LCLF Policy Consultation

[redacted]

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Public Submission
Yes (except for project details, which are private)

Remain Anonymous
Yes

Question 1.1: Which LCLF should be eligible under the program and why?
A broad range of low carbon liquid fuels (LCLF) should be considered eligible under the program including, sustainable aviation fuel (SAF), renewable diesel (RD), methanol, and others. While the drop-in compatibility of fuels such as SAF and RD is attractive, both face limitations which are discussed further below. The program should be technology-agnostic within reasonable bounds and explicitly accommodate a broader range of alternative fuels.

Question 1.2: Should certain types of LCLF be prioritised over others?
See 1.1.

Question 1.2a: Should LCLF suitable for particular sectors or uses be prioritised? For example, should sustainable aviation fuel be prioritised over renewable diesel?
This issue requires careful consideration. Aligned with the policy objectives, we recommend focusing on industries that will be limited to the use of LCLF to decarbonise both in the near and long-term, such as aviation and maritime.

This approach should be informed by a broader economy-wide decarbonisation blueprint, including an allocation of required abatement effort by sector and national objectives for improving energy security. Such a framework would provide guidance on the appropriate role and scale of low-carbon fuels and other decarbonisation pathways within each sector, and inform a desirable future scope and scale of Australia's future LCLF industry.

For example, some sectors such as aviation will be expensive to decarbonise however LCLF will likely be their only viable solution even in 2050. Conversely supporting the production B100 for blending in diesel will be a cheaper cost of abatement however may delay the uptake of long-term land transport electrification. If the program was to only focus on B100 it may delay electrification at the cost of not building a local SAF industry and bring down costs through scale.

Question 1.2b: Should LCLF for certain sectors or uses be de-prioritised due to other viable decarbonisation pathways?
See 1.2a

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Question 1.2c: What market impacts are anticipated by influencing prioritisation of particular fuel types?

SAF and RD should be eligible under the policy, but they should not be the only fuels permitted. While their drop-in compatibility is attractive, both face limitations and potential adverse market impacts:

- **High cost of abatement:** SAF and RD remain among the more expensive decarbonisation pathways on a cost-per-tonne basis
- **Feedstock constraints:** Both rely on finite and competing feedstock supplies, which limits scale
- **Sector limitations:** These fuels are not universally applicable, particularly in hard-to-abate sectors such as deep-sea shipping
- **Reduced competitive pressure:** Limiting eligibility to only two fuel types risks entrenching incumbents, restricting innovation, competition and cost reduction
- **Technology lock-in:** A narrow definition constrains investment in alternatives, reducing future potential technological progress and potential breakthroughs in alternative fuel pathways
- **External accreditation dependence:** Eligibility tied to third-party certification regimes (e.g. ASTM for SAF) introduces over-reliance on standards outside Australia's direct control. Consideration should be given to how Australia can best participate in international standard-setting

Accordingly, the policy should be technology-agnostic within reasonable bounds and explicitly accommodate a broader range of alternative fuels, including but not limited to methanol and other low-carbon fuel pathways.

Question 2.1: Should the production credit be a fixed amount per litre of production, or a variable amount that depends on the market price of LCLF?

Before answering this question, we emphasise the fundamental importance of combining an LCLF policy under this scheme with a demand-side mandate, obliging users of liquid fuels to decarbonise on a level compliance playing field.

Large-scale decarbonisation of hard to abate sectors in Australia (and the development of a domestic industry to service it) cannot be achieved with the A$1.1B scheme alone. For example, the current unsubsidised cost of abatement of the most competitively produced SAF globally is circa. A$1000/ton of CO2. Therefore, if this A$1.1B LCLF fund had to shoulder the full burden of this cost, only circa. 100,000 tons of CO2e emissions could be avoided per annum. To put this figure into context, that is a mere 0.023% of Australia's annual CO2e emissions, hardly worth the effort of implementing the program.

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Even if a LCLF program was coupled with a demand side mandate as recommended, a fixed, per-litre production credit is unlikely to deliver efficient or durable outcomes. Reasons for this are provided in 2.1a below.

