

Submission to the Joint Standing Committee on Northern
Australia on Preparing for Emerging Industries Across Northern
Australia – 5 December 2025

TABLE OF CONTENT

Executive summary	page 2
The challenge: Biofuels and bioenergy markets are reliant on government policy and investment domestically and globally	page 6
The way forward – Biofuels, bioenergy and sugar	page 6
Government policies – international & other industry experience	page 20
Recommendations	page 25
Conclusion	page 26

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 for Northern Australia and in building a sovereign biofuels and bioenergy capability

The Australian sugar industry is vital to the current and future fortunes of Northern Australia. It is Queensland's second largest agricultural export, and a major provider of manufacturing jobs up and down the Queensland coast.

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 nine 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 demand¹ (not including the utilisation of tops and trash).
- Baseload renewable electricity generation (835MW of potential capacity²) through cogeneration – enough power for nearly 500,000³ 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.
- As 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

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.

energy production using other feedstocks (such as hardwood residues and agricultural waste).

- Significant longer-term opportunities in biomanufacturing, including bioplastics and alternative proteins.

Barriers for a biofuels and bioenergy industry in Northern Australia

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 from 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 the 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, USA 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

The long-term future viability of the sugar industry in North Queensland is by no means certain and requires active state and federal government collaboration and investment.

The ASM urges the Committee and the Federal Government not to neglect the role of existing industries in underpinning the economies of local communities across Northern Australia. Not only would the loss of an industry, like the sugar industry, be a huge body blow to regional Queensland economies, but it will rob these economies of the opportunity to participate in new

markets for low carbon liquid fuel, create jobs and economic uplift through the net-zero agenda, and to assist in securing the Australian Defence Force's liquid fuel security.

Countries like India and Brazil heavily subsidise their sugar industries, treating them as sovereign capabilities for food and liquid fuel security. Similarly, the US and EU governments erect significant barriers for exporting countries to access to their domestic sugar markets, while providing market protections and subsidies for biofuels. By comparison, the Australian sugar industry is unprotected, unsubsidised and highly trade exposed.

This threatens a regional industrial manufacturing capability that supports regional jobs and Queensland economies. With a replacement cost in excess of \$20 billion, the transport, logistics and processing capabilities the sugar manufacturing sector provides for the production of low carbon liquid fuels, sugar-based biofuels and bioenergy feedstocks is irreplaceable.

The Australian Government cannot waste the opportunity to leverage the regional industrial capability provided by the sugar manufacturing sector as an enabler for the development of sugar-based biofuel and bioenergy industry. 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 Australia, the sugar industry sees biofuels, biogas and bioenergy as a clear path to long-term viability that will continue sugar's economic contribution to Northern Australia while providing new jobs and economic opportunities through the bioeconomy.

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 a holistic **sugar industry diversification strategy**, similar to the National and Queensland timber industry strategies.

Total cost of package: Approximately \$182 million over ten years

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 for Northern Australia. However, the long-term viability of 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 industries 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.

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 4,000 km 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 other agricultural and forestry residues 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 (fats and oils) 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 expand HEFA feedstock availability issues increases carbon abatement costs compared to that of used cooking oil, tallow and sugar-derived biofuels.⁴

Many proposed HEFA plants, including Shell's proposed Rotterdam plant⁵, 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 billion⁶, is becoming a large impost on sugar manufacturers. This has been compounded by the impact on

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 the potential replacement cost today in excess of \$2.5 billion. See: Department of Infrastructure and Regional

cane rail networks from the increasing incidence of natural disasters and adverse weather events due to the changing climate.

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 increasing cost of maintaining rails networks has meant sugar manufacturers are actively considering reducing the footprint of their networks and moving 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 Northern Australia, 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 above flood levels 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 elevated 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.

