3 National Bioenergy Feedstock Strategy

A Submission to the Australian Department of Agriculture, Fisheries and Forestry

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1. Introduction

Decarbonising Australia's transport sector is fundamental to meeting national emissions goals while safeguarding economic competitiveness. Low-carbon liquid fuels (LCLFs) – including sustainable aviation fuel (SAF) and renewable diesel – are central to this transition. Many hard-to-abate transport modes such as long-haul trucking, aviation, marine freight, and bulk rail will rely on energy-dense liquid fuels for decades to come. LCLFs enable significant emissions reductions from these sectors without constraining freight productivity, long-distance connectivity, or supply chain resilience. This is particularly relevant in Australia, where vast distances, regional supply chains, and export-oriented industries demand reliable and efficient long-range transport solutions.

The success of LCLFs requires a holistic systems approach addressing logistics, infrastructure, and policy. Efficiently moving biomass feedstocks from farms and waste streams to processing hubs, and onward through storage, blending, and distribution networks to end-users, is critical. Globally, the cost of moving and handling feedstocks can account for a

substantial share of the total production cost of fuels like SAF[1]. Inefficiencies in transport links, storage capacity, or regulatory alignment raise costs, increase lifecycle emissions, and risk under-utilisation of production facilities. Aligning biofuel production investment with logistics capacity, industrial land use planning, multimodal freight networks, and demand certainty will establish a resilient and competitive domestic industry, consistent with the objectives of the National Bioenergy Feedstock Strategy (NBFS).

The Australian Logistics Council (ALC) brings a unique operational perspective to this discussion. As the peak body representing Australia's end-to-end freight system – encompassing road and rail operators, ports, airports, intermodal terminals, major fuel distributors, agribusiness, and retail supply chains – ALC members operate the networks through which LCLFs, and feedstocks must move. ALC welcomes the opportunity to contribute this expertise to policy development, ensuring that settings reflect operational realities and accelerate the transition to clean fuels while strengthening national supply chain competitiveness.

2. Logistics as the Foundation of Bioenergy Success

Digital traceability and data integration are increasingly critical in fuel supply chains. Modern fuel markets, especially for export or airline use, require verifiable sustainability credentials, tracking feedstocks from origin to final delivery. Certification systems such as Guarantees of Origin, and compliance frameworks like CORSIA[2] under the ICAO, are prerequisites for international market access and investor confidence. Integrated digital platforms enable optimisation of routing and modal choices in real time, monitor lifecycle emissions, and provide transparent reporting to purchasers. Such systems reinforce supply chain integrity and demonstrate emissions reductions to domestic and global customers.

Importantly, Australia is not starting this journey from scratch. Recent trials and projects indicate that existing infrastructure can accommodate LCLFs when supply chains are well-planned and coordinated. For example, in 2025 Qantas, Ampol, and Sydney Airport collaborated on the country's largest trial importation of SAF, moving nearly two million litres of fuel through established fuel terminals and airport hydrant systems[3]. The success of this pilot demonstrated the capability of current infrastructure to handle SAF without major modifications, so long as the product is available, and the hand-offs are managed properly. Likewise, feasibility studies by major fuel companies, including BP's planned Kwinana biorefinery, illustrate how biofuel production can integrate with pipelines and ports[4]. Scaling from trials to a national industry will require systematic integration of logistics, infrastructure planning, and market design.

3. Managing Supply-Chain Complexity in the Australian Context

Industrial land availability is a particularly acute constraint. Facilities for pre-processing biomass, bio-refineries, blending and storage terminals, and associated loading infrastructure must be sited in locations where feedstocks can be collected, and products distributed efficiently. Yet many of these ideal sites – near ports, rail heads, or logistics hubs – face competing land use pressures and rising land values. As highlighted in ALC submissions to state industrial land use strategies, protecting key freight precincts (for example, around Brisbane's port and rail terminals or Western Sydney's logistics hub) is critical not only for bioenergy, but for overall supply chain efficiency. These precincts need planning protection and development support to ensure sufficient space for new tank farms, rail sidings, or processing plants that will be required as the bioenergy industry grows. Integrated land-use planning that designates and preserves "bio industrial" zones near transport infrastructure will pay dividends by minimising the distance and complexity in moving materials from farm gate to fuel pump.