By contrast, a variable mechanism linked to market prices or abatement outcomes can more precisely target emissions reductions, improve investment certainty for project backers, protects taxpayers, and avoid long-term subsidy entrenchment. We discuss options for how such a mechanism could be implemented in 2.1 below.

Question 2.1a: Are there any potential benefits, risks or constraints considering the two different production credit options below?

Although they are a relatively clean and simple solution to administer, our stance is that a fixed, per-litre production credit is unlikely to deliver the most efficient outcomes with Australia's available LCLF funding, nor will it provide the basis to get early projects built. In particular, per-litre credits:

- **Ignore carbon intensity:** They reward volume rather than abatement Which is misaligned with the policy objectives.
- **Do not reliably support final investment decisions (FID) in projects:** Project financiers and investors require revenue certainty or a downside price floor, for example to cover debt repayments; a fixed production credit does not materially reduce market risk or enable "bankability".
- **Represent an inefficient use of taxpayer funds:** Production credits are inherently budget-constrained, limiting the number of projects that can be supported and so reducing overall abatement per dollar spent.
- **Provide no upside to taxpayers:** Fixed credits capture no value if market conditions improve or costs fall, meaning the public sector bears downside risk without sharing in upside outcomes.
- **Create structural dependency:** Fixed production subsidies can become an artificial prop for the industry, minimising incentives to drive down costs and challenging to "wean off" at the end of their planned lifetime.
- **Puts government into a "kingmaker" role:** Setting fixed per-litre credits on a project-by-project basis requires government to determine the level of subsidy each project receives. If the government over-estimates the subsidy a project receives, this risks distorting competition and unnecessarily over-spending budget on projects; if it under-estimates, this leads to misallocated capital and failed projects, with limited recourse for taxpayers.

[redacted] Contracts for Difference (CfDs) or price-floor mechanisms can play a more effective role in the early stages of Australia's low-carbon liquid fuels (LCLF) market development, particularly where revenue uncertainty is the primary barrier to projects reaching FID. When properly designed, CfDs can improve bankability,

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accelerate first-of-a-kind technology deployment, and reduce financing costs in ways that per-litre production subsidies cannot.

However, we would like to note that CfDs are not a silver bullet. If poorly calibrated, incorrectly awarded, or not properly linked to emissions outcomes, they can also result in inefficient allocation of public funds and long-term subsidy dependence. To be successful, a CfD program would need to address the following key issues:

- **Strike-price calibration risk:** CfDs require government to set or discover an appropriate strike price, embedding assumptions around costs, learning curves, demand growth, and future policy settings. Poor calibration can either undermine bankability or create windfall gains for supported projects.
- **Potential misalignment with abatement outcomes:** Unless explicitly linked to verified emissions reductions, CfDs would still reward production volume rather than carbon abatement impact, replicating weaknesses inherent in volume-based support mechanisms. If correctly structured the program would incentivise producers to lower the carbon intensity over time, reducing their overall cost and improving the overall abatement impact for a given capital investment.
- **Technology and pathway lock-in:** Early CfD frameworks may inadvertently favour incumbent or better-understood technologies, crowding out alternative pathways that could deliver lower-cost or more scalable abatement over time.
- **Weakened market discipline:** Guaranteed revenue floors can reduce incentives for cost reduction, operational optimisation, and responsiveness to market signals, particularly under long-dated contracts. Mechanisms to preserve competitive pressure and performance incentives to reward innovation should therefore be considered.
- **Dependency and exit risk:** If projects remain uneconomic at contract expiry, governments may face pressure to extend support, perpetuating subsidy reliance rather than enabling the transition to a self-sustaining market.

Question 2.1b: What outcomes do you think can be delivered with the available funding?

As highlighted in 2.1 the A$1.1B would have limited impact if used as a sole lever to bridge the cost gab between fossil jet fuel and SAF for example. Using a CfD type structure may stretch the funds further.