Development (2015), Freightline 3 – Australian sugar freight transport, at URL:
https://www.bitre.gov.au/sites/default/files/Freightline_03.pdf

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

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 market⁷, which consumes between 7-9 billion litres of jet fuel annually⁸. 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 joint Queensland Government and 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, after tallow and used cooking oil, sugar is the next most commercially viable 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

⁷ CSIRO (2023)

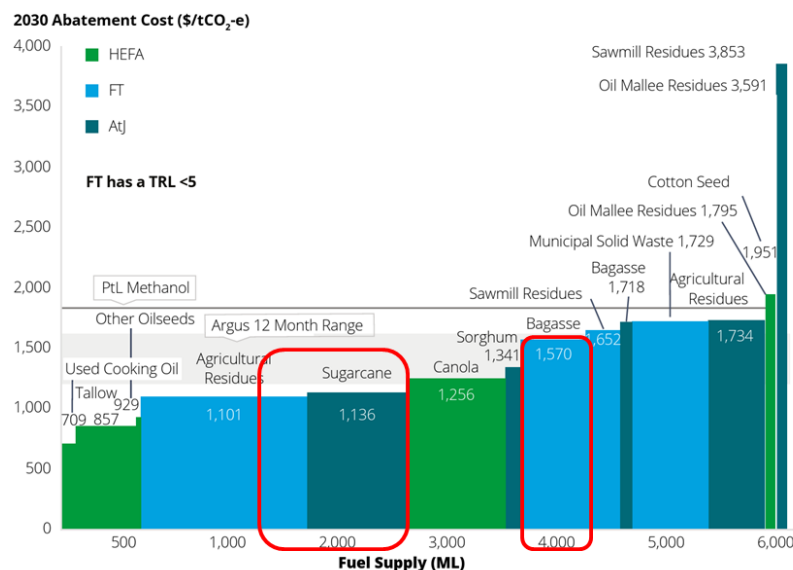
⁸ Queensland Government & Deloitte (2023), *Catalysing sustainable aviation fuel (SAF) in Australia*, at URL: https://www.statedevelopment.qld.gov.au/_data/assets/pdf_file/0025/85480/SAF-sust-aviation-fuel-report-summary.pdf

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>

the project pipeline. Furthermore, biofuels derived from sugar typically have very low carbon emissions compared to biofuels derived from other feedstocks.

While agricultural residues provides a scalable pathway for biofuels production, due to the abundance of the feedstock, practically it is very hard to aggregate and consolidate this dispersed feedstock. This is in stark contrast to sugar and sugar byproducts, which already provide a source of aggregated and consolidated feedstock.

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 north Queensland, including naval and air force capabilities, and these are co-located in areas with sugar manufacturing capabilities. The potential to create a short, secure and cost-effective biofuels supply chain linking the sugar industry to the ADF is worthy of further investigations.

An area of absolute policy neglect is the promotion of increased uptake of bioethanol as a drop-in fuel for land transport, which provides the most cost-effective carbon abatement potential of any of the biofuels mentioned.

The challenges

There 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 promoting low carbon liquid fuels as a regional employment driver, as the overwhelming number of jobs to be created from the biofuels boom will be offshore.

To date, governments have not focused sufficiently on developing the domestic supply chain, and there is a risk that simply implementing demand-side incentives will embed an imported supply chain based on offshore bioethanol production, 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 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. In the absence of an established regulatory framework supporting a biofuels market, it is very hard to justify such investment in project development.

Federal and state governments have funded organisations like GrainCorp and Jet Zero to undertake feasibility studies into biofuel projects. These studies are necessary to support building relationships and commercial arrangements that identify and apportion value, risks and responsibilities to build this domestic supply chain. The GrainCorp led consortium was to deliver this for the grains supply chain, while the Jet Zero consortium was 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 appears to have 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 has no commercial agreements in place with the sugar industry and is exploring other feedstocks and technologies, including pongamia¹⁰.

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 has been on sustainable aviation fuel mandates, the most readily available and cost-effective abatement

¹⁰ Bioenergy Australia: <https://www.bioenergyaustralia.org.au/news/media-release-jet-zero-pongamia-trial>

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 the domestic biofuels market in the context of the current regulatory environment makes it impossible to justify the required investments.

