March 2026

Biofuels Paper

From Feedstocks to Fuels: Australia's Evolving Biofuels Sector

- Biofuels are once again rising on the national agenda as Australia seeks greater fuel security and low-carbon options for areas such as heavy transport, mining and aviation.
- Australia has abundant biofuel feedstocks such as canola, tallow, used cooking oil, sugarcane and residues, but limited domestic capacity to turn them into renewable diesel and sustainable aviation fuel (SAF).
- A combination of biofuel incentives and mandates with penalties, legislated across the OECD including the United States, Europe and Asia, are driving demand and strong price signals for production of biofuels.
- These signals are lifting demand and competition for biofuel feedstocks, creating both opportunities and cost pressures for Australian producers.
- Domestic policy settings, investment decisions and industry partnerships over the next five years will determine whether Australia becomes a producer of advanced biofuels or continues exporting raw materials for others to refine.

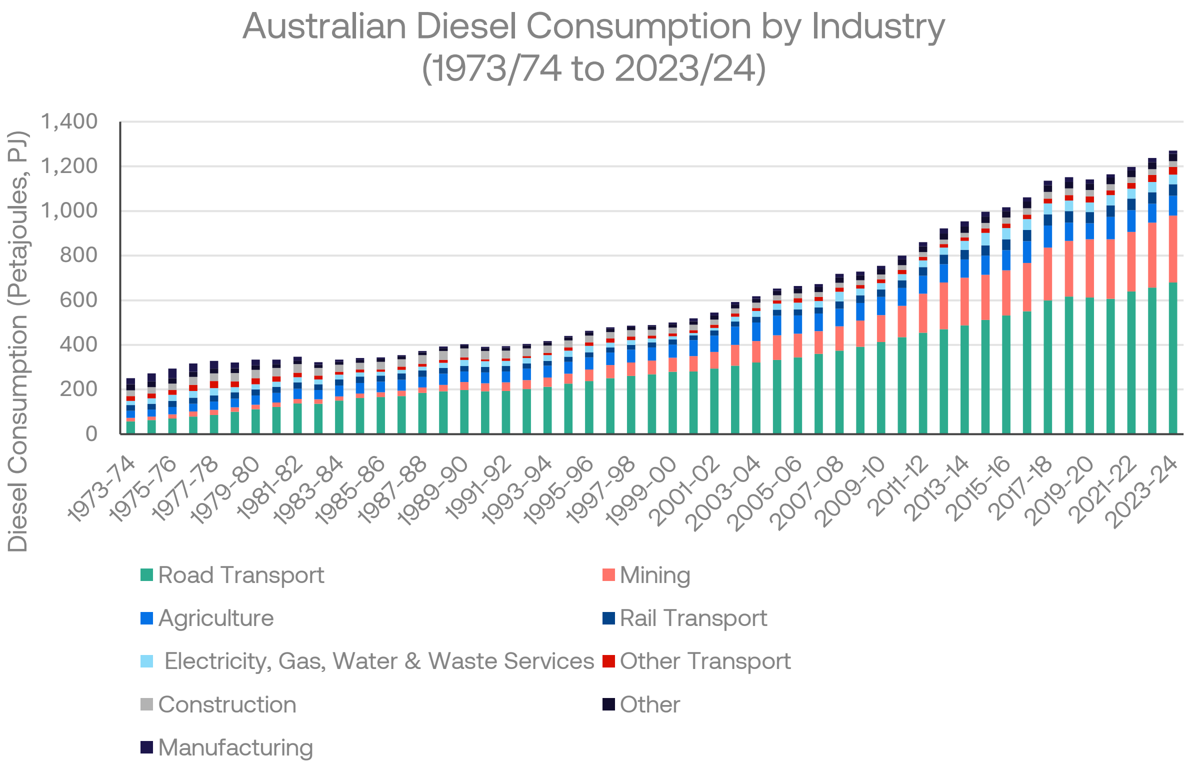
Introduction

Biofuels rarely make daily headlines, yet they sit behind some of Australia's most important energy questions. They influence how aircraft will refuel at major airports, how mining fleets operate in remote regions, how freight moves across Australia's highways and how farmers power machinery at harvest. For many consumers, biofuels mean E10 at the bowser or a council truck labelled "powered by biodiesel". In reality, biofuels reach far further across fuel security, agricultural markets, regional development and Australia's broader decarbonisation goals.

