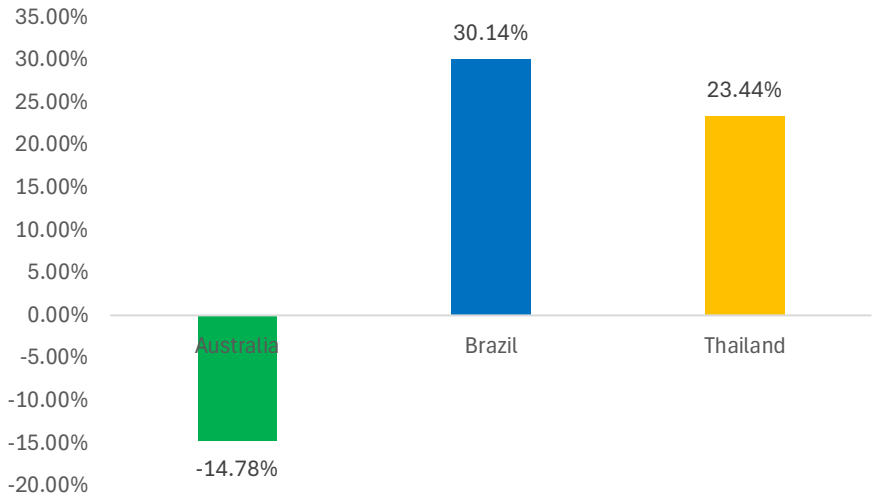
While Australian governments are generally hesitant towards a proactive industry policy, in response to increasing global moves towards protectionism, Australian governments have embraced government-industry collaboration and investments in maintaining and growing sovereign capabilities in trade exposed industries, such as steel, timber and forestry.

The sugar industry should be seen as no different. Governments in all major sugar producing nations have invested heavily in promoting diversification in the sugar industry. Governments from Brazil, India and Thailand have worked with their sugar industries to not only underpin sugar production but build capabilities into biofuels, bioenergy and other value-add products. This is a missed opportunity for Australia.

While bioethanol output has increased by more than 30% in the Brazilian and Thai sugar industries, in Australia we have seen a reduction of approximately 15% in bioethanol output since 2014.

[14] Reuters (2025), Britain will not bail out bioethanol industry hit by Trump trade deal, 16 August, at URL: https://www.reuters.com/business/healthcare-pharmaceuticals/britain-will-not-bail-out-bioethanol-industry-hit-by-trump-trade-deal-2025-08-15/

% Change in Bioethanol Output (2014-2023)[15]



Diversification into biofuels and bioenergy in countries like Brazil, Thailand and India only successfully occurred with long-term government-industry collaboration and investment.

The Australian sugar industry has the expertise and know-how to deliver on a diversification agenda. Noting the global context, this diversification agenda requires government-industry collaboration and investment.

International experience with policies to promote sugar derived biofuels

Brazil

Brazil is the second largest producer of ethanol and the third largest producer of biofuels. Sugar can account for up to 90% of this production, and it can reliably make 30 billion litres of ethanol annually through the sugar supply chain. The Brazilian sugar industry is a dual output industry, enabling it to divert production into either sugar or ethanol depending on market prices.

Brazil's position as a global power in biofuels has largely been driven by Brazilian Government policies and producer and consumer incentives. In 1975, to build a domestic biofuels supply chain the Brazilian Government implemented stringent ethanol mandates via the Pralcool Program, with ethanol fuel blend mandates ranging between 20-30%.

To maintain and grow this capability, the Government further established the ReovaBio program, a decarbonisation credit scheme, obligating fuel distributors to meet decarbonisation targets through the use of biofuels or purchase credits from others to meet this obligation. The creation of the carbon credit market has provided the needed revenues to make investment in biofuels infrastructure viable for the Brazilian sugar industry.

[15] Data extracted and adapted from International Sugar Organisation Yearbook (2024)

To protect the Brazilian biofuels industry from international competition, the Government introduced 18% tariffs on imported bioethanol. There has been a suite of other measures provided to support and promote the development of a sugar industry-based bioethanol capability including access to discounted development loans.

India

India is estimated to produce 10.5 billion litres of ethanol in 2025[16]. This production is almost entirely underpinned by government policy, with a E20 mandate driving demand, while there is an absolute ban on ethanol imports for fuel blending.

