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Sustainable Aviation Fuel Alliance of Australia and New Zealand & Cleaner Fuels Alliance
A Future Made in Australia: Unlocking Australia's low carbon liquid fuel opportunity

Bioenergy Australia (BA) is the national industry association committed to accelerating Australia's bio economy. Our mission is to foster the bioenergy sector to generate jobs, secure investment, maximise the value of local resources, minimise waste and environmental impact, and develop and promote national bioenergy expertise into international markets.

This submission from Bioenergy Australia is on behalf of the Sustainable Aviation Fuel Alliance of Australia and New Zealand (SAFAANZ) and the Cleaner Fuels Alliance (CFA). These alliances were founded to accelerate the development and deployment of Renewable Liquid Fuels including sustainable aviation fuel (SAF) and renewable diesel, as well as established biodiesel and ethanol fuels. Individual members of the alliances will be providing more detailed submissions specific to their business and expertise.

Australia's Bioenergy Roadmap (ARENA, November 2021) outlines how, by the start of the next decade, Australia's bioenergy sector could contribute around $10 billion in extra GDP per annum and 26,200 new jobs, reduce emissions by about 9 per cent, divert an extra 6 per cent of waste from landfill, and enhance fuel security. Now is the time to capitalise on these opportunities through the development of the A Future Made in Australia: Unlocking Australia's low carbon liquid fuel opportunity consultation.

We thank the Department for the opportunity to provide feedback on the A Future Made in Australia: Unlocking Australia's low carbon liquid fuel opportunity consultation paper. We recognise the Department has largely accepted our previous feedback and recommendations and we greatly appreciate the Department's continuous collaboration and communication with industry. We believe the level of engagement shown by the department to industry in unprecedented and commend the Government for its genuine commitment within this space.

Our response to the consultation paper has been informed by discussions held at a recent workshop attended by approximately 50 representatives from across the LCLF supply chain. This included feedstock providers, fuel producers, technology providers, offtakers, international stakeholders, industry associations, and government representatives.

A key theme from this workshop, and a top priority agreed upon across the industry, was the need for a suite of **both** supply-side and demand-side policy levers.

Demand-side levers alone will not enable the development of a sustainable and resilient domestic low carbon fuels sector. Driving demand through mandates or other demand side levers without ensuring adequate domestic supply will increase reliance on imported fuels, drive higher prices, and market

instability. It will also see Australia miss the opportunity of capitalising on the economic, jobs, fuel security of developing a domestic industry and will see Australia and our crucial sectors competing for low carbon fuels internationally. Supply-side support is crucial for standing up a domestic industry, driving the development of domestic feedstock supply, derisking long term investment, and supporting decarbonisation of crucial sectors of Australia's economy. Supply side support will increase production and reduce the impact on consumers and businesses as the cost curve for production reduces. However, without also demand-side measures, producers may hesitate to invest in new projects or maintain current production levels due to market uncertainty. Thus, it is crucial to design both supply-side and demand-side measures together to ensure they complement each other effectively.

Australia has significant potential to be a LCLF powerhouse but is in the early stages of domestic development. Implementing policies that do not adequately support domestic production and supply will force the industry to rely on imported fuels. This not only undermines our domestic fuel capabilities but also compromises our ability to meet domestic LCLF demand due to the high costs and international competition associated with importing these fuels, making it an unviable option for domestic businesses. In this scenario, Australia risks a situation where our domestic feedstock, which is abundantly available and grown on its own soil, will be exported, processed into LCLFs offshore, and then re-imported at significant cost for domestic use, sacrificing significant economic, environmental, and fuel security opportunities.

Section 1. The low carbon liquid fuels opportunity

What do you think are Australia's comparative advantages as an LCLF producer? Where does Australia face international competition?

Australia's comparative advantages as a LCLF producer include:

- **Feedstock:** Australia possesses a significant feedstock advantage with a diverse array of sustainable LCLF sources, including fats and oils (such as oilseeds, tallow, rendered animal fats, and used cooking oil) and lignocellulosic materials (like straw, cotton trash, sugarcane bagasse, forestry residues, urban waste streams, sugarcane, grasses, woody biomass, and algae). Australia's feedstock potential can effectively meet the increasing demand for LCLF production, while simultaneously sustaining agricultural supply for other purposes. Australia exports around 72 per cent of the total value of its agricultural, fisheries and forestry production[1] while already producing enough food for 60 million people annually and enough cotton to clothe 500 million.[2] Australia's feedstock potential was also highlighted in the 2023 CSIRO SAF Roadmap. This report projected that in 2025, Australia will have enough feedstocks to produce 60% of local jet fuel demand using biogenic feedstocks, growing to 90% by 2050. It is suggested that as of today, there is sufficient feedstock to supply approximately 5 billion litres of SAF production Australia. [3]

[1] Snapshot of Australian Agriculture 2023 - DAFF
[2] Australia's Chief Scientist, Australia 2025: Smart Science, 'Agriculture in Australia: growing more than our farming future').
[3] CSIRO Sustainable Aviation Fuel Roadmap (2023)

- High functioning Agriculture sector with high sustainability principals recognised internationally - Australia has the natural resources and an agricultural sector with the capabilities and sustainability to meet the growing demand for renewable feedstocks to be used to create this energy, while minimising or avoiding land use change. There are emerging solutions and innovations in agriculture that will enable Australian farmers to meet the rapidly rising demand for these renewable feedstocks while improving their productivity and sustainability. The ability to also develop high quality and harmonised sustainability standards will also enable feedstock production that supports and maintains Australia's food, fibre, and fuel security.
- Existing infrastructure: Australia has an existing robust infrastructure base that can be leveraged for widespread LCLF production and distribution.
- Highly skilled workforce and R&D/university sector: Australia benefits from a highly skilled workforce, particularly within its agriculture sector and R&D/university sector, providing expertise and innovation to advance technologies and sustainable practices that harness Australia's natural advantages in LCLF production and distribution.
- Existing LCLF supply underutilised: Existing biofuel supplies in Australia (biodiesel and ethanol) are currently underutilised, presenting an immediate opportunity for increased production.
- Strategic geographical location for supply into the region: Australia's geographic location provides access to key export markets in Asia and the Pacific region making it a demand centre for international carriers. With its prime feedstock position, agricultural capabilities, refining potential, renowned ingenuity, and an array of stakeholders across the entire value chain who are ready to act, Australia could be a key leader in supplying LCLFs across the Asia-Pacific. Thus, a domestic LCLF industry not only strengthens national fuel security and energy independence by reducing our reliance on imports—currently accounting for 90% of Australia's liquid fuels—but also supports regional energy security initiatives.
- Industry alignment - Australia has an array of stakeholders across the entire LCLF value chain who are ready to act and progress development of a local LCLF industry. There is a unified level of support across feedstock suppliers, fuel producers, infrastructure owners and fuel reliant industry providing a low-risk political environment in supporting the industry.
- Capitalise on international learnings and develop a domestic industry with social license and sustainability at its core - Although Australia lags behind its global peers in developing a LCLF industry, it has a unique opportunity to benefit from the experiences of nations that have already made strides in this area. By learning from international examples, successes and challenges, we can develop a more effective policy framework that maximizes our inherent advantages while also ensuring we develop this industry in a manner that preserves social licence.

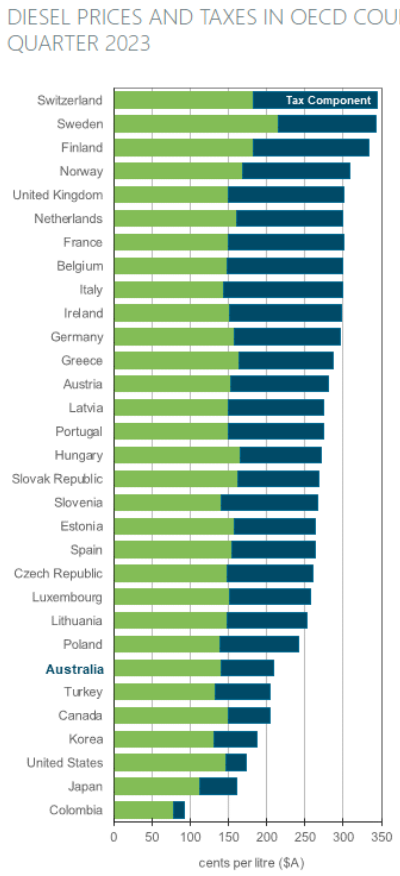
There is already an established and growing global LCLF market and Australian LCLF producers will compete for capital, feedstocks, and market demand with producers from other countries.