Historically the market price for SAF (as provided by Argus Media) has been disconnected from fossil jet. This is related to the production and demand drivers for SAF being disconnected from traditional oil markets. Where fossil-based jet prices are generally driven by geopolitical impacts SAF markets are primarily driven by local policies such as demand mandates.

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Using a CfD mechanism there is potential for significant domestic SAF production to be supported. For example, if we considered Argus "ARA" SAF index delivering ~75% abatement from Jan-2023 to Nov-2025, the average price was ~A$3/L. If we considered a production cost of A$4.0/L and deploying A$100M per annum of funding support 100ML of production could be supported. This would change as market prices, demand and production costs decline.

This is a simple analysis and does not consider in detail the carbon intensity of different SAF pathways, which we emphasis is critical. Detailed modelling would need to be completed to assess the full potential.

Question 2.1c: What type of mechanism provides the greatest investment certainty or level of bankability to projects?

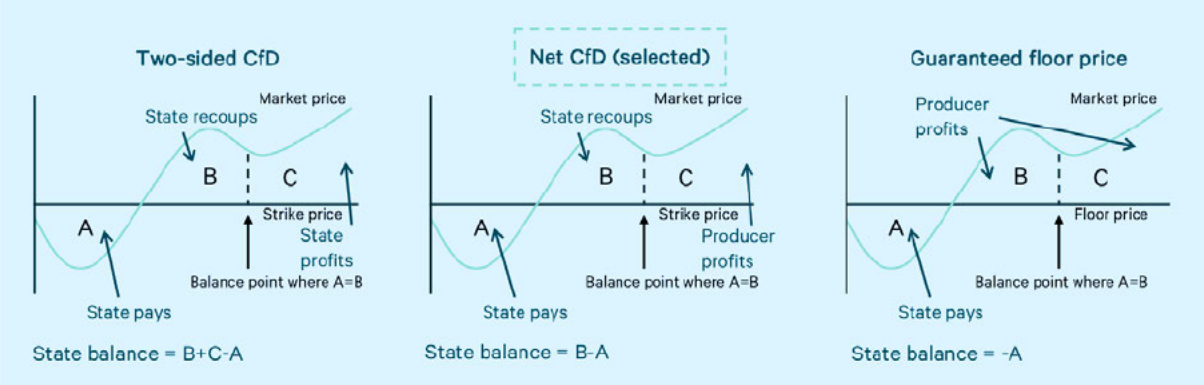
A CfD including a price floor; When properly designed, CfDs can improve bankability, accelerate first-of-a-kind technology deployment in Australia, and reduce financing costs in ways that per-litre production subsidies cannot.

Question 2.1d: How can this support be structured to prevent substantial upside to producers?

[redacted] **would recommend considering two options.**

1. Considering a net CfD or collared CfD mechanism (see figure 1). This approach gives consideration not only for low cost debt being support by a price floor but also to ensure higher risk equity is exposed market upsides.
2. The CfD Bank: The CfD is banked across multiple years. The project can draw upon the bank in low revenue markets (below strike price) and deposit into the account in high revenue markets (pre-tax). The account could be a rolling account and with it being topped up drawn down by the project. This has the potential to reduce the exposure to super profits but also support equity to access substantial upside attractive investment. It provides a multi-year mechanism to flatten revenue streams in markets where there is volatility.