Another layer of complexity is regulatory fragmentation across jurisdictions. Inconsistent freight regulations between states – including differences in heavy vehicle mass and dimension limits, permit requirements for oversized or dangerous goods loads, and restrictions on coastal shipping – compound operational risks and inefficiencies. A truck carrying a load of woody biomass or used cooking oil might be allowed a certain weight or trailer length in one state but face different limits across the border, leading to suboptimal loading or the need for break-of-bulk at borders. Likewise, differing permit processes for transporting flammable liquids or agricultural waste can slow down cross-border supply chains. Coastal shipping, which could be an efficient mode for moving liquid fuels around our long coastline, is presently hampered by regulatory and cost barriers that vary between domestic and international rules. National harmonisation of freight

[1] https://www.spglobal.com/commodity-insights/en/news-research/latest-news/agriculture/060525-global-saf-supply-to-fall-23-million-mt-short-of-demand-by-2035skynrg#:~:text=By%202030%2C%20global%20SAF%20demand,mandates%20and%20voluntary%20airline%20targets

[2] https://www.icao.int/CORSIA

[3] https://www.qantasnewsroom.com.au/media-releases/australias-largest-import-of-sustainable-aviation-fuel-lands-in-sydney/#:~:text=This%20import%20demonstrates%20the%20capability,backed%20by%20the%20national%20carrier

[4] https://www.reuters.com/business/sustainable-business/bp-aims-start-producing-green-jet-fuel-australia-by-2025-2022-07-14/#:~:text=BP%20aims%20to%20start%20producing,Nation%2C%20Qantas

regulations is essential to reduce these frictions and support the specialised asset investments that a biofuel supply chain will need. Through mechanisms like the National Heavy Vehicle Regulator (NHVR) and cooperative state agreements, Australia should strive for uniform standards giving investors and operators the confidence that if they build a supply chain spanning multiple states, it will function predictably and efficiently.

4. Infrastructure, Tankage, and Fuel Handling Capability

Successfully integrating LCLFs into the national fuel mix will require substantial new infrastructure, much of it highly specialised. This includes storage tankage designed to handle multiple fuel streams (e.g. segregating biofuels from petroleum during transport and blending), dedicated blending facilities with accurate metering and quality control, modifications to pipelines and hydrant systems, and multimodal transfer points for moving feedstock and fuel between trucks, trains, ships, and pipelines. These capital investments are significant. However, strategic co-location and design can reduce both cost and risk. For example, placing new biofuel storage and blending facilities adjacent to existing fuel import terminals or refineries can leverage shared pipelines and dock infrastructure. Similarly, installing biofuel tanks and mixing equipment at rail-connected depots inland allows bulk rail delivery of either feedstock or finished fuel, reducing the number of long-distance truck movements required and cutting overall emissions from transport.

Current industry players are already beginning to invest in such infrastructure. Major fuel companies have announced upgrades to tank farms to handle bio-blends, logistics operators are exploring adding intermodal capacity for biomass (such as containerised transport of wood pellets or oils), and some disused pipeline routes (for instance, connecting former refinery sites) are being considered for repurposing to carry biofuels. Yet given the nascency of the industry, government co-investment and support will be critical to de-risk early projects. Public funding or incentives can help secure land for facilities in strategic locations or contribute to the upfront cost of building shared infrastructure like port berths or pipeline links that multiple biofuel producers might use. This kind of partnership will accelerate deployment by enabling infrastructure to be built ahead of full private demand, so that as production ramps up the logistics network is ready to accommodate it.

A sensible first step would be a national feedstock-logistics mapping exercise. This would take a data-driven approach to overlaying where and when feedstocks are available (accounting for seasonal harvests and regional waste generation) with existing transport capacity and infrastructure constraints. By mapping biomass supply "hotspots" against road, rail, and port networks, and identifying gaps or bottlenecks, policymakers and investors can prioritise the most critical infrastructure upgrades. For instance, if a certain region has abundant agricultural residues but no nearby freight rail line or only minor roads, that area would face higher costs to participate in biofuel supply chains – suggesting a need for investment in better connections or perhaps locating a preprocessing hub there to densify the material. Such a mapping can also inform industrial land use decisions, highlighting where land should be set aside near freight corridors for future bioprocessing facilities or transfer depots. Integrating data on seasonal supply spikes (e.g. a glut of feedstock right after harvest) helps plan for storage capacity that smooths out the supply to refineries year-round. Overall, a comprehensive national map of feedstock logistics would strengthen investor certainty by demonstrating that Australia is systematically planning an end-to-end supply chain, not just isolated refineries in a vacuum.

To coordinate these efforts, establishing a dedicated National Feedstock-Logistics Taskforce could provide ongoing strategic oversight. This taskforce – comprising representatives from government (across transport, agriculture, energy portfolios) and industry (fuel producers, freight and logistics operators, farmers) – would align infrastructure planning with supply chain capability and gateway operations. It could, for example, plan the build-out of pipeline connections between a new biorefinery and a port or set standards for fuel handling and safety that are harmonised nationally. By having a focused body looking at the complete system, Australia can ensure that as the bioenergy industry scales, its logistical backbone is being built in tandem and in the right locations.