In the European Union alone there are over 30 advanced biorefinery projects in operation, and a further 10 are slated for operation before 2025; several are developing SAFs and renewable diesel

production capabilities.[4] In 2022, about 18.7 billion gallons of biofuels were produced in the United States and about 17.6 billion gallons were consumed.[5] Renewable liquid fuel demand is set to expand 38 billion litres over 2023-2028, a near 30% increase from the last five-year period.[6]

While governments and industry across Europe, the United States, the United Kingdom, Singapore, Japan and Canada progress policy to accelerate the adoption of LCLFs signalling to the market through ambitious targets, through fuel subsidies, blending mandates, low carbon fuel standards, capital grants and loans, and funding for individual projects, Australia remains at first base, beholden to international competitors and inflated prices that are ultimately borne by the consumer. These international incentives make it challenging for Australia to compete for production investment, despite the potential to produce some LCLFs more cost effectively than in overseas markets. Without prompt and effective policy action, Australia will fall further behind international competitors, leading to more of its feedstock exported to support overseas LCLF industries and leaving its domestic industries at the mercy of international supply availability and market pricing. The chart below from the Australian Institute of Petroleum, shows the price of diesel in Australia compared to other countries on both a pre-tax and post-tax basis.[7]

AIP: International Price Comparisons



[4] IEA, 'World Energy Investment 2023' (2023)

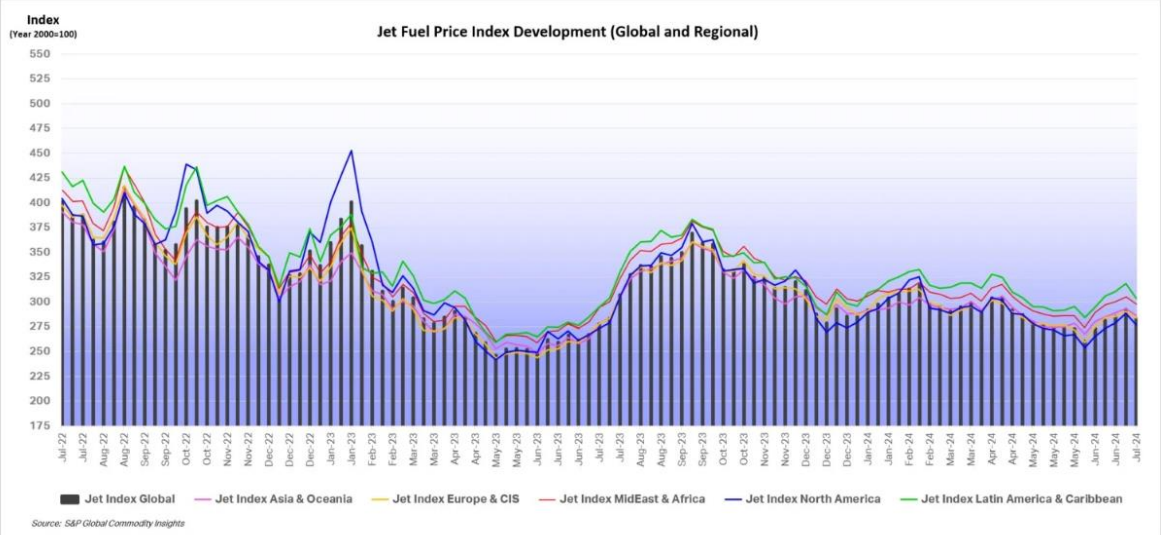
[5] US Department of Energy, '2023 Billion-Ton Report: An Assessment of U.S. Renewable Carbon Resources (2024)

[6] International Energy Agency (IEA), Renewables 2023, (2024)

[7] Australian Institute of Petroleum 'International Price Comparisons'

The below graph from IATA's Jet Fuel Price Monitor provides price data sourced from energy information provider Platts. The Jet Fuel Price Index and price data show the average prices paid at the refinery for aviation jet fuel for the reported week.[8]

IATA: Jet Fuel Price Monitor



Without policy support, Australia's feedstock is also at risk of being locked into long-term offtake agreements, where Australian feedstock is exported to foreign refiners, ultimately sending millions of dollars overseas. As a result, Australia risks becoming a net importer of renewable fuels derived from feedstock abundantly available on its own soil. This is a real and immediate threat with Australian LCLF feedstocks already being exporting, notably:

- Approximately, two-thirds of Australia's canola oilseed exports are to the EU, largely for biodiesel production, thanks to the incentives for bioenergy production and use in the EU.[9]
- There has been over a 30,000 per cent increase in the export of used cooking oil from Australia to the US from 2020 to 2022, largely due to the LCLF incentives in the US.
- Australia's largest market for tallow is in Singapore, with over 223,000t of tallow exported in 2021/22 for biofuel production.[10]
- As of 2021/22, around 156,000t of Australian tallow is exported to the US, up from 7,500t five years previously. This recent growth could continue with the Inflation Reduction Act 2022 including numerous incentives for SAF production, such as a US$1.25/gal blending credit which aim to meet the annual domestic production goal of 3 billion gallons.[11]
- Australia exports 85 per cent of the ~4m tonnes of sugar produced annually from the 30 m tonnes of cane produced, making Australia the world's second largest exporter of sugar after Brazil. This sugar could be diverted to make ethanol or SAF, as could the >10m tonnes of dry residual material.[12]

[8] IATA: Jet Fuel Price Monitor
[9] United States Department of Agriculture: Foreign Agricultural Service, 'Biofuels Annual' December 2022
[10] CSIRO Sustainable Aviation Fuel Roadmap (2023)
[11] Ibid.
[12] AgriFutures, 'Australian Biomass for Bioenergy Assessment 2015-2021' (2021)

- Australia is already exporting around 72 per cent of the total value of its agricultural, fisheries and forestry production.[13]

Without policy support that incentivises domestic production, more feedstock will be locked into export agreements, forcing local suppliers to compete for it, and reducing availability for domestic use.

Based on the current policy and market environment, to what extent will Australia rely on imports of LCLF, as opposed to domestic production?

Renewable liquid fuel demand is set to expand 38 billion litres over 2023-2028, a near 30% increase from the last five-year period.[14] However, international investment is focussed in jurisdictions where governments are actively accelerating the adoption of renewable fuels through ambitious targets, subsidies, blending mandates, low-carbon fuel standards, and funding for projects. Thus, to attract this global investment to support domestic LCLF production and project development, Australia requires the right policy settings.

To de-risk investment for local LCLF production facilitates, the following risks must be assessed:

- Technology risks
    - Technology readiness
    - Need for innovation and demonstration before it's ready for commercial deployment (all technology but HEFA).
    - Risk that plant will not operate as expected
- Construction risks
    - Risk of delay or cost blowouts
    - This occurs due to ground conditions, interface between different parts/modules, and underestimation of time/cost to build and commission
- Feedstock risks
    - Competition for resources that can be used as feedstock
    - Risk that producers will not attract sufficient feedstocks to maintain forecasted production levels and cash flows
- Revenue certainty
    - Uncertainty around future pricing for LCLFs.
    - Determining whether a green premium eventuate.
    - What will be the future carbon costs for alternatives?

Without the above risks being addressed, development of a domestic LCLF industry is challenging. Accordingly, Australia does not currently produce any SAF or renewable diesel domestically and is reliant on imports (largely made from Australian feedstock). However, importing these fuels is cost-prohibitive compared to traditional fuel equivalents, rendering widespread adoption economically unfeasible beyond limited demonstration projects.

[13] Snapshot of Australian Agriculture 2023 - DAFF

[14] International Energy Agency (IEA), Renewables 2023, (2024)

However, it should be recognised that Australia has an existing ethanol and biodiesel industry that can support immediate decarbonisation of key sectors.

In 2022, Australia's three biodiesel refineries produced 15 million litres of biodiesel, with the industry capable of producing at least 100 million litres annually. [15] Biodiesel technology is mature and ready for widespread adoption, with various production methods optimized for efficiency and compatibility with existing infrastructure and vehicles. Biodiesel is already used as a drop-in fuel in the maritime, shipping, mining, and construction sectors, fully compatible with these applications. Local biodiesel production can also support Scope 3 emission reductions by processing local feedstock for domestic supply, thereby avoiding emissions associated with exporting and importing.