Noting domestic and international uncertainty around sustainability, net-zero and energy transition policies, the risk in investing in infrastructure that has a 30 year return horizon 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 underpinned by a comprehensive and stable supportive regulatory framework. Do Australian governments have the same commitment to 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 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 projects move 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 help de-risk 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.

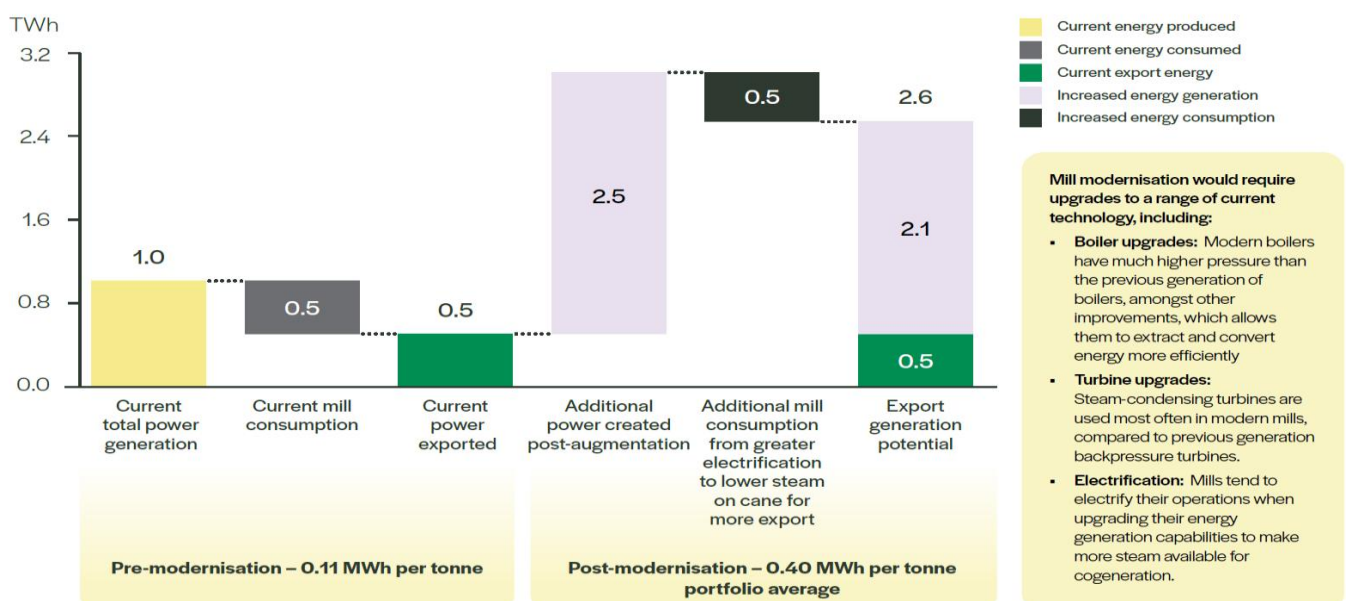
Recommendation: Capital grant funding for innovation, energy efficiency & energy transition.

Bioenergy through the cogeneration of electricity

In 2025, the ASM undertook a prefeasibility into the opportunities of expanding cogeneration outputs from sugar manufacturing¹¹. These opportunities include:

- Expanding cogeneration capacity from approximately 400MW to 835MW of installed capacity - 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 utilisation of cogeneration



Source: ASM (2025)

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

Sugar manufacturing 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 projects.

Opportunities and challenges with cogeneration

There are key challenges associated with the energy transition ...