India is further developing biofuels market with the Government setting ambitious blending targets for its Sustainable Aviation Fuel (SAF) program. The country aims to achieve a blending target of 1 percent by 2027, 2 percent by 2028, and 5 percent by 2030 for international flights. The Government also provides offtake agreements with guaranteed prices for bioethanol production, provides gap funding to make bioethanol projects viable, and provides concessional loans to biofuels proponents.

The United States

The United States is the largest producer of bioethanol, though this mainly comes from corn. This dominant position has been forged through significant government investment and incentives. This includes (not an exhaustive list)[17]:

- *Renewable Fuel Standard:* The Standard requires renewable fuels to be blended into the national fuel supply, effectively ensuring all petrol sold in the US contains 10% ethanol.
- *The Advanced Biofuels Feedstock Incentives:* A program that provides up to 50% of the cost of establishing, producing or delivering biomass feedstock crops, as well as annual payments of up to $USD20 per dry tonne of biomass produced for up to five years.
- *Advanced Biofuels Production Payments:* Production payments to fuel producers who can demonstrate the use of renewable biomass in their biofuel.
- Loan guarantees for the development of biofuels infrastructure across the supply chain
- Significant government funding for research and development into biofuels and biomass.
- Tax credits for investment in biofuels infrastructure and clean fuel production credits.
- Biofuels and bioethanol infrastructure grants.

International experience in promoting biomass to energy

Japan is a leader in utilising biomass for the production of renewable electricity, with approximately 3-4% of all energy coming from biomass to energy. The Japanese Government is

[16] United States Department of Agriculture (2025)
[17] US Department of Energy (2025), see URL: https://afdc.energy.gov/fuels/laws/ETH?state=US

actively promoting the increased utilisation of biomass to energy, seeing it as one of the most cost-effective ways to meet its growing energy demands while reducing energy emissions.

This significant growth in biomass to energy has been achieved through a program of feed-in tariffs (FIT) established specifically for biomass. The FIT provides the equivalent total revenue of approximately $AUD 200 per MWh for biomass generation.

Government policies towards other Australian industries

Steel industry

The Australian Government has made clear its intention to support and maintain industries, like the steel industry, noting the need to maintain and grow sovereign capabilities in steel production and fabrication[18]. The rationale for this support includes:

- Ensuring inputs are available for the construction and manufacturing sectors in Australia.
- Supporting an industry that is heavily trade exposed and is subject to highly subsidised imported competition.
- Assisting an energy-intensive industry through the energy transition process.

Above and beyond rescue packages for the Whyalla Steel Works, which has provided $2.4 billion of funding, federal and state governments have provided a suite of financial and policy supports to the steel industry, including (but not limited to):

- The establishment of the $1 billion Green Iron Fund to promote green iron manufacturing.[19]
- Funding via the Future Made in Australia initiative for green metal projects.
- $200 million to future proof regional steel manufacturing in NSW via the Powering Regions Fund. [20]
- The development (in-progress) of local content quotas and targets for Australian steel for domestic projects, particularly in the renewables sector.

Timber and forestry industries

Similarly, Australian Governments have lent significant support to the timber and forestry industry, noting its role in providing vital construction and packaging materials. Support has included (but not limited to):

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[18] Australian Government (2025), Media release: Albanese Government backs Australia's steelmaking future, 21 February, at URL: https://www.pm.gov.au/media/albanese-government-backs-australias-steelmaking-future#:~:text=While%20we%20make%20around%205.7,clean%20energy%20transition%2C%20like%20cables

[19] See above

[20] Australian Government (2024), Media release: $200 million to help future-proof regional steel manufacturing, 31 January, at URL: https://www.minister.industry.gov.au/ministers/husic/media-releases/200-million-help-future-proof-regional-steel-manufacturing#:~:text=BlueScope%20has%20been%20awarded%20$136.8%20million%20towards,producing%20even%20lower%2Demissions%20steel%20in%20the%20future.