5. Market Design, Demand Certainty, and Policy Measures

Policy design should be technology-neutral and feedstock-agnostic within the LCLF sphere, so that innovation is encouraged, and regional advantages are leveraged. Australia has diverse feedstock resources – from agricultural oils to municipal solid waste to novel feedstocks like algae – and it is not yet clear which will prove most competitive or sustainable at scale. A broad-based approach (like setting a performance-based low-carbon fuel standard or providing incentives per tonne of CO_2 abated) allows multiple pathways to develop in parallel. This avoids picking winners too early and lets market forces identify the best solutions for each region (for instance, one area might focus on canola-based renewable diesel while another develops woody biomass-to-jet fuel). Technology neutrality also invites complementary solutions, such as co-processing bio feedstocks at existing oil refineries or integrating hydrogen derived fuels in the future, ensuring Australia can adapt as technologies evolve.

Demand-side measures should complement the substantial supply-side incentives the government is already deploying. The Cleaner Fuels Program and related funding initiatives are pivotal to jump-start LCLF production. To maximise the return on that investment, however, there must be simultaneous policies ensuring those new plants have customers for their product. Blending mandates have been effective internationally – for example, the European Union's newly adopted SAF mandate will require 6% of jet fuel to be sustainable by 2030 and 70% by 2050. This kind of clear signal is driving huge investment in SAF capacity in Europe and sending airlines and fuel providers into action. Likewise, the United States is using tax credits and procurement (such as the military committing to buy SAF) to stimulate production. Australia can draw lessons from these examples: a moderate, gradual blending mandate for SAF and/or renewable diesel, combined with targeted support like a well-designed carbon credit market or contracts-for-difference to buffer producers against the initial price premium, would greatly enhance demand certainty. Public sector procurement is another lever – for instance, requiring or incentivising the use of renewable diesel in Defence vehicles, emergency services, or government freight contracts, and a certain percentage of SAF in government-related air travel, would create an early assured market.

6. Mode-Specific Considerations

While a systems approach is vital, each transport mode presents distinct barriers and opportunities for integrating low-carbon fuels. A nuanced, mode-by-mode analysis ensures that policy and industry actions can be tailored to on-the-ground realities in each sector.

6A. ROAD FREIGHT

Road freight is the backbone of first mile and last-mile logistics for bioenergy, and it will also be a major consumer of renewable fuels itself. Heavy road transport faces operational barriers in adopting LCLFs, but also presents significant opportunities. A key challenge is the strain on road infrastructure and the regulatory environment in which trucks operate. Urban congestion and curfews restrict delivery hours, often pushing operations into the night, which can result in suboptimal scheduling. Ageing infrastructure – such as bridges with weight limits or rural roads not designed for frequent heavy truck traffic – further constrains access for high-capacity vehicles that would ideally transport bulky feedstocks. Certain bio-feedstocks and fuels, such as used cooking oil or ethanol, may be classified as dangerous or flammable goods, triggering additional driver training, vehicle signage, and route permit requirements. These compliance obligations, combined with inconsistencies across jurisdictions, add cost and complexity to road logistics.

As noted in Section 3, inconsistent vehicle regulations across jurisdictions remain a barrier to efficient freight movement. Harmonised national standards would enable the wider use of high-capacity vehicles across biofuel corridors.

Despite these challenges, road freight offers immediate pathways for decarbonisation and operational flexibility. Renewable diesel, as a drop-in fuel for existing diesel engines, allows trucking fleets to reduce emissions without waiting for new vehicles or infrastructure. Road vehicles are particularly suited to collect dispersed feedstocks from farms and facilities, and digital tools such as route optimisation software, GPS tracking, and marketplaces for backhaul loads can minimise empty kilometres. Co-locating biofuel blending facilities or depots with existing trucking depots further streamlines distribution—for example, on-site renewable diesel tanks can be supplied by tanker trucks during off-peak hours to avoid urban congestion.

Policy measures to support road freight include targeted investments in critical freight infrastructure, such as road widening and strengthening, to handle increased biomass volumes, as well as workforce development to meet growing dangerous goods certification needs. Easing access restrictions for lower-emission vehicles—for instance, granting longer operating hours for quiet, cleaner trucks—can encourage uptake while mitigating community impacts. With the right regulatory settings, infrastructure investment, and efficiency improvements, road freight can remain the workhorse that connects the bioenergy supply chain, delivering reliable service with substantially reduced emissions.

6B. RAIL FREIGHT

Rail freight offers a low-emission, high-volume solution for transporting bulk feedstocks, intermediates, and finished biofuels over long distances. Steel wheels on rail are far more energy-efficient per tonne-kilometre than road transport – a train can move a tonne of freight with up to sixteen times less emissions than a truck per km[5]. This makes rail particularly suited to handle the heavy logistics demands of a scaled biofuel industry. Challenges primarily relate to connectivity, access, and infrastructure. Many feedstock production areas, such as farms or forestry plantations, and some emerging biorefinery sites are not directly served by rail, requiring trucks to collect materials to the nearest railhead and deliver them from the destination rail terminal. Strategic investment in intermodal facilities – where containers, tanker wagons, or

[5] https://austlogistics.com.au/wp-content/uploads/2025/01/Submission-250131-2025-26-Pre-Budget-2.pdf

hopper cars can be efficiently transferred between trucks and trains – is therefore essential. Upgrading or adding terminals in key regional locations would extend the reach of the rail network into agricultural and resource-rich areas.

