

17 July 2024

Australian Government

Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Department of Climate Change, Energy, Environment and Water

Canberra ACT 2601

Lodged electronically

Re: UQ submission to the consultation on Future Made in Australia: Unlocking Australia's low carbon liquid fuel opportunity.

The University of Queensland (UQ) welcomes the opportunity to provide a submission to the Government's consultation on Low Carbon Liquid Fuels (LCLF). Based on extensive research across multiple sectors, my work has highlighted the pressing need for LCLFs, particularly Renewable Diesel or Hydrotreated Vegetable Oil (HVO), as a vital fossil fuel-free low-emission component of Australia's decarbonisation strategy. The challenges faced by hard-to-abate sectors in transitioning to zero-emission alternatives, coupled with their substantial diesel consumption, underscore the significance of LCLFs like Renewable Diesel.

Our submission aims to address key aspects concerning the adoption and implementation of LCLFs, recognising their potential impact on a wide range of industries:

1. **Harnessing Australia's comparative advantages:** Australia is uniquely positioned to become a global leader in LCLF production due to its abundant renewable energy resources, sustainable feedstocks, and a robust research and innovation ecosystem. Our vast solar and wind potential can support clean LCLF production processes, while extensive agricultural and forestry residues provide a consistent supply of feedstocks. Additionally, Australia's strategic location, close to growing Asian markets, enhances our export potential, making us well-suited for future LCLF production and export.
2. **Implementing effective production incentives:** To develop a competitive LCLF industry, we recommend a multifaceted approach that includes tax incentives, contracts for difference (CfD), and grant-based funding. This strategy will address the current 'green premium' and make LCLFs competitive with conventional fuels. Supporting multiple producers initially will encourage competition and innovation within the sector. We suggest implementing a phased approach to support over 10-15 years, allowing the industry to mature and become self-sustaining. This approach, supported by robust

economic modelling, will help determine appropriate support levels and foster a healthy, competitive LCLF industry.

3. **Designing effective demand-side mechanisms:** Creating strong demand signals for LCLFs is essential. We propose implementing a combination of mandates, low carbon fuel standards (LCFS), and non-binding targets to provide the necessary market signals and incentives for LCLF production and consumption. These mechanisms should be designed to integrate seamlessly with existing policies, stimulate innovation, and create a guaranteed market for LCLFs. For high-impact sectors such as construction, mining, and agriculture, mandating a certain percentage use of renewable diesel in heavy machinery and equipment, supported by targeted incentives and infrastructure investments, will facilitate the transition to low-emission alternatives. In long-haul heavy-duty road transport, renewable diesel serves as a practical low-emission solution for the existing fleet during the transition to zero-emission vehicles; therefore, we recommend providing incentives and support for refuelling infrastructure to promote its adoption. Moreover, aligning new measures with existing climate policies will enhance policy coherence and effectiveness.
4. **Establishing robust emissions and sustainability criteria:** Ensuring the environmental integrity of LCLFs is crucial. We advocate for the implementation of dynamic emissions reduction thresholds and comprehensive sustainability criteria that align with international standards. Setting minimum emissions reductions compared to conventional fuels, with thresholds increasing over time, will promote continuous improvement in LCLF production. Additionally, sustainability criteria should protect biodiversity, water resources, and ensure community benefits, thereby supporting sustainable practices and contributing to environmental conservation and public health.

We believe that a carefully designed combination of supply-side and demand-side policies, supported by robust research and development, will be crucial in establishing a thriving LCLF industry in Australia. The subsequent pages elaborate on specific areas under the inquiry's terms of reference. We appreciate the opportunity to contribute to this critical discussion and look forward to further engagement on this important issue. Good luck with this challenging but important work.