Figure 1. Net CfD (collared) mechanism visualisation

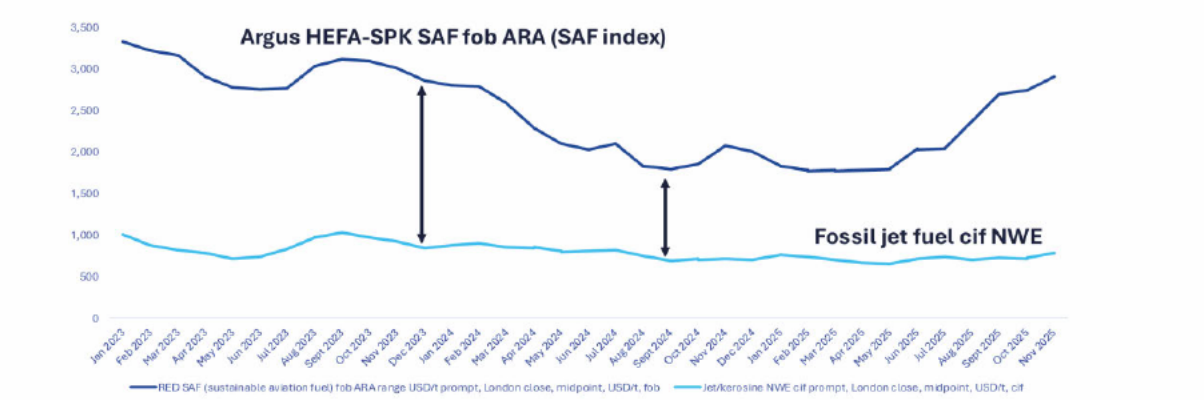


Question 2.1e: How do you consider pricing for LCLF will be set over the short-medium term and longer term? Will pricing be matched to a premium on equivalent fossil fuel or price of imported LCLF or be on a carbon abatement basis?

Pricing of LCLFs is unlikely to follow fossil fuel-based trends. As mentioned in 2.1b the price drivers such as demand and costs are largely driven by other factors such as feedstock price, renewable electricity prices, project capacity coming online and demand side mandates.

The below chart, provided by Argus Media, illustrates this.

HEFA SAF disconnected from jet – market transitioning to Argus SAF index



Our view is that LCLF pricing should be linked directly to the cost of carbon abatement, meaning that lower "carbon intensity" fuels should attract a market premium over higher carbon intensity fuels. This approach best aligns the price of the fuel with its intended outcome, to decarbonise cost-effectively.

However based on our market consultation, we note that in some early cases LCLF pricing is currently being set to a premium versus fossil fuels, for ease of pricing in the short to medium term when LCLF are being introduced to the market and there is a need to integrate LCLF pricing with procurement policies for fuel users, who typically have budgets, pricing mechanisms, contracts and delegations of authority linked to fossil fuel pricing. We see this as being a short to medium term state, transitioning to being priced on a carbon abatement basis longer term.

Question 2.2: To deliver the policy intent of the Program while maximising the value for taxpayers, do you agree that projects with the lowest cost should be prioritised under the Program, with the cost being measured either as per unit of LCLF produced or as per unit of carbon emissions abated?

In general the focus of the policy should be on supporting the lowest cost of carbon abatement. The program should consider the overall national decarbonisation strategy and make sure the support is aligned with the sectors that will be dependent on LCLF for the medium to long-term. If the policy was only to look at the lowest cost of abatement for LCLF across all sectors then FAME-B100 would be the most cost effective. However this would not address other focus areas of the policy. The policy should have consideration for pathways that have viable cost reduction and scaling potential and have the potential to be more competitive than incumbent technologies.

Question 2.3: Should the production credit be linked to the quantum of LCLF produced, or the carbon emissions saving potential of the fuel?
To the carbon emissions saving potential of the fuel

Question 2.4: What are your views on the cost to deploy LCLF domestically compared to internationally? Is there a local premium for domestic production?
Australia does have the ability to compete internationally in the deployment of LCLFs due to our high level of resource (biomass and renewable energy). The cost of deployment in Australia is expected to be higher than international producers due to our high labour costs, high cost of capital, relatively small scale, and high regulatory burden. In a commodity-based industry such as LCLFs it is unlikely Australian based production will receive a premium over international imports.

China is leading the world in LCLF production driven by an export focused industry of UCO, FAME, HVO and growing Methanol Market. China benefit from relatively low cost of capital, low cost of labour, large scale and relatively low regulatory barriers.
The US has also developed a strong bioeconomy largely driven the ethanol industry which has been underpinned by strong, long-term government policies.

Question 2.5: Should the total value of production credits be capped for each project? If yes, what should the capped amount be and why?
In principle, we do not support a hard cap on production credits that could truncate contracted revenues and undermine bankability. However, we do support well-designed safeguards that achieve the same public-interest outcome without introducing revenue discontinuities that would concern lenders.