Access to rail paths and flexibility also pose challenges. Australia's rail freight network is a mix of vertically integrated lines and open-access interstate tracks. Bio-refineries or farmer cooperatives need predictable, affordable access, but restrictive pricing or limited train slots can hinder participation. Long-term, transparent access agreements for bioenergy freight would encourage operators to invest in specialised rolling stock, such as ethanol tank cars or dedicated biomass hopper wagons. Some lines may require upgrades or maintenance to handle heavier or more frequent trains, which could be co-invested in by government to support growing volumes.

Despite these barriers, rail offers significant opportunities. It is ideal for bulk, long-haul movements, such as transporting feedstock from grain regions or timber plantations to coastal refineries or moving finished fuels to distribution depots. A single freight train can replace dozens of trucks, easing highway congestion, lowering accident risk, and reducing fuel use. Even a small modal shift from road to rail could yield substantial savings – one study estimated that a 1% shift of freight to rail in Australia could cut accidents, emissions, and health costs by around $71.9 million annually[6]. Proactive planning could position bioenergy as a catalyst for such modal shifts. Rail's own decarbonisation potential further enhances its value. Most freight locomotives run on diesel, and full electrification remains unlikely in the near term. Renewable diesel offers a drop-in solution, while hybrid locomotives or battery-assisted engines could further reduce emissions. Coordinated investment, such as upgrading rail fuel depots to stock renewable diesel, would enable rail to support biofuel supply chains while lowering its own carbon footprint. New corridors like Inland Rail, connecting Brisbane to Melbourne, present opportunities to site biorefineries or feedstock processing centres along the route, maximising rail's efficiency from day one.

In summary, rail can underpin efficient, sustainable bioenergy logistics if connectivity gaps are addressed, access is fair and predictable, and targeted investments in infrastructure, rolling stock, and fuel solutions are made.

6C. PORTS AND COASTAL SHIPPING

Australia's ports serve as critical nodes for importing feedstocks and exporting or distributing finished biofuels. Many LCLFs, particularly SAF and renewable diesel, will likely be produced or blended near port areas, reflecting the need to import certain inputs or export products to international markets. However, ports face constraints that could become bottlenecks for scaling LCLFs.

Land scarcity within port precincts is a primary challenge. Port land is highly sought-after, especially in capital cities surrounded by urban development, and establishing biofuel storage tanks, blending facilities, or feedstock handling areas—such as a terminal to receive and shred agricultural waste delivered by ship—requires secure space with appropriate zoning. Without early planning, bioenergy projects risk locating off-site, adding handling steps such as piping or trucking fuel to the port, which increases costs and complexity. Safeguarding dedicated industrial land for alternative fuel facilities is therefore a key policy priority, potentially involving port authorities and governments identifying areas for future fuel terminals and preventing encroachment by incompatible uses.

Berth congestion and operational readiness add further complexity. Periods of congestion already occur at some ports, where vessels queue for a berth, and introducing additional biofuel traffic could strain ports without sufficient berthing capacity or scheduling optimisation. Not all ports have the necessary equipment to handle bioenergy cargo; for example, liquid biofuels may require dedicated pipelines from berth to storage, loading arms suited to different fluid properties, or fuel quality laboratories for testing batches. Regulatory complexity compounds these challenges, as biofuel storage and handling may trigger environmental, safety, and biosecurity requirements involving multiple agencies. Streamlining approvals and clarifying regulatory responsibilities will be essential to prevent delays in project development and attract private investment.

Despite these challenges, ports offer substantial opportunities for Australia to become a regional biofuel leader. With increasing demand for SAF and renewable diesel across the Asia–Pacific, ports can serve as launch points for export. Coastal shipping can complement this by moving biofuels domestically in bulk, for example transporting renewable diesel from a Queensland biorefinery to Sydney or Melbourne more efficiently than long-haul trucking. A hub-and-spoke model could allow large volumes produced in one location to supply other cities or remote regions, with coastal vessels reducing pressure on road and rail corridors. Policy support—such as reviewing cabotage restrictions, incentivising domestic shipments, and ensuring berth slots for coastal trade—would be needed to realise this potential.

A coordinated approach is essential to enable ports as central bioenergy nodes. Public-private investment partnerships can fund infrastructure expansions, for example retrofitting berths for biofuel handling with government grants or low-cost loans matched by private investment in storage. Integrated modal planning should link ports to road and rail upgrades,

[6] https://www.ara.net.au/wp-content/uploads/ARA-Freight-Modal-Shift-Report.pdf

such as improving rail access to ports to handle increased feedstock inflows and outbound fuel distribution. For instance, a new SAF plant could be paired with a rail shuttle to the nearest capital city airport, reducing reliance on road tankers. Ensuring regulatory clarity and consistency across environmental approvals, fuel quality certification, and maritime safety will further incentivise investment. With such planning, Australia's ports and coastal vessels can efficiently distribute LCLFs domestically and internationally, supporting a low-carbon trading position and a sustainable biofuels industry.