Kind regards,

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Specific areas under the inquiry's terms of reference

1. Australia's Comparative Advantages as an LCLF Producer

Australia possesses significant comparative advantages as a Low Carbon Liquid Fuel (LCLF) producer. Our large landmass and diverse climate zones are suitable for cultivating various feedstocks. We have advanced agricultural practices and established supply chains that can be leveraged for LCLF production. Furthermore, Australia has the potential to integrate renewable energy sources into LCLF production processes, which could further enhance our competitive edge in this sector:

- **Abundant renewable energy resources:** Australia's vast solar and wind potential can provide the clean energy required for LCLF production processes.
- **Feedstock resources:** With substantial agricultural and forestry residues, as well as waste products from various industries, Australia can provide a consistent supply of feedstocks for LCLF production. This includes tallow, used cooking oil, and non-food crops.
- **Established refining infrastructure:** Existing refineries could potentially be retrofitted for LCLF production.
- **Strong research and innovation ecosystem:** Australian universities and research institutions are actively involved in researching LCLFs.
- **Strategic location:** Proximity to growing Asian markets positions Australia well for future LCLF exports.

While Australia has these advantages, we face competition from established producers in the United States and Europe. These producers benefit from supportive policies that drive demand and production, as well as economies of scale in their existing operations. In the short term, Australia is likely to rely significantly on LCLF imports. However, with appropriate policy support and investment, we could transition to a more balanced mix of domestic production and imports in the medium to long term.

2. Options to Support Domestic LCLF Production

We suggest considering a multi-faceted approach to support domestic LCLF production.

i. Production incentive mechanism:

Options such as contracts for difference (CfD), fixed grant amounts, or tax incentives should be evaluated. Each mechanism has its own advantages and considerations:

- **Competitive grants:** Offering grants through competitive bidding processes, such as CfDs, to cover the gap between production costs and market prices. This

mechanism provides targeted support to high-impact projects and fosters innovation.

- **Tax incentives:** Providing production tax credits per litre of renewable diesel produced, with increments for higher life-cycle emissions reductions. This approach ensures broad-based support and incentivises continuous improvement in emissions performance.
- **Research and development support:** Continued funding for innovative LCLF technologies and production pathways is crucial for long-term industry development.
- **Infrastructure support:** Government co-investment in LCLF production facilities and associated infrastructure could help overcome initial market barriers.

The expected rate of support under any scheme would depend on the production pathway and market conditions. Further economic modelling would be required to determine appropriate support levels. To foster a healthy and competitive LCLF industry, we recommend supporting multiple producers, ideally three to five initially. This approach will encourage competition and innovation within the sector. We suggest implementing a phased approach to support over 10-15 years, allowing the industry to mature and become self-sustaining.

ii. Market Insights and Comparative Advantages

While specific data on production costs and sale prices for LCLF in Australia are needed, it is clear that a 'green premium' currently exists due to higher production costs compared to conventional fuels. Addressing this disparity through targeted government intervention will be crucial to making LCLF competitive in the market.

Potential demand for LCLF could reach significant levels by 2030 with appropriate incentives and policy support. Domestic production can be scaled to meet this demand, reducing reliance on imports.

The Australian LCLF industry is nascent but growing, with several pilot projects and small-scale commercial operations. Internationally, the industry is more mature, particularly in Europe and North America, where supportive policies have accelerated growth.

iii. Design of Production Incentives

Different rates of support may be necessary for SAF and renewable diesel due to varying production costs and market dynamics. Emerging technologies should receive higher support to encourage development and commercialisation.

Technology-agnostic policies, such as performance-based incentives and flexible funding mechanisms, will ensure efficient application across new and emerging technologies.

3. Demand-Side Mechanisms

To create strong demand signals for LCLFs, we propose implementing a combination of mechanisms. This could include a mandate introduced over time, coupled with a low carbon fuel standard connected to a trading scheme. These mechanisms would provide clear market signals and incentives for LCLF production and consumption.

i. Mandates, standards and targets:

- **Mandates:** Introducing mandates can create a guaranteed market for LCLFs. For example, requiring a certain percentage of fuels used in aviation or heavy construction machinery to be LCLFs could stimulate demand. However, mandates should be designed to be flexible to avoid disproportionate impacts on different sectors and to allow businesses time to adapt.
- **Low Carbon Fuel Standard (LCFS):** An LCFS could set progressively stringent carbon intensity reduction targets for fuels. This approach allows fuel producers the flexibility to choose how they meet the standards, encouraging innovation. LCFS programs in California have been successful in reducing carbon intensity and could serve as models for Australia.
- **Non-Binding Targets:** Setting voluntary targets for LCLF use can encourage industry participation without the regulatory burden. These targets can be complemented with incentives for companies that achieve or exceed the targets.