Although biofuels have not always been prominent in public debate, they have remained a priority for parts of industry, especially aviation, mining and long-haul freight. In 2025 their role in Australia's energy mix became more visible with the introduction of the A$1.1 billion Cleaner Fuels Program[1] to support domestic production of renewable diesel, sustainable aviation fuel (SAF) and other low-carbon liquid fuels (LCLFs). This has helped bring biofuels more firmly into the national conversation about future fuels and how far Australia should move beyond exporting raw feedstocks.

[1] Joint media release: Fuelling the future: $1.1 billion to power cleaner Aussie fuel production | Ministers

Australia already has operating ethanol and biodiesel plants, along with pilot and demonstration projects for next-generation fuels. Industry and investor momentum is now increasing, driven by rising global demand and clearer international policy signals. Yet Australia's ability to participate fully depends on more than just the availability of today's dominant feedstocks. It also reflects the scale and diversity of the country's agricultural and forestry productive capacity, as well as its diverse bio-waste streams. Together these will shape how Australia can participate in both current biofuel markets and the evolution of more advanced fuel pathways as technologies and regulations develop. The country lacks large-scale refining and associated infrastructure, meaning a significant share of processing margin and downstream value-add is captured overseas. The next decade will determine whether Australia develops this capability domestically or remains primarily an exporter of raw materials.



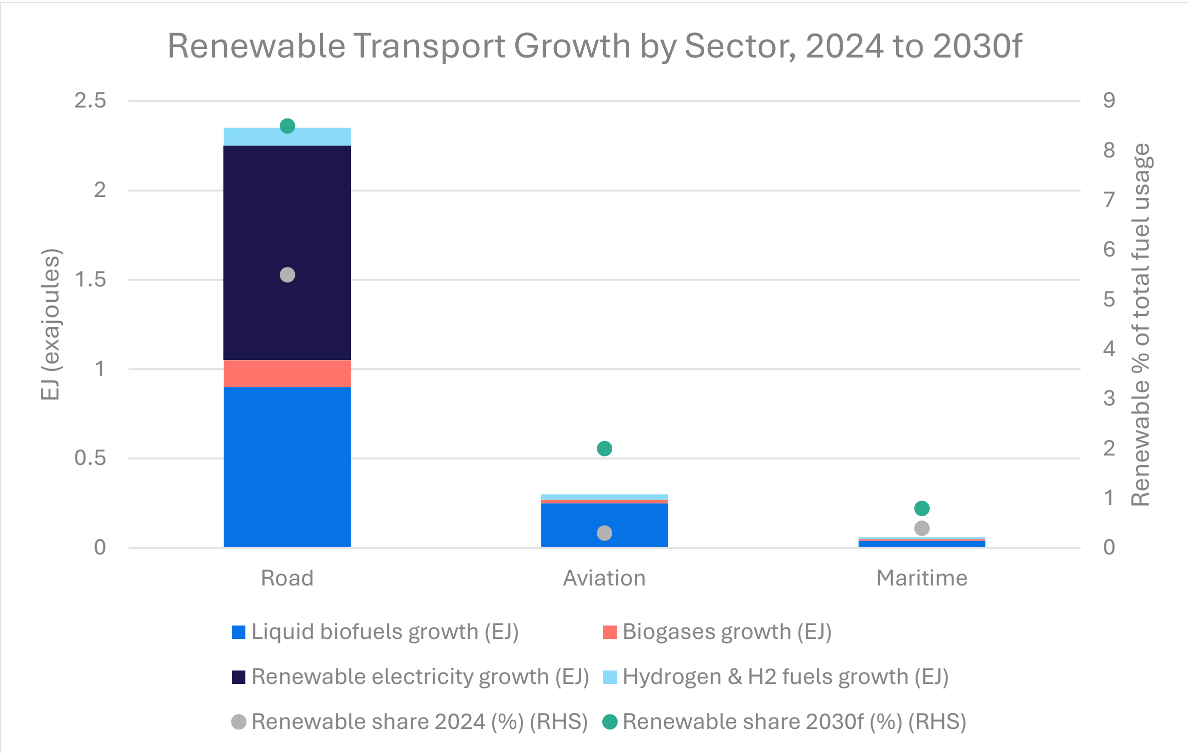
Note: 1 PJ ≈ 25–30 million litres of diesel-equivalent (by energy content)
Source: Australian Energy Update 2025 (DCCEEW), ANZ

Australia's diesel consumption has more than quadrupled since the 1970s, with road transport and mining now dominating demand and driving overall growth. This scale of use explains why biofuels policy focuses on whether domestic low-carbon fuels can realistically displace diesel in freight, resources and agriculture rather than delivering marginal gains in smaller sectors.