Australia's ethanol refineries produced approximately 175 million litres of ethanol in 2022 but has the capacity to produce 440 million litres annually. Australian ethanol could be utilised as an essential feedstock to produce SAF through the alcohol to jet pathway. This pathway not only offers LCLF producers a readily available and economically viable feedstock but also creates a new revenue stream for ethanol producers seeking to diversify and meet the demands of a rapidly expanding aviation market. This expansion will strengthen domestic production capabilities and increase supply to meet the growing demand for LCLFs. However, the underutilisation of these industries can be attributed to a lack of government support and ineffective state policies (e.g., QLD Biofuels Mandate).

There is a clear need and opportunity for the Government to support our existing and operational domestic production capabilities.

Section 2. Options for a production incentive scheme

What mechanism do you think would best support production – through the tax system, contract for difference or grant based funding?

Determining which production incentive mechanism is most suitable highly depends on the strategic outcomes that the government aims to achieve.

Capital and development grants: This support is critical for early-stage industry development by enabling the standing up of new LCLF projects/facilities. This mechanism can support the following outcomes:

- Kickstarting Australian domestic refining capabilities.
- Generating jobs in project development and construction.
- Establishing domestic production to strengthen domestic fuel security
- Can have an immediate impact.

Limitations

- Will not support domestic decarbonisation unless coupled with other measures as fuel will naturally move to markets with supply and demand side policies reducing the cost premium.
- Will not have a sustained long-term impact on developing a domestic industry

[15] Report: Biofuel Consumption In Australia Remains Minimal In 2022 (2023)

Production credits/production tax incentives: This type of support is critical for the initial development of domestic LCLF production. These mechanisms can support the following outcomes:

- Maximising the development of a competitive marketplace through not "picking a few winners"
- Can be designed to maximise emission reductions when tied to carbon intensity.
- Can support the utilisation of existing LCLF production facilities (particularly biodiesel for marine decarbonisation)
- De-risk long-term investment (10-15 years) to ensure continuous production.
- Less complex enabling quick implementation.

Limitations

- If incorrectly designed, can prioritise existing technologies and pathways, limiting technology and feedstock innovation and development.

Contract for Difference (CfD): This support can be effective in addressing the revenue risks associated with emerging technologies as they provide revenue certainty. This mechanism can support the following outcomes:

- Diversifying Australia's fuel mix.
- Can be leveraged to drive the development of new technologies, pathways and feedstocks, leading to growth and diversification in LCLF production.
- Innovation and job creation in new technology areas.
- Development of technologies with higher emission reduction potential, thereby enhancing decarbonisation efforts.
- Encouraging offtake agreements to ensure steady market uptake.

We recommend a combination of these production incentive mechanisms to achieve the Government's strategic outcomes.

More information on the proposed mechanism's pros, cons, international examples as well as key design considerations are provided:

Contracts for Difference (CfD):

Pros:

- Certainty mechanism: A CfD manages revenue certainty risks
- Gradual adjustment: CfD instruments can be applied on a sliding scale over time, gradually reducing coverage. For instance, covering 100% of the cost premium in the first year and reducing year-on-year over a decade, allowing customer willingness to pay to increase gradually.
- Price floors: Provides price floors, ensuring producers are shielded from volatile market prices, crucial for financial stability.
- Bridging cost gap: CfD bridges the production cost premium relative to conventional jet fuel for a fixed period, supporting commercial-scale facilities to achieve cost-competitive production in Australia.

- Investor attractiveness: By guaranteeing a price and shifting project risk, CfDs enhance project attractiveness to investors, facilitating bankable finance.
- Exit strategy: CfDs can be designed with specific timelines and exit strategies, ensuring clarity and manageability for both government and producers.

Cons:

- Government financial exposure: CfD's expose governments to financial liabilities if market conditions or project outcomes deviate from expectations.
- Dependency on Government support: Success of CfD's hinges on sustained government funding and policy support, which may fluctuate, impacting long-term project viability.
- Uncertainty Over Time: Over time, CfD's may create uncertainty regarding continued government support, especially with changes in political leadership or shifts in policy priorities.
- High complexity to administer

International example of CfD: The first use of a CfD policy to support sustainable projects was the low-carbon electricity CfD policy implemented in the UK in 2014. This mechanism has been particularly effective in terms of its impact on offshore wind with 13 GW of projects in the four rounds carried out to date and with prices falling from US$164.59/MWh to US$46.61/MWh[16]. A CfD-style 'Guaranteed Strike Price' instrument is now being contemplated by the UK government alongside their SAF Mandate to support the scaling of a domestic SAF industry.[17]

Key design considerations:

- Scale, noting that impact would likely require a $A2B Hydrogen Headstart -sized intervention.
- Price discovery (establishing reference prices accepted by the market).
- Price reductions over time in line with SAF costs decreasing.
- Consideration on how to administer such as a competitive auction process.
- Consideration on the need for different strike price for different carbon intensities

Fixed grants:

Pros:

- Government manageability: Grants can be more straight forward to implement.
- Certainty: Fixed grants provide clear and predictable support terms, which helps recipients understand the amount of support they expect to receive.
- Supports projects: Can aid producers to reach financial close on projects, accelerating project construction and reaching commercial readiness.
- Supports emerging technologies: Assist in the deployment and market entry of new projects, fostering competition in the industry.
- Development grants: provide crucial financial support during critical phases, helping projects overcome funding gaps and reducing the risk of failure.

Cons:

- Lack of flexibility: Fixed grants do not offer the same flexibility as other mechanisms, as they are not responsive to changing dynamics and therefore do not address construction risk.

[16] Deloitte, 'The Transitioning Australia's Liquid Fuel Sector: The Role of Renewable Fuels Report' (May 2023)
[17] Clean Air Force Task, 'A solutions-based approach to the UK's net-zero transition' (March 2024)

International examples of grants:

- US Biofuels Production Grants provides US$500 million fund available for biofuel infrastructure and agriculture product market expansion.[18]
- US Low-Emission Aviation Grants: US$297 million fund available for alternative fuels and low emission technology within the aviation sector.[19]
- Japan's state-owned New Energy and Industrial Technology Development Organization has awarded a total of Yen 114.5 billion ($893.6 million) grants to pilot projects developing e-fuel, sustainable aviation fuel and other green innovation technologies. This support is intended to encourage supply development in advance of their upcoming mandate.[20]

Key considerations during the design process would include:

- Size of the funding pool
- Conditionalities for funding (sustainability criteria, knowledge sharing etc)
- the effectiveness of grants varies by technology pathway and facilities size (e.g. pilots and demonstrators compared to commercial scale facilities).
- Provision of both capital and development grants

Production credits/production tax incentives

Pros:

- Can quickly attract new investment and lower production cost.
- Predictable payment: Provides an agreed amount per volume over the production period, ensuring revenue stability and predictability for producers planning long-term investments.
- Addresses price premiums: addresses cost differences between renewable and fossil fuels, making LCLFs more competitive in the market.
- Clear exit strategy: the defined period for incentives provides certainty and allows producers to plan their operations and investments effectively, ensuring a stable transition as policies evolve.
- Simplifies participation by offering straightforward eligibility criteria, making it accessible to a wide range of producers without competitive bidding.
- Uncapped potential with time limit: Allows producers to benefit from an uncapped amount of credits within a specified time frame, supporting scalability while managing fiscal exposure for the government.
- Medium complexity to administer

Cons:

- Revenue certainty: revenue certainty is addressed to an extent but not as much CfD.