6D. AVIATION

Aviation is widely recognised as one of the most challenging sectors to decarbonise. For long-haul flights, there are currently no viable alternatives to liquid hydrocarbon fuels – battery technology lacks the required energy density, while hydrogen or ammonia-based concepts remain experimental and likely limited to short ranges before 2050. Thus, decarbonisation over the next 20–30 years depends almost entirely on the adoption of sustainable aviation fuels. Australia's aviation industry, from Qantas and Virgin to international carriers using our airports, will need substantial SAF volumes to meet emissions targets and regulatory requirements. This creates both significant demand and logistical considerations.

Airport infrastructure has been optimised for traditional jet fuel (Jet A-1) over decades. Integrating SAF will face several barriers. Fuel storage and hydrant systems have finite capacity and tight specifications. Many airports operate underground pipelines that deliver jet fuel directly to gates, typically designed for a single fuel type. Introducing SAF, especially if delivered unblended, may require additional on-site tanks before blending. Pre-blended SAF must meet Jet A-1 specifications to enter the hydrant system. Limited tankage and the need for fuel segregation constrain operations, and major airports like Sydney and Melbourne may need expanded fuel farms or additional piping to handle SAF and conventional fuel in parallel. The Sydney SAF trial demonstrates that existing infrastructure can manage SAF if properly handled, but scaling up to, for example, 10% SAF would require upgrades.

Operational complexity and timing present further challenges. Airports are high-throughput nodes, and delays in SAF supply or batch testing could disrupt flights. Each SAF lot must meet ASTM jet fuel standards and be approved by airlines and engine manufacturers. Streamlined testing and pre-certification before arrival are crucial to ensure seamless integration. Curfews at airports such as Sydney and Adelaide also constrain fuel delivery, requiring careful scheduling.

On the opportunity side, aviation's commitment to reducing emissions is growing, anchoring the low-carbon fuels industry. Airlines and airports are forming partnerships, such as Qantas' SAF Coalition[7], to signal demand and pool purchasing, providing certainty for producers. Australian airports aim to become Asia–Pacific SAF hubs – Sydney Airport targets 50% SAF by 2050[8] and highlights New South Wales's advantage in producing feedstocks like canola, currently exported for biofuel refining. Domestic processing could supply local flights and regional markets, creating jobs, improving fuel security, and reinforcing a virtuous cycle between demand and production.

Coordinated logistics working groups involving airlines, airports, fuel suppliers, and government are a practical step forward. These groups can plan SAF delivery – whether via pipelines or off-peak tanker trucks – and address regulatory or safety hurdles. Integration with regional hubs and export markets presents additional opportunities: surplus SAF could be exported to Asia or Pacific hubs, leveraging Australia's strategic geography to serve long-haul flights efficiently.

Policy support is essential. SAF is significantly more expensive than conventional jet fuel, and without mandates or incentives, adoption at scale is unlikely. A blending mandate, even a modest one, would drive local production. Public procurement could support the market by requiring SAF use for Commonwealth-funded travel or subsidising critical flight routes, particularly to remote areas. Combined with aviation's long-term demand, such measures would strengthen domestic SAF supply and ensure Australian aviation remains internationally competitive as sustainability becomes a key factor.

6E. PIPELINES AND TERMINALS

A key barrier is product segregation. Existing pipelines and terminals are designed for fossil fuels with specific properties. While renewable diesel and SAF are drop-in fuels and can theoretically share infrastructure, strict quality regulations may still require dedicated batches or cleaning between transfers, especially early on when volumes are small. Terminals may need additional tanks, separate pumping and metering systems, and quality-control labs to ensure correct blends and avoid contamination. Engineering considerations also extend to equipment compatibility, including seals, gaskets, and pumps, particularly for fuels such as ethanol.

Throughput limitations present another constraint. Pipelines have fixed diameters and flow capacities, and terminals are limited by the number of loading bays. Increased LCLF volumes could create bottlenecks unless pipelines are upgraded

[7] https://www.qantas.com/au/en/qantas-group/sustainability/our-planet/sustainable-aviation-fuel/saf-coalition-program.html

[8] https://www.sydneyairport.com.au/corporate/sustainability/ensuring-a-sustainable-future/decarbonisation

or paralleled, and terminals expanded to accommodate in-line blending and additional handling time. Planning and regulatory approvals for new pipelines or major terminal upgrades can be complex, requiring environmental assessments, land access negotiations, and community consultations, which must be managed efficiently to prevent supply chain delays.