What Are Biofuels?

Biofuels are liquid fuels made from recently grown or collected plant and animal material, such as crops, waste cooking oil or animal fats, rather than from crude oil pumped from underground. When biofuels are burned, the carbon they release comes from this recent biological material, not from fossil fuels that have been stored underground for millions of years. Over the whole process of growing, collecting, processing, transporting and finally burning the fuel – often called its "lifecycle" – this can result in lower greenhouse gas emissions than conventional petrol, diesel or jet fuel.

In practice, however, biofuels are not all the same. Different fuels are made in different ways, deliver different emissions reductions and face different rules about where and how they can be used, which affects their cost, market access and long-term role in the energy system. Depending on the feedstock used and the processing technology involved, biofuels can also have very different environmental, nature and community impacts. As biofuel technologies advance and policy settings evolve, the relative competitiveness of different fuels increasingly depends on the emissions reductions they deliver and the industries, engines and infrastructure they can realistically serve.



Note: 1 EJ ≈ 25–30 billion litres of diesel-equivalent (by energy content)
Source: International Energy Agency (IEA) 2025, ANZ

Most growth in renewable transport energy to 2030 is expected to occur in road transport, reflecting continued expansion of biofuels and electrification. Aviation accounts for a smaller share of total growth but sees a faster rise in renewable fuel penetration, driven by the emergence of SAF.

Four fuels dominate Australian discussions:

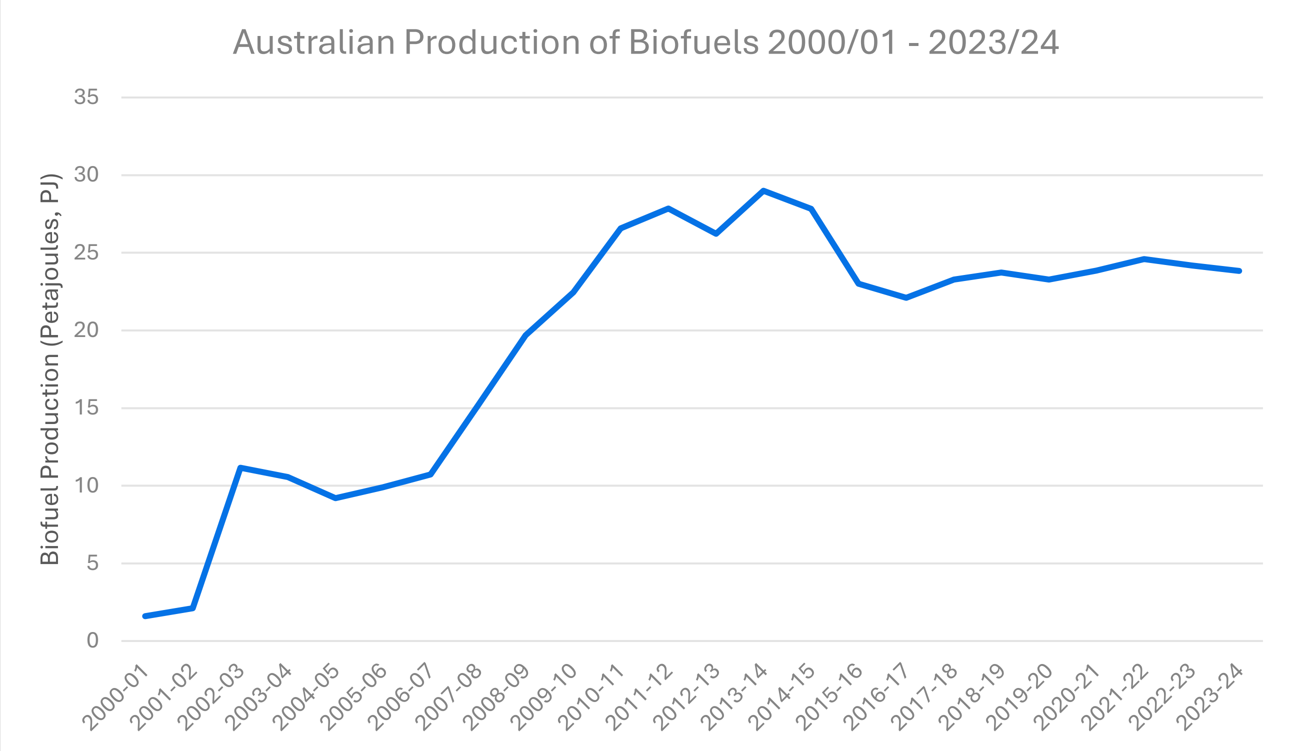
Ethanol is made by fermenting sugars and starches, mainly from sugarcane, grain and sorghum. It is blended into petrol at up to 10 percent (E10) and has been part of the Australian fuel mix for decades. Australia typically produces around 175 to 250 million litres of fuel ethanol a year from an installed capacity of roughly 400 to 440 million litres, although output varies with feedstock availability and market conditions.[2] On a lifecycle basis, Australian fuel ethanol typically delivers emissions reductions of around 20 to 50 percent relative to petrol, depending on feedstock, processing energy and land-use assumptions.