International example:

- Renewable fuel tax credits have received broad community and industry support in the US. The Biodiesel Tax Credits (part of Inflation Reduction Act): Tax credits from US$1.00 - US$1.75

[18] Deloitte, 'The Transitioning Australia's Liquid Fuel Sector: The Role of Renewable Fuels Report' (May 2023)
[19] Ibid
[20] https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/041922-japan-awards-yen-1145-bil-grants-for-e-fuel-saf-and-other-green-technologies

per gallon incentivising the adoption of biodiesel, renewable diesel and alternative fuels, inclusive of second-generation biofuels. Fuel must meet certain emissions standards. Credit-per-gallon base amounts are $0.20 (non-aviation fuel) and $0.35 (aviation fuel). Increases in credit amount to $1.00 per gallon (non-aviation fuel) and $1.75 per gallon (aviation fuel) if wage and apprenticeship requirements are met. Under the credit, the lower a fuel's carbon intensity score, the higher the potential credit.[21] The uptake effect from tax crediting systems in the US, while inexact, has led to a large uptake of renewable fuels with an increase of 4 billion to 17 billion gallons of ethanol and 100 million gallons to 2 billion gallons of biodiesel.[22]

- US Sustainable Aviation Fuel (SAF) Tax Credit: Producers of SAF are eligible for a tax credit of $1.25 per gallon. Qualifying SAF must reduce greenhouse gas (GHG) emissions by 50%. SAF that decreases GHG emissions by more than 50% is eligible for an additional $0.01 per gallon for each percent the reduction exceeds 50%, up to $0.50 per gallon.[23]
- US Clean Fuel Production Credit: Beginning January 1, 2025, the US Treasury Department will offer tax credits for the production and sale of low emission transportation fuels, including SAF. The tax credit amount is $0.20 per gallon for non-aviation fuel and $0.35 per gallon for SAF[24]
- Japan is considering implementing a tax credit of 30 yen/litre for SAF.[25]

Key design considerations:

- Emissions intensity of each fuel type to incentivise maximum impact.
- Determining whether tax credits are variable within a defined range depending upon the emissions intensity of each fuel type to incentivise maximum impact.
- To be eligible for the additional tax incentive, a lifecycle assessment would need to be conducted for the eligible LCLFs to understand the total emission reductions, promoting greater transparency.
- Defining the program period (e.g. first 10 years of operation).
- Setting the total payment cap.

Are there other mechanisms Government could consider to deliver production support, other than a production tax incentive or competitive grant-based payment? What do you think is the highest priority form of support?

To enable the development of a domestic industry the government will need to provide clear signals to industry. This includes funding commitments, enabling policy and clear timeframes for implementation. These commitments can ensure that projects can develop now while providing confidence to producers and investors of future support.

Regarding prioritisation of policy and funding commitments and their impact we have highlighted below:

[21] Deloitte, 'The Transitioning Australia's Liquid Fuel Sector: The Role of Renewable Fuels Report' (May 2023)
[22] Ibid, page 24.
[23] https://afdc.energy.gov/laws/13160.
[24] Alternative Fuels Data Center: Clean Fuel Production Credit (energy.gov)
[25] JAPAN'S GREEN TRANSFORMATION (GX) PLANS - Updates (Jan 2024)

- There is the immediate opportunity for standing up a new LCLF industry and driving the development of new projects. Capital and development grant support to enable standing up projects and removing key barriers for deployment is an immediate opportunity. Whilst this will not enable domestic offtake, cost reduction and reducing domestic emissions it will drive projects to begin while policy work can be done in other areas. This support can also complement other production mechanisms to aid in the ongoing expansion of local projects/production.
- Production Tax incentives – to support the longer-term de-risking of projects
- Regulated demand levers – A clear signal to industry will need to be made. It is understood the design of this will take some time, however announcing a clear intention, start date and percentage or approach is crucial.

These mechanisms can be developed and implemented in a combination approach.

What are expected production costs of LCLF in Australia?

The expected production costs of LCLFs in Australia will be influenced by several factors:

- Feedstock: Type, costs and availability
- Technology types: Initial capital investments in production facilities, ongoing operational costs and technology maturity.
- Capital costs: Each plant will have distinct capital costs based on factors such as the production pathway, the cost of capital available, local construction expenses, and specific regulatory requirements.
- Operating costs: Based on specific plant design and efficiency, operational flexibility, energy costs, labour costs, material costs etc
- Local economic conditions: Market demand for LCLFs can influence production costs.
- Scale of production: Larger production scales generally benefit from economies of scale, reducing per-unit production costs. As production volumes increase and technologies mature, efficiencies in manufacturing and logistics can drive down costs.
- Research and development: Investments in R&D to improve production processes, increase feedstock efficiency, and develop new technologies can impact long-term production costs by lowering technological risks and enhancing efficiency.
- Supply chain integration: Integration with existing feedstock suppliers, logistics networks, and end-users (such as airlines) can affect costs through supply chain efficiencies and strategic partnerships.
- Comparison between LCLFs v traditional fuels: This comparison highlights the cost competitiveness of LCLFs relative to fossil fuels, which is key for assessing economic viability.
- Sustainability standards: Compliance costs and market access.
- Type of policy support: Government incentives, subsidies, taxes, and regulations.
- Policy dynamics: Recognising the cost differences between different fuels and ensuring that policy measures do not inadvertently create a market that favours one fuel type over another (e.g., renewable diesel vs SAF).

The **Developing a SAF industry to decarbonise Australian aviation Report,** provides a more detailed analysis on these factors and how they could impact Australian SAF production costs.[26]

The Report states that Australian SAF production costs reductions could be achievable throughout 2024-2040, driven by better financing (in the short-term) as technical risks are reduced, and reduced capital costs (mid/long term) as each technology progresses down the learning curve. Feedstock costs will fluctuate to reflect supply chain improvements (reducing costs) against increased demand (increasing costs). As these factors vary by deployed capacity, the future costs vary with the policies and scenarios assessed. However, it notes that there is more opportunity for the (currently more costly) solid biomass SAF pathways to reduce in price, as the technologies are still at relatively early stages of development, and later facilities will benefit from scale, technology improvements, and other learning effects.[27]

The Report also highlights that different sustainability criteria can influence the cost of production and the level of incentives required to create a viable market. For example, in the US, SAF can be produced from a broad range of feedstocks and many producers use a blend of wastes, such as UCO (which are scarce but lower emissions) and virgin oils, such as soybean oil (which are more plentiful but have higher emissions). In the EU, only waste and residues can be used, which constrains the market and increases the cost of production. The UK is focusing on waste feedstocks, plus a cap on the use of HEFA, which will further increase production costs but focus on lower-emission technologies.[28]

With respect to current production capabilities, biodiesel emerges a cost-effective option, priced at $2.00/litre[29], in comparison to renewable diesel at $4.00-5.00/litre. Mineral diesel is priced at $1.60/ litre. Targeted production support could further reduce costs, enabling greater access to a domestically produced and readily available LCLF product.

How would you design production incentives to make production competitive in Australia?

To enhance Australia's production competitiveness, we support a combination or "stackable" policy approach. It is crucial that this includes demand and supply side support.

The success of "stackable" LCLF policies has been demonstrated in the US, where incentives such as the Blenders' Tax Credit (similar to the proposed production tax incentives), the Renewable Fuel Standard (RFS) (as a demand side policy) at the national level, and state-level low-carbon fuel standards (LCFS) (also driving demand) like California's, contribute significantly to the cost competitiveness of LCLF products. These incentives and demand levers in consultation, when stacked further enhances the financial attractiveness of LCLF production, de-risks investment reduces the cost premium for consumers.

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[26] Qantas & Airbus, ICF Report, 'Developing a SAF industry to decarbonise Australian aviation' (November 2023).
[27] Ibid
[28] Ibid
[29] https://www.nsenergybusiness.com/analysis/how-mining-companies-can-embrace-sustainable-fuels-to-cut-emissions/

By adopting a similar approach, Australia can drive the development of a domestic industry, enable utilisation of domestic feedstock, enable domestic offtake and maximise emissions reduction.

What would an expected rate of support be under a competitive grant-based production scheme (contract for difference or fixed grant amount per production unit)?

When considering the rate of support, there are two different cost gaps to address:

1. LCLFs vs Fossil Fuel
    - For example: SAF to Jet+ACCU (approx. USD$2500-$4500/ tonne for SAF to USD$700/tonne for jet)
        - The lower SAF value being typical HEFA pricing the higher being novel technologies including ATJ, 2nd gen SAF
        - This bridge is understandably expensive and is necessary where there is no other encouragement for SAF
2. AUS LCLF to International LCLF
    - For example: AUS SAF to International SAF (USD$2500-$4500/tonne for domestic SAF to USD$2000/tonne international HEFA SAF price (unsubsidised))
        - This is the bridge where the alternative to SAF is not jet, rather the alternative is SAF from elsewhere i.e. where there is a mandate.