... and cogeneration is well positioned to meet those challenges



Intermittent generation

Renewables such as wind and solar can only produce energy at certain times of day (e.g. solar cannot produce at night) and these times may not align with peak energy usage

Green firming capacity

Cogeneration is dispatchable, meaning its output can be controlled and aligned to peak energy usage



Limited predictability

Renewables such as wind and solar are more volatile, because they are affected by natural processes (e.g. cloud cover, wind speed) which can cause variation in energy production

Predictable

Cogeneration is controllable with respect to its output and timing (subject to milling operational requirements), reducing energy market price volatility



Higher electricity prices

Wholesale electricity prices are expected to increase through the energy transition to support new generators to cover the costs of investment, and reflecting constraints on the deployment rate of new generation

Lower electricity prices

Cogeneration can provide 'fill-in' capacity quickly. Most required infrastructure is available via sugar milling processes, with significant capacity able to be deployed in c.3-5 years



Concentrated energy generation

In a system where renewable energy dominates, the energy system is exposed to 'energy droughts' where both wind and solar may become unable to produce sufficient energy for consumers

Diversified energy generation

Cogeneration is highly dispatchable. It is preferable to storage because it can generate electricity during energy droughts, whereas storage is vulnerable to the droughts due to the need to re-charge



New infrastructure required

Renewables require large amounts of additional infrastructure. For example, wind or solar requires large amounts of land, on top of additional transmission required. This makes it vulnerable to eroding social licence considerations

Leverages existing built infrastructure

Much of the infrastructure and land required for cogeneration already exists, and cogeneration supports sugar milling viability, improving social licence in the communities which would house the projects

Source: ASM (2025)

The challenges

There are significant commercial, market regulation and operational challenges to securing investments to expand sugar manufacturing 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 sugar manufacturing cogeneration 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, expansion of sugar manufacturing cogeneration has the capacity to reduce electricity generation prices by over a billion dollars per annum in the 2030s, yet there is no market payment to incentivise 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 manufacturing cogeneration, that provides continuous baseload power. The intermittent nature of wind and solar 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 industry 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 challenge the viability of existing cogeneration capacity.

Operationally, market regulators and network providers appear disinterested 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 viability of existing capacity. The quantum of benefits that sugar manufacturing cogeneration provides to the NEM outweighs the costs, yet the market does not facilitate or incentivise the participation of sugar manufacturing cogeneration.

The way forward

The Federal Government can ensure the continued benefits of sugar manufacturing sector cogeneration, by considering offtake agreements 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 Large Scale Generation Certificates (LGCs). 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 because of 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 manufacturing 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 manufacturing cogeneration (with a floor price) in recognition of its baseload synchronous benefits, and to limit exposure to negative market pricing caused by intermittent generators.

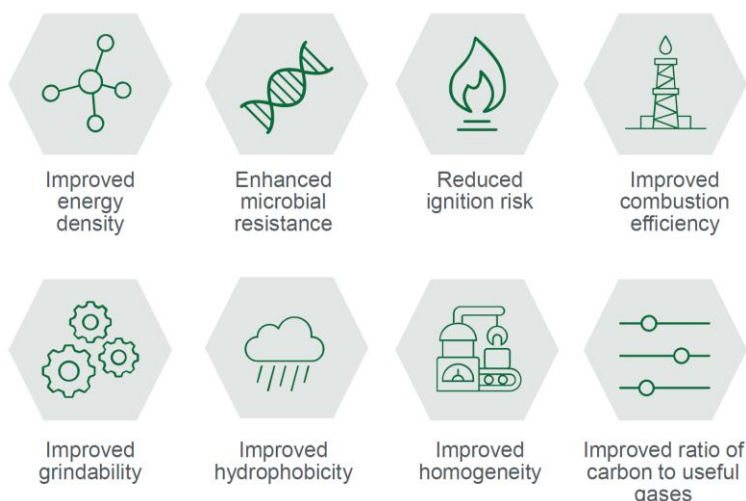
Pelletisation of bagasse

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 products, including biogas.
- Could potentially be sold for export to markets like Japan.

Benefits of bagasse pelletisation



Source: ASM (2025)

Pelletisation technology can be extended from bagasse 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 farms 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. To establish a pelletisation capability, government support and collaboration for activities, such as pilot testing, is required 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 cane 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 sugar 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 investments¹², 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 Roadmap¹³, 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 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 leaves the R&D task needed to support the establishment of a biofuel and bioenergy capability unsupported.