In practice, this is best achieved through:

- Collared or net CfDs (or equivalent mechanisms) that automatically claw back upside when market prices exceed the strike; and/or
- Balancing or "bank" accounts that smooth revenues over time and limit net taxpayer exposure over the life of the contract.

Where a cap is considered necessary for budget management, it should be:

- Soft rather than hard,
- Time-based (annual) rather than life-of-project, and
- Calibrated to cover downside risk only, not to constrain normal operations or debt service.

This approach protects public finances while maintaining the revenue certainty required for projects to reach FID.

Question 2.6: Should production be focused on domestic supply only or should export also be permitted? What impact could restriction have for projects or the market?

Production should be permitted to serve both domestic and export markets, subject to clear conditions that prioritise Australia's fuel security and decarbonisation objectives. Restricting supported production exclusively to domestic supply at this stage would materially increase project risk, limit scale, and deter investment, given the current absence of binding domestic demand signals for low-carbon liquid fuels.

At the same time, where public funding or production support is provided, it is appropriate that Australian taxpayers receive a clear and tangible benefit. This can be achieved by:

- Requiring a defined domestic offtake obligation or first-right-of-refusal at competitive market terms;
- Allowing export of surplus volumes to support project scale, cost reduction, and international competitiveness; and
- Ensuring that public support mechanisms such as CfDs are structured to prioritise domestic decarbonisation objectives, rather than subsidising exports in perpetuity.

A balanced approach that enables exports while anchoring domestic supply obligations will support the industry to scale, maximise investment, reduce long-run costs, and support production resilient.

Question 2.7: Is there a role for combined production support with capital grants for first-of-a-kind facilities?

Yes. Up front capital support is an effective and efficient way to support first of a kind facilities. Deployment of capital grants material impacts project chance of success it improves project near-term cash flows improving payback periods and returns. Capital grants are efficient compared to non-CPI linked production support mechanism due to the time cost of money.

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In particular early stage support getting projects to FID have the most affect at de-risking projects and crowding in private capital.

Initiatives such as the Future Made in Australia announced A$250M LCLF capital support scheme go a long way to addressing the need for such support.

Question 2.8: What other types of funding or concessional finance could support LCLF projects (e.g. funding from CEFC and NRF)?

Funding from the CEFC and NRF could greatly assist and accelerate industry progressing by providing early stage funding or support first of a kind projects, in particular in the pre-FID "development" stages of projects (feasibility, pre-FEED, FEED). In the LCLF space these development phases are complex and capitally intensive, involving a level of risk which traditional private markets cannot always accommodate, and are therefore where CEFC and NRF can be of greatest assistance. Though these At FID we expect the CEFC, NRF and associated Export Credit Agency (EFA) will play a role in the capital stack. The ability for these agencies to take longer debt tenor will support projects successfully finance.

Question 2.9: Is any other support required across the supply chain to enable domestic production of LCLF?

A demand-side compliance mandate (meaning a mandatory obligation on fuel users or fuel markets to decarbonise over time) is essential to promote the industry. It will be challenging to build a low carbon fuels industry in Australia without this.

Such a mandate should be designed so that it is not 100% met with imported product, as this would not achieve any of Australia's fuel security objectives. One way to achieve this could be to give domestic supply a "double count" on CO_2 abatement values, to give Australian projects a temporary leg up in their early stages of development, similar to the double counting policies used in the EU to promote low carbon feedstocks (see question 3.1 for further discussion on double count policies).

Question 2.10: What lessons can Australia learn from other jurisdictions that have already implemented LCLF production support measures?

One of the key lessons is to ensure a holistic policy framework is developed with a long-term view. A key lesson is that supply side production credits need to be coupled with a durable demand side policy to create a lasting LCLF market. One example of this is the USA, where the Section 45Z Clean Fuel Production Credit is a production credit (per gallon/gallon-equivalent) and is carbon-intensity–based. But it is not the only scheme supporting the industry. USA also has the Renewable Fuel Standard (RFS), which is a blending mandate enforced via tradable credits and volume-based obligations.