Given that Australian investments will need to compete with international options, domestic production schemes should aim to make investing in local production more attractive. The Government should consider the incentives provided to producers in other jurisdictions, and the potential to reduce market risk through demand mechanisms, to determine an appropriate rate of support that will keep Australian production competitive.

The Government should also consider how the following factors may impact the rate of support required:

- Other policy support – the Safeguard Mechanism and demand side levers (mandates or a LCFS) would reduce the financial gap.
- Any changes to the way fossil fuel liquid fuels are taxed or treated from a carbon perspective would likely reduce the cost difference between fossil fuels and LCLFs (as costs for the fossil equivalent would likely increase).
- The different production technologies being pursued, the different products and the different return on capital hurdles noting that risk is a key driver of the latter and could be reduced through government intervention which lowers commercial, market or technical risk.
- International demand and incentives which may be available to Australian producers for export of their product. Noting that there may be a need for the government to support bilateral SAF agreements with key markets including the EU, Japan, US.
- If Australian producers must sell LCLFs domestically to receive the production incentive, the ability to cover over the gap between the willingness to pay for the LCLF in Australia and the price the producer could receive in the international market.
- The high volatility of the fuel market.

How many producers would you expect a production incentive scheme to support in Australia?

Based on industry advice it would be expected that 3-4 significant projects (500ML/year) and 5-8 smaller projects (100ML/year) would progress between now and 2030, if favourable market conditions were present. In addition, a production incentive scheme could support the existing

production and domestic supply of biodiesel for maritime, shipping, mining and construction applications from Australia's three biodiesel refineries.

How could the introduction of a production incentive scheme affect competition in fuel production and supply markets, and also amongst fuel users?

We support a production incentive scheme design that enables the following:

- **Decarbonisation of hard to abate sectors is prioritised:** Hard to abate sectors such as aviation, transport, mining, construction, shipping and rail have limited decarbonisation options with LCLFs emerging as a key solution, especially throughout the short to medium term. Without these fuels reducing emissions within these sectors, Australia will be unlikely to meet net zero objectives. This prioritisation enhances competition by encouraging innovation and investment in technologies that can effectively decarbonize these sectors.
- **Large scale facilities and new entrants are supported through a scheme to ensure competition**: The scheme should support the establishment of large-scale production facilities and facilitates entry for new producers. This support fosters competition by enabling more players to participate in the market, thereby promoting innovation, improving economies of scale, and driving down production costs.
- **Policy does not just prioritise lowest cost abatement, but recognises various technologies, feedstocks and pathways:** By recognizing, incentivizing and encouraging a diverse approach the scheme should enable existing technologies to deploy immediately whilst enabling the development of higher risk and more costly feedstocks and pathways to be incentivised.
- **Policy aligns to a broader strategic approach, enhancing domestic fuel security and a diversified fuel production approach:** The policy should align with a broader strategic approach of enhancing domestic fuel security and promoting diversified fuel production domestically. With fuel security as a critical risk, it is essential that supply side support is enabled. By integrating these goals, the scheme supports resilience in fuel supply chains, reduces dependence on imported fuels (where 90% of liquid fuels are presently sourced for Australia[30]) and contributes to national energy security.
- **Incentivises fuel switching:** Developing a domestic LCLF industry will drive competitive pricing and enhance availability of LCLFs incentivise fuel users to switch from conventional fuels and embed LCLF as a key contributor to our domestic fuel industry. Creating competition encourages consumers to adopt cleaner and cost-effective alternatives to meet their energy needs.
- **Sustainability benefits**: Production incentives that promote LCLFs also address fuel users' sustainability goals. Reduced emissions from using LCLFs align with environmental regulations and targets, influencing fuel users to adopt cleaner fuel options to enhance their competitive position in terms of environmental compliance.

[30] CSIRO Sustainable Aviation Fuel Roadmap (2023)

What are the expected timeframes for when an industry would be sustainable without support from Government?

Foremost, the cost curve for producing LCLFs will vary depending on the fuel type, technology, feedstock and government appetite for driving for the development of the industry. Additionally, in a climate constrained environment, there needs to be an expectation that there will ultimately be a carbon price applied to those products that are enabling our decarbonisation. Therefore, Government support for the development of this sector should not be limited to immediate emissions reduction, but should take a holistic and strategic view of the sector and the benefits it will provide, including:

- Fuel security
- Regional economic development and jobs
- Diversified and enhanced revenue streams for Australia's agriculture sector
- Global interoperability for aviation, marine, tourism and defence industries
- Enabling the cost-effective and accessible decarbonisation option for significant sectors of Australia's economy including aviation, marine, rail, heavy haulage, construction and agriculture.

How should production support be funded, and how could this best be aligned with the beneficiaries of the production support?

It is essential that government recognises and values the essential role of LCLF if decarbonisation of not only our hard to abate sectors, but also crucial sectors identified as growth opportunities in Australia's economy as the energy transition accelerates. A domestic LCLFs industry benefits a wide range of stakeholders, including feedstock providers, construction workers, and those involved in production and distribution, while also providing flow-on benefits to local communities and offering fuel users across the economy lower-cost abatement options and enhanced fuel security. The development of this industry should be considered as a strategic objective within government to ensure we are globally competitive, meeting our global commitments, enhancing our energy security and enabling the products and services we deliver are supported by emission reducing options.

Government will need to recognise not only the emission reduction potential, but value and recognise the essential contribution of these industries to our economy and enable a pathway for support. Government financial support should be considered in the wider framework of the additional long-term benefits being delivered.

Private investment is also crucial for supporting production and demonstrating feasibility, as demonstrated by recent commitments:

- Qantas and Airbus committed a joint US$200m fund to invest in locally developed and produced SAF and feedstock initiatives to accelerate SAF in Australia.
- GrainCorp and IFM Investors have agreed to undertake a feasibility study to explore the potential of establishing SAF production facilities around Australia. The study will examine the use of agricultural feedstocks to produce SAF, which will then contribute to the decarbonisation of the industry.
- Cleanaway have launched their HVO100 demonstration, with two vehicles to be powered by Neste's 'Neste MY Renewable Diesel', HVO100, made exclusively from used cooking oil and that reduces greenhouse gas (GHG) emissions by 91 per cent.

- Ampol has committed to a renewable diesel trial with Hanson, as their first customer partner. This trial will feature a blend comprising 20 per cent renewable diesel and 80 per cent ultra-low sulphur diesel, along with Ampol's Amplify additives.
- In Australia, approx. 162,000L of renewable diesel (HVO) has been used by Australian construction companies, including Lendlease construction of NSW Government Powerhouse Parramatta and the Queensland New Performing Arts Venue.[31]
- bp and BHP have collaborated on a trial to power haul trucks and other mining equipment at their Yandi iron ore operations in Western Australia using renewable diesel.
- Wilmar Sugar and Renewables, Australia and New Zealand's largest manufacturer and marketer of raw and refined sugar products, has swapped conventional diesel for renewable diesel in a landmark trial aimed at reducing greenhouse gas emissions in its locomotive fleet.[32]
- For example, Murrays Coaches' 2022 trials showed that B100 biofuel maintained similar power and fuel efficiency while reducing CO2 emissions by 80% or more. This success led to their order of five new Scania biodiesel coaches for Queensland.[33]
- In 2023 Queensland company EcoTech Biodiesel provided biodiesel as part of the ANL, Woolworths Group, the Port of Brisbane, bp Marine and EcoTech collaboration to undertake a 42-day trial voyage between South East Asia and Australia powered by locally produced biodiesel. For this trial, the container ship was powered by 500 metric tonnes of biofuel made up of bp Marine's Very Low Sulphur Fuel Oil blended with a biodiesel produced by Brisbane-based company EcoTech Biodiesel from recycled cooking oils, fats and grease. Preliminary data showed the voyage could reduce emissions by approximately 17% as well as reducing nitrous oxides and sulphur oxides (air and marine pollutants).[34]
- In May 2022, Rio Tinto announced a partnership with BP in which they trialled a biodiesel blend to power its marine fleet for 12 months. Using a combination of biodiesel and very low sulphur fuel oil, it was estimated that this blend could reduce emissions by 26% in comparison with standard marine fuel oil.[35]

Section 3. Design of production incentives

Would production support need to offer a different rate of incentive for SAF and renewable diesel?