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 improve productivity and innovation and support the sector's

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*cZ3NjA5NDg2NzMkbzlkZzEkdDE3NjA5NTAwODkkaUzJGwwJGgw

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 develop and 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.

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 the Queensland Government, and the Federal Government to match both 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 the administrative support for such an R&D program, 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.

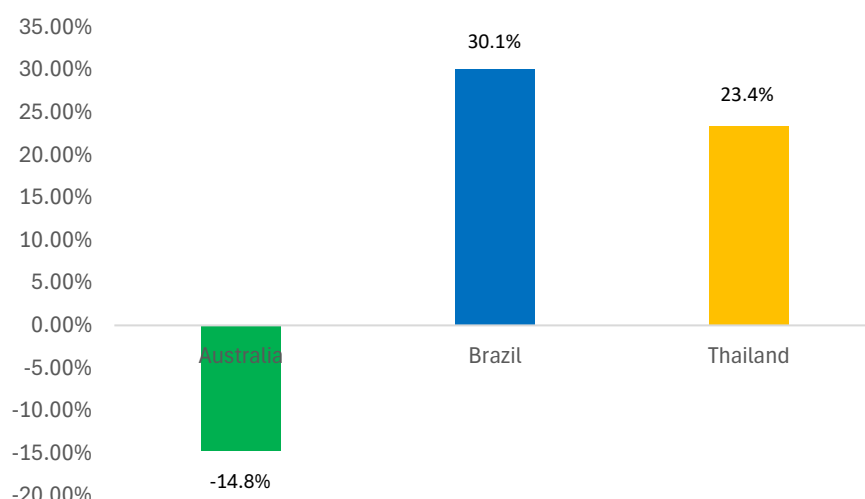
The importance of stable ongoing government commitment to the development and maintenance of a sustainable domestic biofuel and bioenergy capability was exemplified by the shockwaves created amongst UK biofuels producers, when a US-UK trade deal abolished the 19% UK tariffs on US ethanol. The two major producers, Viverno 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, Australian governments have recently 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 their domestic sugar industries. 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-added 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](https://www.reuters.com/business/healthcare-pharmaceuticals/britain-will-not-bail-out-bioethanol-industry-hit-by-trump-trade-deal-2025-08-15/), 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 have only been successful 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 order to build a domestic biofuels supply chain, the Brazilian Government implemented stringent ethanol mandates via the 1975 Proalcool Program, with ethanol fuel blend mandates ranging between 20-30%.

To maintain and grow this capability, the Government further established the RenovaBio 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 2025¹⁶. 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 fabrication¹⁸. 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 support 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.

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%20emissions%20steel%20in%20the%20future](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%20emissions%20steel%20in%20the%20future).

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):

- Energy transition and energy efficiency grants to paper milling²¹ 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 Boyer Paper Mill, 2025 Election Commitment Costing: <https://www.pbo.gov.au/elections/2025-general-election/2025-election-commitments-costings/Boyer%20Paper%20Mill>

²² Australian Federal Government: Department of Agriculture, Fisheries and Forestry – Accelerate Adoption of Wood Processing Innovation Program: <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 Australian Federal Government: Department of Agriculture, Fisheries and Forestry – Australian Forest and Wood Innovations: <https://www.agriculture.gov.au/agriculture-land/forestry/national/australian-forest-and-wood-innovations>

²⁴ Australian Federal Government: Department of Agriculture, Fisheries and Forestry – Support Plantation Establishment Program: <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 established 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 **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 for a scalable biofuels future. 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 utilisation 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 a holistic **sugar industry diversification strategy**, similar to the National and Queensland timber industry strategies.

Total cost of package: Approximately \$182 million over ten years

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 at a.salardini@sugarmanufacturers.org or on 0490 785 390.

Yours sincerely



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