If the goal is a self-sustaining industry rather than a small number of subsidised projects then both supply and demand need to be catered for. A production credit helps supply economics, but a mandate/standard (or equivalent demand-pull policy) can do three things a credit alone struggles to do:

- Creates durable, bankable demand
- Supports a price signal, so that projects don't rely purely on discretionary subsidies
- Scales volumes so key enabling elements such as infrastructure, certification and supply chains justify investment

Question 3.1: Considering the objective below, what production pathways should be focused on or prioritised?

The Program aims to support projects at a mature stage of development and late-stage Technology Readiness Level technologies that can deliver meaningful volumes of LCLF to the market to help decarbonise hard-to-electrify sectors.

As discussed in 1, the program should be technology agnostic and linked to the technologies potential for achieving a competitive cost of carbon abatement at scale. HEFA for producing SAF and RD is considered a mature stage LCLF technology. However there are other technologies such as gasification and methanol to jet which are of a suitably high technological readiness level, better suited to Australia's available feedstock supply systems, but because they have not been deployed in Australia before require more commercial support in the short term. These technologies are arguably therefore more deserving of support.

Question 3.1a: Should priority be given to projects that use more-established production pathways (e.g. HEFA and HVO) than nascent production pathways that may present a higher level of technology risk?

No. See 3.1. HEFA and HVO, whilst more technologically advanced than certain other pathways, have limitations in accessing sufficient waste feedstocks to achieve carbon abatement goals at scale in Australia. For example, there is only circa 0.5M tons of available waste tallow per annum in Australia, and significantly smaller quantities of used cooking oil. Oil crops such as canola, can be developed in Australia to achieve greater scale but introduce food versus fuel concerns and pressure on land use change, meaning they do not necessarily deliver the most competitive carbon abatement costs on an LCA basis (life cycle analysis).

As discussed in the response to 1.2a, the government needs a blueprint defining how much LCLF capacity they need into the future, supporting which industries and over what time horizons. This work will help determine the prioritisation of project types and technologies.

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Question 3.1b: How can nascent production pathways compete with more-established production pathways (e.g. HEFA and HVO)?

The EU has introduced a temporary suite of "double count" policies to give certain nascent technologies (or feedstocks) such as e-fuels a temporary leg up in their early stages of development. A similar system could be provided in Australia to support nascent pathways.

Question 3.1c: What minimum stage of project development (and evidence) should be expected by projects under the program?

Projects should have a credible, strong line of sight to FID, however recognising that FID for first of a kind projects will often be contingent on receiving government support, and so flexibility should be granted within the scheme to allow for this.

Question 3.2: Should there be a minimum facility size to be eligible?

As discussed in the response to 1.2a, the government needs a blueprint defining how much LCLF capacity they need into the future, supporting which industries and over what time horizons – this work will help determine the scale and size of project types and technologies to be supported. If these policies are also going to materially contribute to national security and national decarbonisation targets, scale will be necessary, for example we would suggest projects sized less than 50M litres of fuel with a CI abatement of <65% versus fossil fuel as being out of scope.

Question 3.3: Should LCLF be required to meet a carbon intensity threshold (% carbon intensity reduction compared to fossil equivalent) to be eligible for the program? If yes, what would be a reasonable threshold, and how should that threshold be calculated and verified? If not, why not?

[redacted] agrees with the need for a minimum decarbonisation hurdle, otherwise there is a risk of creating a more costly energy source with minimal decarbonisation benefits. EU Renewable Energy Directive has stated >65%, which seems to strike the right balance between ambition and pragmatism.

Question 3.3a: If the production incentive is based on carbon emissions reduced, rather than volume of LCLF produced (see Question 2.3), is a minimum carbon intensity threshold still needed as part of the eligibility criteria?

See 3.3.

Question 3.3b: Should Indirect Land Use Change be included in the method for determining carbon intensity, for the purpose of the Program?