Australia's demand for liquid fuel has steadily grown since 2002/03, reaching 54,000 ML in the 2019/20 fiscal year, representing 45 per cent of the country's total energy consumption across industry, households, and government.[36] This growth has been driven primarily by increasing demand in key sectors such as mining, construction, aviation, rail, passenger, heavy vehicles and regional energy supply highlighting significant ongoing demand for liquid fuels in Australia.

[31] ACA & Lendlease, 'Renewable fuel use in construction: latest changes & developments', presentation apart of Decarbonising diesel-reliant industries at Australian Renewable Fuels Week (19 March 2024)
[32] Wilmar Sugar and Renewables, Media release: Trialling Renewable Diesel (2023)
[33] https://www.scania.com/au/en/home/about-scania/newsroom/news/.
[34] Queensland Government, 'Queensland welcomes home successful biofuel shipping trial'
[35] Rio Tinto and bp sign one-year trial of marine biofuels
[36] Deloitte, 'The Transitioning Australia's Liquid Fuel Sector: The Role of Renewable Fuels Report' (May 2023)

New production capacity could be used to produce either renewable diesel or for SAF, with some refineries having more flexibility than others to shift between the two LCLFs.

However, a production incentive or demand-side measure designed neutrally for LCLFs would likely favour biodiesel and renewable diesel due to its lower production costs and place SAF at a disadvantage. It is important to recognise that in the long-term, electrification may become feasible for some diesel-reliant technologies, however SAF will be required in aviation past 2050 as there is currently no viable alternative to decarbonise.

Thus, policy needs to ensure both sectors can access LCLFs to decarbonise their sectors and policy design enables and encourages the acceleration and deployment of multiple fuel types to support decarbonisation of key sectors with a recognition that not all fuels are equal in cost and demand.

Would a potential production support program need to prescribe certain proportions of production volumes towards SAF or renewable diesel?

We caution the government against measures that could potentially distort market dynamics, but recognise as mentioned above not all fuel types are equal and policy design will be crucial. Production support programs should allow producers the flexibility to respond to market conditions, meet demand, and optimize their production strategies, whilst enabling technology acceleration accordingly. This approach fosters sustainable growth and enhances competitiveness across different segments of the fuel market.

Would production support need to provide different levels of support for emerging and established production pathways? What are some of the design considerations Government should consider?

Approximately 85% of SAF facilities expected to come online in the next five years will utilise HEFA production technology, relying on inedible animal fats (tallow), used cooking oil, and industrial grease as feedstocks.[37] HEFA is presently the most mature and investment-ready pathway for renewable diesel and SAF production using oil-based feedstocks. HEFA is the lowest cost and most mature technology pathway.[38]

However, the HEFA pathway is limited there is a significant imperative to diversify and scale up LCLF production through a range of technologies and feedstocks to meet growing demand. This includes expanding production through emerging technologies such as Alcohol-to-Jet (AtJ), which uses ethanol or butanol fuels, and Fischer-Tropsch (FT), which utilises bio/agricultural wastes and residues. Looking further ahead, Power-to-Liquid (PtL) technologies, which produce liquid hydrocarbons synthetically using renewable electricity, water, and carbon dioxide (CO_2), will also contribute to expanding capacity.

The choice of technology and feedstock is heavily influenced by local availability and supply chain costs. Therefore, government plays an important role in steering the development of the industry to develop technologies and facilities that are most suitable for the long-term development of an LCLF industry in Australia. Emerging technologies are essential to the long-term development of an Australian industry, yet their low technology maturity results in a much higher price than other

[37] IATA, 'SAF Volumes Growing but Still Missing Opportunities' (2023)
[38] 'Analysis of the Potential of Meeting the EU's Sustainable Aviation Fuel Targets in 2030 and 2050' (2023)

approaches. If early emerging technology facilities are not supported, then early producers may hold-back as the technology cannot compete, and Australia will be forced to rely on imports once the availability of HEFA feedstocks becomes constrained.

To maximise the immediate potential of LCLFs, it is crucial for governments to fully leverage HEFA's technological and commercial readiness. At the same time, it is essential to support and recognise in policy design emerging technologies to ensure continued future production growth.

Therefore, a combination of mechanisms that support established pathways, as well as those that specifically de-risk emerging technology, could be effective to maximising domestic production capabilities.

What policy approaches are technology agnostic, applying efficiently to new technologies as they emerge?

We submit that a combination of the proposed mechanisms can support established pathways, as well as specifically de-risk emerging technology.

Section 4. Emissions and sustainability criteria:

Do you support an emissions reduction threshold being included as part of eligibility criteria for fuels to receive support under a production incentive program? What threshold would you seek be included in eligibility criteria (for example 50 per cent emissions reduction relative to conventional fuels, or another emissions reduction ratio)?

We support the inclusion of emissions reduction thresholds as part of the eligibility criteria for fuels to receive support under a production incentive program. However, during the early stages of development, it is key that the criteria are sufficiently inclusive to encourage widespread LCLF production and usage, supporting supply to meet demand. A balanced approach could prioritize fuels with the highest emission reductions through a tiered system where different levels of emission reduction receive varying degrees of support or incentives.

Do you think any threshold should increase over time?

Yes, we support thresholds that are periodically reviewed and gradually increased as technology advances and emissions reduction capabilities improve. This approach enables the deployment of existing pathways while encouraging the deployment of new technologies. It provides a clear signal for continuous improvement in emissions performance, fostering innovation and supporting decarbonisation.

Do you think incentives should be included to encourage emissions reduction in addition to a minimum eligibility threshold?

No comment.

If you don't support a threshold, what emissions requirements do you think are better?

No comment.

Do you have views on the sustainability criteria under consideration as part of the criteria?

We support the expansion of the Guarantee of Origin Scheme to include LCLFs. Inclusion in the GO Scheme ensures that LCLFs can compete on equal footing with other energy sources in energy markets. This recognition will stimulate market competition, foster investor confidence, accelerate project development, and lead to increased uptake and reduced emissions.

The sustainability criteria for the Scheme should align with existing international models while also being adapted to suit Australia's specific context/parameters and support local feedstock. Global sectors such as aviation, maritime, and feedstock already need to meet several different international standards. Therefore, Australian standards should be developed in a way that aligns with these to ensure harmonisation and avoid creating additional burdens.

Examples of international regulatory frameworks for calculating and certifying emission reductions that already exist and have been globally adopted include:

- The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model (GREET) - is a tool that examines the life-cycle impacts of vehicle technologies, fuels, products, and energy systems (U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy).
- ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) - is a global carbon offset and carbon reduction scheme to lower CO2 emissions for international flights, to curb the aviation impact on climate change.
- RSB Standard - RSB is a global certification scheme that defines sustainability standards for bio-based products, with its own life cycle assessment methodology and certification system.
- International Sustainability & Carbon Certification (ISCC) - ISCC has a certification and sustainability scheme, that uses the methodology defined by the specified program its certifying (eg. CORSIA or RED II).
- GHGenius in Canada - GHGenius is a lifecycle analysis (LCA) model with a primary focus on transportation fuels in Canada.

The above are already globally adopted and could be adapted for use with Australian specific feedstock and production characteristics to maximise compatibility.

What additional or alternative criteria would you want to see form part of the criteria?

Sustainability criteria are essential for assuring consumers and the public that LCLFs produced and used in Australia are effective in reducing emissions and meeting environmental and social expectations. These criteria should consider the overall impact of the product and its supply chain, including carbon intensity, water and land use change, and social impact.

We also caution the Government against setting requirements that exclude certain feedstocks (e.g., the HEFA cap proposed in the UK). Instead, we support lifecycle assessment (LCA) models to determine the overall environmental impact of feedstocks and fuels across their entire lifecycle.

Do you have any other views on emissions and sustainability criteria?

We stress the importance of the Government leveraging existing international schemes so that Australia's criteria can be established quickly. This is imperative for project developers to understand the standards they will need to meet and their CI scores for business cases and investment. Delaying the development of these sustainability criteria will lead to more investment being directed to international jurisdictions with standards in place, causing Australia to fall further behind in the LCLF space.

What are the community benefits associated with LCLF production in Australia?

