

SUBMISSION

Submission to the Department of Climate Change, Energy, the Environment and Water

Submission to the consultation into Securing Australia's Cleaner Fuels Industry: Demand Mechanism consultation paper

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The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

Diesel fuel remains the dominant energy source powering Australia's mining, road transport and agriculture sectors, with these 3 sectors accounting for 88% of all diesel use (Denis-Ryan, 2026). It supports critical machinery, transport vehicles and infrastructure essential to the nation's economy and exports. However, this reliance on diesel comes with significant environmental, health, economic and strategic risks. Diesel combustion contributes approximately 17% of Australia's total carbon emissions, posing a major obstacle to meeting the country's climate targets of a 43% reduction by 2030, 62-70% by 2035 and net zero emissions by 2050. Australia imports 87% of its diesel (nearly 29 billion litres annually), reflecting a heavy dependence on international fuel markets and diminishing domestic refining capacity (Denis-Ryan, 2026). This reliance presents national security vulnerabilities due to geopolitical risks and potential supply chain disruptions.

As demonstrated in ATSE's [Decarbonising Diesel Industries](#) report, key alternatives to diesel include low-emission biofuels, electrification and hydrogen. Biofuels have the advantage of being the simplest to deploy, without major infrastructure modifications. ATSE's industry survey ranked biofuels as the most suitable replacement for diesel (ATSE, 2025). They can therefore help to rapidly reduce emissions, particularly in remote areas where infrastructure availability can constrain electrification or hydrogen adoption.

Australia's biofuels industry is underdeveloped and would benefit from regulatory changes that encourage greater domestic production. Australia produces significantly less biofuel than it uses and relies on imports from other countries. Biofuels imported into Australia are often made from canola grown here – with 90% of canola grown in the Esperance region being exported to the European Union to make biodiesel (Ward, 2026). Local production of canola-based fuels would reduce transport in both directions and support local industry. Similarly, where diesel cannot be replaced by low-carbon alternatives, local production of diesel has lower total emissions than imports that require significant transportation-based emissions.

To build a strong low-carbon liquid fuels (LCLF) sector, Australia will need to overcome an investment gap in new refining facilities and ensure that LCLF produced in Australia is commercially competitive while delivering real reductions in emissions intensity. Supporting industry through the transition will be vital to build a demand base that enables investment in local LCLF production.

To support building a demand mechanism for LCLF, ATSE makes the following recommendations:

Recommendation 1: Create a dedicated Future Fuels Strategy aligned with Australia's net zero goals.

Recommendation 2: Review the Fuel Tax Credit Scheme and use the 2026-27 Safeguard Mechanism Review to phase out diesel incentives and promote low carbon liquid fuels.

Recommendation 3: Reintroduce ACCUs for activities that lower land, sea and air transport emissions.

Recommendation 4: Develop mandates for LCLF beyond just aviation, as proposed in the discussion paper, to shipping in line with international best practice.

Recommendation 5: Invest in early-stage research and development for LCLF technologies to develop the next generation of LCLF.

Recommendation 6: Use public co-investment to help de-risk and accelerate first-of-a-kind LCLF projects and create stronger market confidence.

Developing a strategy to accelerate the adoption of LCLF

Electrification had long been the priority for reducing emissions from combustible fuels, with a combination of electrification and renewable energy able to effectively eliminate operational emissions. However, electrification relies on significant energy generation, storage, and transmission infrastructure, and requires retrofitting or replacing equipment and vehicles. In land transport, heavy batteries and vehicle weight limits result in reduced carrying capacity that, in some applications, can make electrification undesirable (Climateworks, 2023). These factors have made fuel switching to low-carbon fuels the primary option for most of the world (International Energy Agency, 2023). State Governments in Australia have responded with biofuel strategies announced in [New South Wales](#) and [Western Australia](#). The current consultation and the recently released [National Bioenergy Feedstock Strategy](#) by the Department of Agriculture, Fisheries and Forestry are important steps in the right direction at a national level.

ATSE supports establishing a national Future Fuels Strategy, in the same vein as the [Future Gas Strategy](#), aligned with Australia's net zero goals. This Strategy should be backed by clear governance mechanisms and support to increase the availability and uptake of LCLF and support Australia's fuel security. This should include clarifying the roles and responsibilities of the various state, territory and federal agencies and developing accountability mechanisms.

The Strategy should also set clear targets for CO₂-e/MJ of energy produced for all fuel used in Australia. This calculation should include the life-cycle emissions embedded in the transport and production of fuels, particularly for facilities overseas or not covered by the Safeguard Mechanism. These targets could support a progressive increase in fuel blending – combining diesel with certified biofuels – as production capacity rises and support local production. The strategy could also measure success by setting milestone metrics for increased LCLF production capacity, LCLF costs, and progress on developing new technologies that support LCLF.

Recommendation 1: Create a dedicated Future Fuels Strategy aligned with Australia's net zero goals.

Reviewing incentives for fuel use

For LCLF uptake to be significant across the economy, the price point for these fuels needs to be equal to, or cheaper than, diesel. Achieving this will require both establishing large-scale, low-cost LCLF production in Australia and building demand to support economies of scale for these facilities. The Australian Government has powerful levers to increase demand for LCLF by adjusting existing policy mechanisms, particularly the Fuel Tax Credit Scheme and the Safeguard Mechanism.