Yes. The consideration of indirect land use change (ILUC) should be included and should be informed by the following principles

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- Incorporate globally-accepted, scientifically defendable land use change accounting methods in the calculation of carbon intensity: maintaining the global credibility of Australian LCLF products and preventing perverse incentives driving land-use change with adverse greenhouse gas emissions outcomes.
- Recognition of waste and residue feedstocks: ensuring residue-based products receive appropriate credit for their circular economy benefits and accretive economic value to Australia (by this we are referring to the additional economic value of monetising waste, which can be significant)
- Robust alignment with existing international and national frameworks: e.g. building interoperability with EU RED II, ISCC, CORSIA, or IMO GFI to secure export access for Australian projects, and / or deployment into international-scope industries such as deep-sea shipping and aviation

Question 3.3c: Should any feedstocks be prioritised or otherwise considered out of scope?

As mentioned in 3.3b, waste and residue feedstocks should be prioritised / incentivised, ensuring residue-based products receive appropriate credit for their circular economy benefits and accretive economic value. Where they are commercially viable, e-fuels derived from renewable electricity as a "feedstock" should also be considered for prioritisation given their potential to unlock material scale in the LCLF industry.

Question 3.4: Other than carbon intensity, should any other sustainability criteria be included?

Core criteria should include other key social license considerations such as biodiversity, environmental damage, pollution (other than carbon), safety and human rights.

Question 3.5: Which international and domestic sustainability schemes should be allowed to verify sustainability claims?

ISCC, RSB, Guarantee of Origin, ICAO /CORSIA and any prevailing maritime scheme to used for IMO compliance.

Other policy considerations (Q4.1 - Q4.6)

Question 4.1: What are your views on the following factors affecting the merit of a proposal?

[redacted] agrees with all of the factors listed above; we would also emphasise that delivering "bankable" projects to FID needs to be a key consideration for all applications, without this there is a risk that no projects actually make it into operation under the scheme.

[redacted]

Question 4.2: Recipients under the Program will need to deliver benefits according to the Community Benefit Principles under the Future Made in Australia Act (see Appendix D of the Policy Design and Engagement Paper). How do you consider the Community Benefit Principles in relation to LCLF projects? Are there specific Community Benefit Principles that are more or less relevant?

No. All of the existing community benefits under the act are consistent with our view of what should be assessed.

Question 4.3: How will overseas policy developments interact with domestic policy settings to support projects reaching final investment decisions? For example, LCLF demand-side targets or mandates, and international frameworks such as the International Civil Aviation Organisation long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050.

International frameworks may be very relevant, especially if they enable large-scale offtake contracts to be committed to Australian projects for export. Although there have been some delays to the implementation of global frameworks under IMO and ICAO, if and when these global demand mandates are implemented Australian regulators should be wary that these have the potential to use up all available capacity in Australia's LCLF project pipeline, leaving no remaining volumes for Australian domestic decarbonisation or for National Security imperatives. Our response to question 2.9 offers a potential solution to promote and link domestic production to domestic objectives.

Question 4.4: In addition to production support, what other measures are considered critical to achieve final investment decisions for projects? What are their key features?

1. Demand side mandates have been discussed extensively in responses to prior questions, and are a critical element to ensure projects can attract investment and reach FID.
2. A LCLF carbon certification / attestation scheme (e.g. Guarantee of Origin) which is aligned with international schemes and considers land use change in its calculation of fuel carbon intensity is important (for example it would be deficient if the initial proposed LCLF Product Guarantee of Origin scheme does not attribute a land use change metric to carbon intensity values)
3. Fast-tracked planning approvals and regulatory support to ensure projects of national strategic importance reach FID and are built in a timely manner, and do not take decades to reach fruition
4. Politically and legislatively permanent, stable and long-term support schemes which investors can take confidence in and will not be changed or scrapped in the future after implementation

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Question 4.5: What are the intersecting policies you expect need to be considered to unlock a domestic LCLF production industry?

See 4.4.

Question 4.6: Is there any other feedback you would like to provide that isn't covered by questions above?

No