ii. Sector-Specific Strategies:

- **Construction, Mining and Agriculture:** Mandate a certain percentage use of renewable diesel in **heavy machinery and equipment**, supported by targeted incentives and infrastructure investments. Given the significant diesel consumption and challenges in transitioning to zero-emission alternatives, renewable diesel offers an immediate and practical solution. It can be seamlessly integrated into existing fleets without requiring modifications, ensuring minimal disruption. Additionally, focusing on boosting domestic production of renewable diesel is crucial to address supply chain shortages and reduce costs associated with imports. Investments in local production facilities and feedstock supply chains will enhance energy security and economic resilience.
- **Long-haul Heavy-Duty Road Transport:** Encourage the use of renewable diesel in heavy-duty trucks by providing incentives and support for refuelling infrastructure. Renewable diesel serves as a crucial **transitional fuel**, offering

immediate reductions in GHG emissions for existing fleets without the need for engine modifications. This ensures a practical and cost-effective pathway to decarbonisation while we work towards broader adoption of zero-emission technologies.

- **Edge Use Scenarios:** Invest in research and development for electric-biofuel range extender technology, specifically targeting vehicles used in remote locations and disaster response scenarios. This technology enhances operational flexibility and resilience, providing a reliable and sustainable energy solution where traditional electric charging infrastructure may be limited or unavailable.

iii. Considerations for Design and Implementation:

- **Interaction with existing policies:** Ensure that demand-side measures align with the Safeguard Mechanism and other climate policies to avoid overlap and regulatory conflicts. This alignment can enhance policy coherence and effectiveness.
- **Sector-specific impacts:** Tailor demand-side measures to account for sectoral differences. For instance, the aviation sector might need longer lead times and higher incentives compared to road transport due to technological and infrastructure constraints. A sectoral analysis should be conducted to identify specific needs and design appropriate measures.
- **Competition effects:** Evaluate how demand-side measures could affect market competition. Measures should be designed to prevent monopolistic practices and ensure a level playing field. For example, small and medium-sized enterprises (SMEs) might need targeted support to compete with larger firms.
- **Domestic vs. imports:** Balance the promotion of domestic production with the use of imports to meet immediate demand. Initial reliance on imports can help bridge supply gaps while domestic production capacity is built. Measures could include temporary import tariffs or quotas to protect nascent domestic industries.
- **Impact analysis and monitoring:** Conduct regular impact assessments to monitor the effectiveness of demand-side measures and make necessary adjustments. Key performance indicators (KPIs) could include LCLF market share, carbon intensity reductions, and economic impacts on various sectors.

By implementing these detailed and targeted demand-side mechanisms, the Government can create a robust and sustainable market for LCLFs, driving innovation and investment in the sector while ensuring environmental and economic benefits.

4. Emissions and Sustainability Criteria

We support the inclusion of an emissions reduction threshold as part of the eligibility criteria for LCLF support. Considerations could include:

- **Initial Threshold:** A minimum emissions reduction compared to conventional fuels, with the specific percentage to be determined based on further analysis and industry consultation.
- **Increasing Thresholds:** The possibility of the threshold increasing over time to drive continuous improvement in LCLF production.
- **Additional Incentives:** Consideration of a sliding scale of support based on emissions reductions above the minimum threshold to encourage producers to maximise environmental benefits.

Sustainability criteria could include factors such as land use changes, water usage, biodiversity protection, and social impacts. We recommend aligning these criteria with international standards where possible.

- **Land use and biodiversity:** Ensure that feedstock production does not lead to deforestation, habitat loss, or negative impacts on biodiversity.
- **Community benefits:** Prioritise projects that provide economic and social benefits to local communities, particularly in regional areas.
- **Water and soil health:** Implement practices that protect and enhance water quality and soil health, ensuring long-term agricultural sustainability.

LCLF production in Australia offers numerous community benefits, including job creation, regional economic development, and enhanced energy security. Sustainable practices also contribute to environmental conservation and public health.