Despite these barriers, pipelines provide unparalleled efficiency and safety. They remove thousands of truck movements from roads, reducing traffic, accidents, and emissions. Existing Australian pipelines, such as those linking Brisbane and Geelong refineries to city airports and depots, could potentially be repurposed, or extended for biofuels. Co-locating new biorefineries with pipeline endpoints allows fuel to flow through existing infrastructure, minimising new capital investment while improving operational flexibility and resilience.

Terminals themselves can become blending and distribution hubs for LCLFs. In-line blending systems enable precise control of renewable diesel or ethanol mixes to meet mandate requirements, while on-site quality-control labs ensure compliance before distribution. A network of terminals storing both fossil and biofuels across the country strengthens national resilience, buffering against shocks such as natural disasters or import disruptions. This also directly addresses fuel security: Australia currently holds roughly one month of diesel and jet fuel reserves, far below international best practice[9], and domestic biofuels stored in terminals could augment these reserves and supply critical services, including Defence and emergency operations.

Government support should focus on strategic land protection and clear regulatory frameworks. For pipelines, this could include reserving future corridors, streamlining approvals, and incentivising initial projects linking biofuel production to major demand centres. For terminals, it involves ensuring zoning and environmental licences accommodate biofuel storage and handling and encouraging investment in blending infrastructure and additional tank capacity. With foresight and coordinated investment, pipelines and terminals can become the arteries and organs of Australia's bioenergy system, efficiently transporting, and storing fuel to support a decarbonised transport sector.

7. Integrating Bioenergy with National Freight Planning

Biofuels will only be as successful as the ability to move their inputs and outputs efficiently. Therefore, the deployment of bioenergy must be deliberately integrated with Australia's broader freight and infrastructure planning efforts. The National Freight and Supply Chain Strategy already provides a framework for improving and investing in freight corridors; aligning bioenergy initiatives with this strategy will ensure that infrastructure capacity is expanded in tandem with fuel production capacity.

In practical terms, this integration means recognising that freight is not ancillary to the biofuel industry but enabling infrastructure for it. If a region is identified in the NBFS as a potential bioenergy hub due to high feedstock availability, this should be cross-checked with freight plans: do we have sufficient road or rail links to that region? If not, can they be upgraded or is there a plan to do so? If a new freight corridor (like the Inland Rail) is being developed, can we encourage bioenergy facilities along its route, knowing that transport will be easier there? Such cross-sector planning can significantly lower the delivered cost of biofuels and improve their competitiveness.

Each freight mode has a role: bulk feedstocks over long distances are best moved by rail or coastal shipping, road freight handles collection and distribution, and pipelines suit high-volume flows to major demand centres. Intermodal hubs should coincide with bioenergy clusters—for example, biomass pelletisation or SAF offloading—creating a "bioenergy logistics highway" within the national network.

Coordination is key. Different government agencies and industry bodies must work together: transport planners should be at the table when bioenergy policies are discussed, and vice versa. One idea is to include bioenergy considerations explicitly in freight corridor investment decisions – for example, if evaluating a proposal to upgrade a highway, factor in how it might facilitate movement of new-energy commodities like biofuels or hydrogen. Conversely, when providing a grant for a new biorefinery, consider tying it to commitments or plans to utilise rail or port infrastructure effectively (perhaps even making funding conditional on a certain logistics plan that minimises emissions). This ensures neither side (fuel production or freight) develops in isolation.

Integrating with national freight planning also means timing the rollout in phases that make sense. Early on, it may be prudent to prioritise high-feasibility corridors and gateways for biofuel deployment – those are routes where infrastructure is already strong or easily enhanced, and where demand for low-carbon fuel is concentrated. The east coast trucking corridor between Melbourne, Sydney, and Brisbane carries a massive freight task and traverses regions of significant

[9] https://austlogistics.com.au/wp-content/uploads/2025/01/Submission-250131-2025-26-Pre-Budget-2.pdf#:~:text=Strategic%20fuel%20stockpiling%20is%20another,recent%20efforts%2C%20including%20increased%20baseline

biomass production and consumption. Targeting that corridor for an initial biofuel supply chain pilot (with set production facilities, dedicated trucks or rail services, and supportive policies) could demonstrate success and build momentum. Similarly, major gateways like Port of Brisbane or Port of Newcastle – which handle both agricultural exports and fuel imports – might be ideal starting points to establish biofuel production or blending facilities because they already have some necessary infrastructure and skill base.

In later phases, as the industry scales and technologies mature, integration with freight planning will help extend the benefits nationwide, including to more remote or challenging areas (WA or far north QLD). By continuously aligning the expansion of bioenergy with the evolution of freight networks, we ensure that logistics capacity never becomes the bottleneck to bioenergy growth. In fact, done right, Australia's freight network upgrades and bioenergy growth can synergize : freight improvements reduce transport costs for biofuels, making them more viable, while the demand for biofuel transport can justify certain freight investments that benefit the whole economy (better rural roads that also help farmers, or port improvements that aid all exporters).