Currently, the Australian Government provides rebates on tax paid for diesel used in heavy vehicles and non-road equipment (Terrill et al., 2023). Since 2006-07, the Fuel Tax Credit Scheme has reduced diesel costs for businesses by around \$122.7 billion (Pollard & Buckley, 2025). This makes it more difficult for new fuel sources to be cost-competitive, disincentivising a transition to LCLF options. ATSE's report *Decarbonising Diesel Industries* proposed three options to address this issue: phasing out the fuel tax credit scheme, reducing or limiting it to certain sectors, or capping the scheme and introducing a transition tax incentive. The third option would allow companies to receive the tax credits but require them to invest in defined decarbonising activities. This option could shift the cost-benefit analysis away from high-emission diesel fuels towards LCLFs.

Another demand-side option for LCLFs (proposed in consultations for *Decarbonising Diesel Industries*) is to strengthen the Safeguard Mechanism. The Productivity Commission has already recommended expanding the Safeguard Mechanism by lowering the emissions threshold to 25,000 tonnes of CO₂ equivalent emissions per year (Productivity Commission, 2025). Lowering the threshold would see a much greater number of businesses required to act to reduce their emissions or to buy carbon credits, significantly improving the cost-competitiveness of low emissions fuels. The Government should therefore review the Safeguard Mechanism to reduce the threshold to a level that better incentivises the transition from diesel to LCLF.

Recommendation 2: Review the Fuel Tax Credit Scheme and use the 2026-27 Safeguard Mechanism Review to phase out diesel incentives and promote low carbon liquid fuels.

Supporting the uptake of LCLF in aviation and shipping

The transport sector accounts for nearly one-fifth of Australia's emissions profile (Cheung et al., 2023). While there are emerging low emissions options for most land transport, air and sea transport, in particular, are considered particularly hard to abate. Previously, the Clean Energy Regulator used to incentivise transitioning to lower-emission fuels by allowing land and sea transport to earn Australian Carbon Credit Units (ACCUs) for activities that reduced fuel emissions (Clean Energy Regulator, 2025). This included replacing or retrofitting vehicles, changing energy source mixes or improving operational practices, but this method expired in March 2025 under sunset provisions. A similar aviation method that encouraged switching to biofuels also expired in 2025 (DCCEEW, 2026b).

These methods have expired as international mandates and incentives increase. For example, the European Union and the United Kingdom have both introduced mandates for sustainable aviation fuels that commenced with 2% sustainable aviation fuel mandates in 2025 and rising over the coming decades to 70% by 2050 in the European Union (European Commission, 2026; UK Department of Transport, 2024). In shipping, the International Maritime Organization has established a net zero framework which sets new fuel standards. While the adoption of the framework has been delayed, it is intending to require 97% of the world's merchant shipping by tonnage to reduce their emissions intensity over time (International Maritime Organization, 2025).

These methods were allowed to sunset due to relatively low uptake (DCCEEW, 2026a). However, combining these ACCU methods with increasing global mandates for LCLFs could help to encourage transport companies to move ahead of mandates and would help build demand to support an Australian LCLF industry. Combining these with local mandates for aviation and shipping, in line with the emerging international best practice, could strengthen this.

Recommendation 3: Reintroduce ACCUs for activities that lower land, sea and air transport emissions.

Recommendation 4: Develop mandates for LCLF beyond just aviation, as proposed in the discussion paper, to shipping in line with international best practice.

Supporting technological adoption of lower-emission alternatives

(Cheenkachorn et al., 2013; van Heerden et al., 2021)(Juknelevicius et al., 2019) Early-stage R&D is essential to addressing the technical challenges that currently prevent zero-emissions technologies from replacing diesel in heavy-duty and remote applications. Early-stage innovation in advanced biofuels offers a solution for sectors where full electrification or hydrogen is not practical. Fuels derived from agricultural waste or carbon capture could be used as drop-in replacements for diesel. However, these fuels face challenges in feedstock availability, conversion efficiency, and production cost. Continued research into agronomic practices, such as trials of new biofuel crops and novel rotation strategies, is needed to improve feedstock reliability and yield (AgriFutures, 2022; Whittaker, 2025). Australian expertise in this area could play a critical role in advancing globally scalable solutions.

For technologies that have been shown to be technically viable, a gap exists that makes it difficult for technologies to reach the market and scale up. Many projects get stuck in the pilot phase, with limited market confidence and upfront costs hampering progress. An Australian deployment strategy would bridge this gap. This could include public co-investment in large-scale pilots, government procurement to create stable demand, and targeted infrastructure investment in charging and refuelling corridors. Stronger regulatory signals, such as performance standards or fleet mandates, would also give industry the certainty needed to invest.

Recommendation 5: Invest in early-stage research and development for LCLF technologies to develop the next generation of LCLF.

Recommendation 6: Use public co-investment to help de-risk and accelerate first-of-a-kind LCLF projects and create stronger market confidence.

ATSE thanks the Department of Climate Change, Energy, the Environment and Water for the opportunity to respond to the consultation into securing Australia's Cleaner Fuels Industry. For further information, please contact academypolicyteam@atse.org.au.

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