- Energy transition and energy efficiency grants to paper milling[21] to upgrade energy inefficient equipment and for the establishment of a waste to energy facility.
- $100 million in grant funding for the Accelerate Adoption of Wood Processing Innovation Program – providing grant funding to adopt technologies in timber processing.[22]
- The establishment of the $100 million Australian Forest and Wood Innovations Program to ensure that the R&D agenda drives the long-term viability of the timber and forestry sector.[23]
- The Support Plantation Establishment Program, providing infrastructure grants of $2000 per hectare for the establishment of new timber plantations.[24]

[21] See URL: https://www.pbo.gov.au/elections/2025-general-election/2025-election-commitments-costings/Boyer%20Paper%20Mill
[22] See URL: https://www.agriculture.gov.au/agriculture-land/forestry/industries/accelerate-adoption-of-wood-processing-innovation-program#:~:text=The%20Accelerate%20Adoption%20of%20Wood,reduce%20the%20industry's%20carbon%20footprint.
[23] See URL: https://www.agriculture.gov.au/agriculture-land/forestry/national/australian-forest-and-wood-innovations
[24] See URL: https://www.agriculture.gov.au/agriculture-land/forestry/industries/support-plantation-establishment-program

Recommendations

1. To ensure that there is a shovel ready pipeline of sugar biofuels and bioenergy projects are available when demand side policies are implemented, the ASM seeks Federal and Queensland **government funding towards feasibility and final investment decision studies**. (**$9 million** in total funding by the Federal Government).
2. **Capital grant funding for innovation, energy efficiency & the energy transition ($90m):** To ensure that the industrial and supply chain infrastructure provided by the sugar manufacturing sector is available for the production of biofuels and bioenergy, a grant program for capital projects should be stablished to encourage innovation and technology adoption within sugar manufacturing, promote energy transition imperatives through facilitating energy efficiency and feedstock liberation, and energy production programs.
3. The colocation of the Sugar Industry near Australian Defence Force assets (naval and air force capabilities) provides a win-win opportunity in creating a secure and reliable biofuels supply chain that will assist with the fuel security of the ADF. The ASM recommends **funding a pre-feasibility for a sugar biofuel supply chain with the ADF ($1 million).**
4. Government-industry co-investment towards a **$24 million R&D capability for advanced sugar manufacturing**, with a focus on technology adoption and research that is at the coalface of commercialisation. (**$12 million** funding from Federal Government)
5. Noting the centrality of the cane rail network for the aggregation of biofuels and bioenergy feedstock, and the increasing cost of maintaining this network due to extreme weather events, the ASM recommends that:
    - Federal and Queensland governments **include cane rail infrastructure in national disaster recovery support** (**$9 million**).
    - The Federal Government establish a **$60 million Cane Rail Fund** to provide co-funding for cane rail upgrades, particularly for bridges and level crossings .
6. To create demand for biofuels, the ASM recommends that the Queensland Government advocate with industry for **a national biofuels mandate** with requirements for a portion of the mandate to be filled with local feedstocks and a strong weighting in preference of feedstocks with the lowest carbon intensity profile - a potential initial 2% drop-in mandate, rising over time.
7. **Incentives for increasing cane supply ($10 million):** Cane supply will be a key determinant . The ASM proposes several initiatives (including those put forward by Canegrowers) to help maintain and grow the cane supply, including:
    - Incentives to convert land back to cane land (focus on incentives for on-farm water infrastructure and full utilization of allocated water for new land under cane).
    - Initiatives to secure the future of the harvesting sector.
8. Assist with **access to finance** for sugar manufacturers with a cooperative organisational structure (cooperatives have difficulty in securing access to finance).

9. Noting the significant benefits of cogeneration, explore opportunities for **offtake agreements with sugar manufacturers,** for both existing and new facilities with either fixed or floor pricing**,** in recognition of the benefits of the baseload nature of the generation.
10. This could be delivered as a part of an holistic **sugar industry diversification strategy**, similar to the National and Queensland timber industry strategies.

Total cost of package: Approximately $182 million

Conclusion

Capturing the opportunities in biofuels, biogas and bioenergy at scale will develop a sovereign capability in liquid fuel and energy for Australia and secure the long-term viability of the sugar manufacturing sector and the sugar industry that supports more than 20,000 regional jobs.

While the opportunities are great, there are challenges and barriers to overcome, requiring a coordinated government-industry approach. This is not a one size fits all solution, and actions and activities cut across a myriad of portfolios including physical supply chains, research and development, and skills and workforce. Potentially a government-industry roundtable will be a good mechanism to establish a framework to progress the biofuels and bioenergy agenda nationally.

To discuss this submission further, please contact Mr Ash Salardini, Chief Executive Officer [redacted].

Yours sincerely

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