8. Resilience, Defence Capability, and Export Positioning

Beyond the immediate economic and environmental benefits, developing a domestic LCLF industry offers strategic advantages for Australia's resilience and security. Fuel is a critical resource for national defence, emergency services, and essential industries. Securing a local supply of renewable diesel and SAF would strengthen energy sovereignty and reduce reliance on imported fossil fuels, which remain vulnerable to global shocks. This is particularly salient given Australia's current fuel security: with only two aging oil refineries (focused mainly on petrol) and heavy dependence on imported diesel and jet fuel[10], the logistics sector and defence are exposed to supply disruptions. A robust domestic biofuel capability would function as a buffer, and co-locating production and storage near defence bases or emergency hubs could ensure first responders and defence forces have assured access during crises.

Integrating bioenergy into strategic infrastructure also builds redundancy. Using multiple feedstocks and technologies—ethanol from sugar in one region, renewable diesel from waste oils in another, SAF from municipal waste elsewhere—ensures that a shortfall in one feedstock does not disrupt the entire fuel supply. This distributed production model, connected through logistics, creates a more resilient national network. It also provides flexibility for specialised needs: for instance, military operations often require fuels that are drop-in for jet engines and heavy vehicles, such as SAF or hydrotreated vegetable oil (HVO) diesel. In emergencies, domestic LCLFs enable humanitarian relief flights, evacuations, and power generation without reliance on imports.

From an economic and strategic perspective, Australia has an opportunity to leverage its agricultural base, abundant sunlight, and biomass resources to become a competitive exporter of SAF and renewable diesel. The global market for these fuels is expected to tighten through the 2030s[11], and early movers can capture value by processing local feedstocks into high-value fuels rather than exporting raw inputs. This mirrors traditional energy export strategies, but now with sustainable products. Value-adding domestically creates regional jobs and aligns with agricultural export strategies, turning feedstocks like canola and tallow into finished fuels for domestic and international markets.

To realise this opportunity, coordinated action is needed across industrial land, port capacity, and pipeline access for export-oriented projects. SAF plants targeting Asia-Pacific markets require dedicated port facilities, and long-term supply agreements supported by government diplomacy or trade deals would secure buyers. Certification must meet international sustainability standards to ensure market acceptance. Domestically, mandates and government procurement can create baseline demand, justifying investment in plants that can later scale to supply exports. Early development positions Australia as a regional hub, attracting investment, technology, and influence over regional SAF standards or credit schemes.

Finally, developing LCLFs supports Australia's international commitments and reputation. Demonstrating progress in hard-to-abate sectors such as transport strengthens credibility, shows contribution to global decarbonisation, and opens opportunities for collaboration on bio-refineries or feedstock logistics with other countries. A thriving domestic LCLF industry is a strategic asset: it underpins national resilience and defence self-sufficiency, while projecting Australian leadership in the emerging clean energy economy.

[10] https://austlogistics.com.au/wp-content/uploads/2025/01/Submission-250131-2025-26-Pre-Budget-2.pdf#:~:text=Strategic%20fuel%20stockpiling%20is%20another,recent%20efforts%2C%20including%20increased%20baseline

[11] https://www.spglobal.com/commodity-insights/en/news-research/latest-news/agriculture/060525-global-saf-supply-to-fall-23-million-mt-short-of-demand-by-2035skynrg#:~:text=By%202030%2C%20global%20SAF%20demand,mandates%20and%20voluntary%20airline%20targets

9. Governance and Implementation

Achieving the vision of a scaled-up, logistics-integrated biofuel industry will require thoughtful governance and phased implementation. This transition is complex, involving many stakeholders and moving parts – from farmers and fuel companies to transport operators and various levels of government. A coherent governance framework can ensure that efforts are aligned, progress is monitored, and policies are adjusted as needed over time.

One key recommendation is to pursue a phased deployment strategy for LCLFs, focusing first on high-impact, high-feasibility opportunities. In the initial phase (the next 5 years), government and industry should target a few critical supply chains and corridors to roll out pilot projects. These might include, for example, a resolute SAF supply chain for one major airport, or a renewable diesel program for trucking along a major highway corridor coupled with a regional feedstock hub. By concentrating resources and attention on these early projects, we can demonstrate viability, learn practical lessons, and build public confidence. Early successes will create momentum – proving that, say, a certain region can supply X million litres of biofuel reliably will encourage expansion in other regions. This phase should build on collaborative mechanisms such as the National Feedstock-Logistics Taskforce outlined earlier.