Community benefits associated with LCLF production in Australia include:

- **Employment and economic growth:** The LCLF industry can offer substantial employment and development opportunities for regional Australia. Capitalising on Australia's bioenergy potential could lead to $10 billion in GDP per annum being added to the economy over the next decade, along with 26,200 new jobs (predominately regional).[39]
- **Agricultural revenue streams:** LCLF production often relies on agricultural feedstocks, providing additional revenue streams for farmers and supporting rural development and diversification.
- **Job retention and transition:** LCLF industry will enable traditional/ legacy energy workers to retain their jobs while adapting to cleaner energy sources. This benefit was highlighted in the Jobs and Skills Australia Report, estimating that existing workers in petroleum refining (around 1,500 in 2021) could easily transition to biofuel employment, including at the same worksite.[40]
- **Fuel security:** Reducing reliance on imports (currently accounting for 90% of Australia's liquid fuels), strengthening national fuel security, diversifying domestic fuel mix, reducing supply chain vulnerabilities and promoting domestic energy independence.[41]
- **Waste management solution:** LCLFs support a circular economy — where waste and pollution are reduced, resources are circulated to their highest value point, and nature is regenerated. A domestic LCLF market would incentivise the recovery and use of the energy, nutrient, and heat values of Australian agricultural residues rather than allowing this feedstock to decay in fields, burnt off or primarily exported to international markets, thus, failing to secure this value domestically.
- **Emissions reductions and public health:** Significantly reduces emissions, including non-CO2 sulphur and ultrafine particulate matter, thereby enhancing local air quality and public health.[42]
- **Preserves Australia's tourism industry:** Ensuring Australia maintains international connectivity by enabling refuelling of international vessels with LCLFs that meet global decarbonization standards and mandates, thereby preserving robust and uninterrupted international tourism connectivity aligned with global decarbonization efforts.

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[39] Australia's Bioenergy Roadmap, ARENA, 2021

[40] Jobs and Skills Australia, 'The Clean Energy Generation: workforce needs for a net zero economy' (October 2023)

[41] ICF Report, 'Developing a SAF industry to decarbonise Australian aviation' (November 2023), p2.

[42] Rhodium Group, 'Sustainable Aviation Fuels: The Key to Decarbonizing Aviation' (2023)

Section 5. Design of demand-side mechanisms:

What options should the Government consider in its regulatory impact analysis, such as a mandate introduced over time, low carbon fuel standard connected with a trading scheme, a non-binding target or other demand options?

We recommend the following demand-side mechanisms are considered:

- A regulated demand side lever tied to carbon intensity including:
    - Low carbon fuel standard connected with a trading scheme
    - A mandate introduced over time
- Government procurement targets (i.e. Defence and Government Department and Agencies)
- Extending excise/fuel tax mechanism to support renewable fuels and enable growth of new renewable fuels (e.g. SAF and renewable diesel) in the market.

We stress the importance of developing both supply-side and demand-side support in tandem. This approach is critical to ensure the industry has clarity on timing and requirements, which are essential for securing project investment. Committing solely to one type of support—whether supply-side or demand-side—will not be effective. However, integrating both forms of support can distribute costs across the industry, establishing a coherent and effective framework for support. Without guaranteed domestic demand, domestic producers may be compelled to export fuels to other markets, competing with fuels supported by their own governments.

What demand-signals would best drive confidence and certainty for a domestic LCLF production industry?

Mandate/LCFS: We strongly support implementation of a mandate introduced over time and low carbon fuel standard, connected with a trading scheme. This design can be implemented in the short term and incrementally increased over time as domestic production capabilities expand. Such an approach allows industries to adapt and invest in scaling up production without immediate strain.

Key design considerations:

- Scope: Sector specific or a sub-target of a broader renewable fuels demand mechanism; implemented with a link to carbon intensity.
- Magnitude & Timing: The initial thresholds for the signal, phase-in timings, and ramp up.
- Australia-appropriate sustainability standards: The imperative of performance-based LCA criteria grounded in Australian conditions and aligning with existing international models.
- Compliance & Enforcement: The need for a trading mechanism to facilitate market development and setting a buy-out price (or credit price cap) that is high enough to meaningfully incentivise compliance.
- Mitigation of Unintended Consequences: Management of asymmetric impacts on competition and customers (e.g. not creating an uneven playing field for lower cost airlines),

and on discontinuities in fuel production incentives (e.g. renewable diesel relative to SAF)

Examples:

- UK SAF Mandate: New targets to ensure 10% of all jet fuel in flights taking off from the UK comes from sustainable sources by 2030 (approximately 1.5 billion litres). This includes a 2% SAF Mandate for 2025 and a progressive trajectory of related caps and obligations on industry.[43] Some key design elements of this Mandate include:
    - Periodical Review Assessment: Targets will be continuously assessed and formally reviewed at least every five years. The government will immediately review the mandate in case of a shortage causing significant unexpected price increases or potential buyout.
    - Stability and Predictability: Sufficient duration: Target is currently set for 15 years, from 2025 to 2040 to provide certainty to SAF producers and investors.
    - Recognize and promote emissions reduction performance: The Mandate will deliver carbon savings by setting annual targets on fuel suppliers to blend in a proportion of SAF into their fuel supply. It will operate as a tradeable certificate scheme where the supply of SAF is rewarded in proportion to its GHG emissions reductions.
    - Harmonization and interplay with other domestic and international policy (stackability): The mandate will operate alongside the UK ETS, RTFO scheme, EU ETS, and CORSIA, allowing airlines to make emissions reduction claims under the UK ETS for eligible SAF.
    - Access to financing instruments to create price certainty (de-risk investment and provide stability): Government announced plans to design and implement a revenue certainty mechanism to attract private investment and enable SAF projects to be deployed at scale in the UK. The announcement also clarified that any mechanism will be industry-funded.[44]
- Singapore SAF Target: The Civil Aviation Authority of Singapore (CAAS) has launched the Singapore Sustainable Air Hub Blueprint as part of its efforts to decarbonise Singapore's aviation sector while enabling sustainable growth. This Blueprint includes the required use of SAF in flights departing Singapore starting in 2026. The requirement is expected to phase in starting at 1% in 2026, increasing to 3-5% in 2030, subject to global developments and the wider availability and adoption of SAF.[45] CAAS will also introduce a SAF levy on users (i.e. passengers and cargo) for the purchase of SAF. Key design considerations include:
    - Passenger levy will vary based on factors such as distance travelled and class of travel
    - Cargo levy will vary based on factors such as distance travelled and cargo weigh
    - A fixed cost envelope approach will be adopted where the SAF levy will be set at fixed quantum based on SAF target and projected SAF price.

[43] UK Government 'Aviation fuel plan'

[44] IATA, 'Supply push vs demand-pull: What is the right policy approach for upscaling SAF?' (SAFAANZ) & CFA Information Session (July 2024)

[45] The Civil Aviation Authority of Singapore (CAAS), 'Singapore Sustainable Air Hub Blueprint' (2024)

- As an indication, for a 1% SAF uplift in 2026, CAAS estimates that the levy for an economy class direct flight from Singapore to Bangkok, Tokyo and London to be SGD3, SGD6 and SGD16 respectively. Levies for premium classes will be higher.

- **Japan SAF Mandate:** In Japan, a SAF mandate was introduced by the Ministry of Economy, Trade, and Industry (METI) in May 2023 and intends to replace 10% of jet fuel with SAF by 2030.[46] To support this they are also include support measures such as support for initial investment and feedstocks supply chain (336.8bn JPY in CAPEX), introduction of tax credit for SAF production (30JPY/litre) and consideration of tariff and petrol tax exemptions for feedstock and imported SAF.[47]
- **California's Low Carbon Fuel Standard (LCFS):** Low Carbon Fuel Standards are a variant of a mandate where volumes are based on an emissions intensity reduction trajectory and apply across all fuel use, not just jet fuel. Implemented in California, with success observed in reducing emissions in line with stated targets and delivering regional economic benefits to value chain participants. Recent analysis suggests the Californian LCFS has increased fuel prices for consumers by around 8c/L.[48]
- **British Columbia, Canada, Low Carbon Fuel Standard:** The BC-LCFS Program sets carbon intensity reduction targets for transportation fuels, and these targets are gradually increased over time. Fuel suppliers are required to meet these targets by either blending lower-carbon fuels into their products or purchasing credits from other suppliers who have succeeded to exceed their targets. This program covers both road and aviation but implements a slower reduction schedule for aviation (given the nascency of the SAF market relative to renewable diesel) and includes a volumetric sub-mandate for SAF (starting at 1% in 2028, 2% in 2029 and 3% in 2030) to ensure SAF adoption.[49]
- **ReFuelEU aviation**: The first blending obligation for SAF commencing in 2025. EU airports will be required to provide aviation fuel containing 2% SAF by 2025, growing to 5% by 2030, 32% by 2040 and 63% by 2050. It should be noted power-to-liquid (PtL) synthetic SAF is mandated to comprise 0.7% by 2030, 8% by 2040 and 28% by 2050. [50]
- **Air France:** Since 2022, French regulations have required an average of 1% SAF on flights departing from France (from 2025 this will be adapted to the broader EU mandate under the ReFuel initiative). Due to lack of adequate supply side support, the cost of SAF is up to six times the cost of conventional jet fuel and not all aircraft operators have been able to access SAF, causing a non-level playing field.[51] To manage the resulting costs from the mandate, Air France is including a levy for SAF in the price of all tickets. In 2023, the airline says that the