As the industry moves into a growth phase (5–15 years out), governance should shift towards scaling and integration. This involves embedding biofuels into mainstream fuel markets and freight systems. Regulatory measures like increasing blending mandates would kick in according to a predefined schedule (providing a roadmap for scale-up), and infrastructure planning should start incorporating biofuel needs routinely – for instance, any new freight terminal built from now on should consider if it needs biofuel storage or electric charging, anticipating a multi-fuel future. Government coordination across departments will be critical: agriculture departments (ensuring feedstock supply and sustainability), energy/environment departments (overseeing emissions reductions and fuel quality standards), transport/infrastructure departments (ensuring the physical supply chain is capable), and industry/trade departments (facilitating investment and export opportunities) all have roles. A high-level interdepartmental board or steering committee on bioenergy could be established to keep these efforts aligned and report directly to central economic ministers, given the cross-cutting nature of the challenge.

Transparency and data will greatly aid implementation. We recommend establishing mechanisms for collecting and sharing data on feedstock flows, fuel production, and supply chain performance. This could include, for example, a national bioenergy supply chain database or dashboard tracking volumes of feedstock harvested, volumes of biofuel produced, inventory levels at key terminals, and GHG emissions savings achieved. Such data, potentially collected in partnership with industry but anonymised and aggregated, would allow for informed decision-making and public reporting. It would highlight bottlenecks (e.g. if feedstock from a certain region is not making it to market due to transport shortfalls) so they can be addressed proactively. It would also allow verification of progress towards targets – for instance, if a 10% renewable diesel mandate is in place for 2030, data can show if we are on track or if mid-course corrections (like additional incentives) are needed. Building trust through transparency is important, especially since many stakeholders (farmers, communities, transporters) need assurance that this emerging industry is delivering intended benefits like local jobs or emission cuts.

To guide the private sector and avoid fragmented efforts, government can provide clear policy roadmaps and milestones. This includes publishing timelines for when certain decisions will be made (such as the review points for increasing blend percentages), criteria for accessing funds or grants (so proponents can plan projects to meet them), and regular reviews of the strategy (perhaps every 2-3 years) to incorporate new technologies or global developments. Embedding review and feedback loops is wise because the bioenergy landscape is evolving – for instance, if a breakthrough in algae-based biofuel occurs or if global feedstock prices shift, Australia's strategy might need recalibration. The governance framework should be flexible enough to adapt, while still maintaining long-term direction and commitment that investors can rely on.

Finally, implementation will benefit from maintaining strong stakeholder engagement throughout. ALC and its members, along with representatives of the agricultural sector, fuel industry, Indigenous landowners, environmental groups, and others, should have fora to provide input as the strategy rolls out. Continuing the collaborative spirit of the NBFS consultation, perhaps through an ongoing advisory council, will ensure that operational realities (like those ALC members are familiar with in freight) remain front-of-mind as policies turn into practice. By keeping the channels of communication open and responsive, Australia can avoid unintended consequences and solve problems faster. In essence, good governance for this initiative means being strategic in planning, transparent in progress, adaptive in execution, and inclusive in collaboration. With those principles, the ambitious vision of a thriving low-carbon fuels industry, supported by world-class logistics, can become a reality on the ground.

10. Recommendations

In light of the analysis above, ALC proposes the following key recommendations to the Department of Agriculture, Fisheries and Forestry to ensure that Australia's bioenergy ambitions are realised efficiently, safely, and at scale:

1. **Integrate Logistics into Bioenergy Planning:** Include freight and supply chain considerations in the National Bioenergy Feedstock Strategy, co-locating production with transport links.
2. **Protect and Develop Strategic Infrastructure and Land:** Safeguard industrial land near ports, airports, rail heads, and highways; support early investment in tank farms, pipelines, rail sidings, and port upgrades.
3. **Harmonise Regulations Across Jurisdictions:** Streamline vehicle mass/dimension limits, permits, and coastal shipping rules to improve cross-border supply chain efficiency.
4. **Establish a National Feedstock-Logistics Taskforce:** Coordinate agencies and industry to map supply chains, share data, and prioritise infrastructure for bioenergy.
5. **Provide Demand Certainty through Policy Measures:** Implement blending mandates, government procurement, and credit/subsidy schemes to underpin nascent markets.
6. **Expand Certification and Tracing Systems:** Accelerate Guarantee of Origin coverage and robust tracking to meet international standards, unlock exports, and build investor confidence.
7. **Align with National Strategies and Set Milestones:** Ensure rollout complements freight, hydrogen, and land-use strategies, with clear, measurable milestones.
8. **Support Modal Shifts and Freight Decarbonisation:** Incentivise rail or coastal shipping for feedstocks; promote LCLF adoption in trucking and rail to compound emissions savings.
9. **Strengthen Fuel Security and Emergency Planning:** Incorporate biofuels into strategic reserves and contingency plans to support critical services during crises.
10. **Foster Industry Collaboration and Skills Development**: Support cross-industry platforms, regional training, and workforce development for biofuel logistics, handling, and quality assurance.

By implementing these recommendations, the Department can help ensure that Australia's emerging biofuels industry is underpinned by a strong and smart logistics system. This will minimize growing pains and costs, accelerate emissions reductions in transport, and position Australia as a leader in sustainable fuel – delivering environmental, economic, and strategic benefits for decades to come.