[46] InfluenceMap, Sustainable Aviation Fuel (SAF) mandate.
[47] IATA, 'Supply push vs demand-pull: What is the right policy approach for upscaling SAF?' (SAFAANZ) & CFA Information Session (July 2024)
[48] Deloitte, prepared for the Queensland Department of State Development, Infrastructure, Local Government and Planning 'Preparing for take-off: the case for public-private collaboration to catalyse an Australian SAF value chain' (September 2023).
[49] British Columbia's Low Carbon Fuel Standard: Pioneering Clean Fuel Standard Programs
[50] SKYNRG, 'A summary of the proposed sustainable aviation fuel mandate' (2021)
[51] IATA. 2023. IATA SAF Policy Workshop – Example and Lessons Learnt. Delivered to SAAFANZ on 31/08/2023.

amount will vary between €1 and €8 in economy and between €1.50 and €24 in business, depending on the distance.[52]

- Sweden has also introduced a SAF mandate, commencing in 2021 at 0.8% of fuel sold, growing to 27% by 2030.[53]
- India is considering a SAF mandate of 1% by 2027 and increasing to 5% by 2030 for international flights.[54]

Leveraging Government procurement: Setting government procurement targets (i.e. Defence and Government Department and Agencies) would also strengthen market confidence and encourage investment. This could include:

Examples:

- Defence commitment to 10% domestically produced LCLFs by 2030: An effective way to promote a domestic LCLF industry is through defence fuel procurement. A commitment from the ADF to be an early cornerstone customer of Australian-produced LCLFs would be a leap forward for the development of a domestic industry, acting as a direct market signal, elevating the Federal Government's commitment in this space, and giving industry certainty that policy levers will be put in place to ensure its success.

- Funding to support Federal Government staff flights to include 10% domestically produced SAF by 2030: To stimulate demand for locally produced LCLFs, the Federal Government could set a target for, and fund, public service participation in airlines' voluntary consumer purchasing programs. This commitment could require the establishment of a national framework to enable customers to opt-in to procure a portion of SAF for their flight and should be designed to incentivise domestic SAF production over SAF procured in other countries (once domestic production in underway). A public service target would be considered a key market signal for producers, investors and airlines, providing a funding base to support and underwrite project development. A successful model of this proposal is the KLM Corporate SAF Program in the Netherlands, where public servants flying on KLM pay a premium for their ticket to opt-in to the airline's SAF purchasing program, reducing the government's carbon footprint in the process.[55]

Extending excise/fuel tax mechanism: Supportive taxation treatment is required, and this may include maintaining and extending excise/fuel tax mechanism to support renewable fuels and enable growth of new renewable fuels (e.g. SAF and renewable diesel) in the market. For example, we recommend that renewable diesel receives similar excise taxation treatment as biodiesel. Without such treatment, the business case for a renewable diesel project becomes less attractive, diminishing the likelihood of its progression and hindering the growth of new renewable fuels in the market.

[52] KLM doubles sustainable fuel surcharge to cover cost of more SAF (2023)
[53] Neste: Sweden becomes a frontrunner in sustainable aviation (2020).
[54] Civil Aviation Authority of Singapore (CAAS), 'SUSTAINABLE AVIATION FUEL (SAF)'
[55] The World Economic Forum, 'Clean Skies for Tomorrow: Sustainable Aviation Fuel Policy Toolkit' (November 2021)

How might demand measures interact with the Safeguard Mechanism for covered facilities?
Demand measures would incentivise increased usage of LCLFs, reducing emissions from covered facilities and helping them remain within their emissions baselines under the Safeguard Mechanism. However, it's important to avoid potentially delaying the development of sustainability criteria for LCLFs by overly focusing on the Safeguard Mechanism.

How would the application of a mandate affect your business/operations? How would the introduction of a mandate or other demand measures affect competition in your industry?

Potential benefits of a mandate:

- **Offtaker assurances:** A mandate creates certainty regarding the adoption of future fuel types and levels the playing field for offtakers, preventing any competitive disadvantage for early adopters. Without a mandate, offtakers are unlikely to purchase LCLF due to the price premium. Therefore, a mandate can support the business case for its adoption.
- **Provides a clear market signal**: A mandate signals long-term demand for LCLFs, encouraging investment in production technologies and capacity.
- **Market Assurance**: Producers gain certainty of market demand, which promotes stable supply chains and encourages growth in the LCLF sector. It can help the economics of a project and attract investment.
- **Emissions Reduction**: Mandates drive reductions in emissions from hard-to-abate sectors like aviation and heavy transport, contributing to environmental goals and enhancing sustainability credentials.
- **Competition**: Fuel suppliers would need to compete on lowering CI of fuels in order to meet a mandate.
- **Levels playing field**: A mandate would require all industry players to adhere to the same standards, leveling the playing field and fostering fair competition.
- **Domestic advantage:** Importers might face increased competition from domestically produced LCLFs, especially if domestic production scales up to meet new demand.

Potential drawbacks of a mandate:

- **Supply challenges**: Insufficient supply of LCLFs could lead to non-compliance with the mandate, especially if production capacity lags behind demand projections.
- **Technological support needed**: Without adequate support for emerging technologies, such as feedstock development or production processes, there may be limitations in meeting mandated volumes.
- **Higher costs:** There is a cost premium for LCLFs compared to traditional fossil fuels. If this price gap is not addressed, end users will inevitably face higher fuel costs under a mandate. Airlines and transport companies are likely to pass on these increased costs to consumers through higher ticket prices or freight charges.
- **Competitive landscape**: Small or new entrants may struggle with compliance costs, potentially reducing market competition.

Should demand-side interventions be designed to only apply to some areas of the market and not others? Which sectors or sub-sectors should demand-side interventions apply?
We support prioritising LCLFs to decarbonise Australia's hard-to-abate sectors and support demand-side interventions being applied across these sectors.

We recognise that sub-targets can be beneficial as they enable tailored interventions to address specific challenges or opportunities within different sectors. By strategically focusing interventions, governments can maximise impact, ensure efficient resource allocation, and support targeted market development. This approach also considers factors such as industry maturity and technological readiness.

The Government should consider a combination approach where a Low Carbon Fuel Standard is applied across all hard-to-abate sectors, with sector-specific sub-mandates (such as for aviation) also applied. This dual strategy could optimise decarbonisation efforts while accommodating sector-specific needs, maturity and conditions.

Should design of a mandate, low carbon fuel standard, target or other demand option create requirements for a certain proportion of fuel use be drawn from Australian produced LCLF?
Yes. However, given Australia's current limited domestic production of LCLFs, it may not be feasible to mandate significant amounts of locally produced LCLFs during the initial phase. As projects for domestic LCLF production mature and become operational, higher requirements for locally sourced LCLFs could be phased in.

How would the introduction of demand side measures impact the feasibility of domestic production of LCLFs, and what impact would this have on the appropriate design of any production support?
Implementing demand-side measures for LCLFs is crucial to support domestic production by ensuring a stable and guaranteed market demand. This predictability encourages local producers to expand their production capacities, knowing there will be a consistent market for their products. Without such measures, producers may hesitate to invest in new projects or maintain current production levels due to market uncertainty. Therefore, demand-side measures play a critical role in fostering the growth and sustainability of domestic LCLF production.

This emphasises the critical importance of designing both supply-side and demand-side measures in tandem to ensure they effectively complement each other.

Thank you for the opportunity to provide this submission. [redacted]

Sincerely,

Shahana McKenzie
CEO Bioenergy Australia