Biodiesel is produced by chemically converting fats and oils into fatty acid methyl ester (FAME). In Australia it is mainly made from used cooking oil, tallow and some vegetable oils. Because biodiesel is not identical to fossil diesel, most engine manufacturers set limits on how much can be blended into standard fuel, typically B5 or B20 – meaning fuel that contains 5 percent or 20 percent biodiesel and the balance fossil diesel. These blend limits mean biodiesel is most commonly used in fleets with controlled refuelling and maintenance, such as council trucks and buses, where fuel quality can be closely managed. Lifecycle emissions reductions for biodiesel vary widely but are commonly in the range of 40 to 80 percent compared with fossil diesel when produced from waste oils and animal fats, with lower reductions for crop-based feedstocks.

Renewable diesel, also known as hydrotreated vegetable oil (HVO), is produced by putting fats and oils through a refining process called hydrotreating, where the feedstock is treated with hydrogen under high pressure and temperature. This removes oxygen and impurities and restructures the molecules, resulting in a "drop-in" biofuel that is chemically almost identical to fossil diesel. Because of this, renewable diesel can be used in any modern diesel engine at any blend using the same storage tanks, pumps and infrastructure. It performs well in cold conditions and produces lower particulate emissions and is now the fastest-growing biofuel globally. Australia currently imports only small volumes for trials and there is no commercial-scale domestic production yet. Like biodiesel, renewable diesel made from waste-based feedstocks like tallow or used cooking oil, can deliver lifecycle emissions reductions of roughly 50 to 80 percent relative to fossil diesel, while retaining full compatibility with existing engines and infrastructure.

Sustainable Aviation Fuel (SAF) is a "drop-in" replacement for traditional jet fuel that can be made from a range of feedstocks including waste oils, ethanol, municipal waste and forestry or crop residues. It can be blended directly with existing jet fuel and used in today's aircraft and airport infrastructure without modification. Across its full lifecycle, SAF can reduce emissions by roughly 50 to 80 percent compared with fossil jet fuel, depending on feedstock and how the fuel is produced. Global supply remains well under 1 percent of total jet-fuel use, yet SAF is central to aviation decarbonisation, and airlines and airports are increasingly setting their own SAF adoption targets for 2030 and beyond.

[2] https://www.graincentral.com/news/australias-ethanol-plants-underutilised-by-60pc/



Note: 1 PJ ≈ 25–30 million litres of diesel-equivalent (by energy content)
Source: Australian Energy Update 2025 (DCCEEW), ANZ

Australian biofuel production rose sharply in the early 2000s as ethanol and biodiesel capacity expanded under state-based blending mandates and high oil prices, before plateauing and easing after the mid-2010s as policy support weakened and feedstocks flowed more readily into export markets. Since then, production has remained relatively stable, highlighting both the longevity of Australia's biofuels sector and its limited scale without broader national incentives or new refining investment.

How Biofuels Differ from Low-Carbon Liquid Fuels

As policy and finance frameworks evolve, it is also important to distinguish between biofuels and the broader category of low-carbon liquid fuels.

- **Biofuels** are defined by their origin – they are made from biological feedstocks such as crops, crop and forestry residues, used cooking oil, animal fats and other forms of non-agricultural bio-waste streams including MSW.
- **Low-carbon liquid fuels (LCLFs)** are defined by their emissions output – they can be bio-based, synthetic or a mix, but must show verified reductions in greenhouse gas emissions over their full lifecycle compared with conventional petrol, diesel or jet fuel.

This distinction matters because emerging standards and taxonomies, including the Australian Sustainable Finance Taxonomy[3], assess fuels on the emissions output rather than the feedstock. That in turn can influence which projects qualify for green or transition finance, how investors classify assets and how companies report progress against decarbonisation targets.

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[3] https://www.asfi.org.au/about-taxonomy

Why Biofuels Are Increasingly in Focus

Fuel security

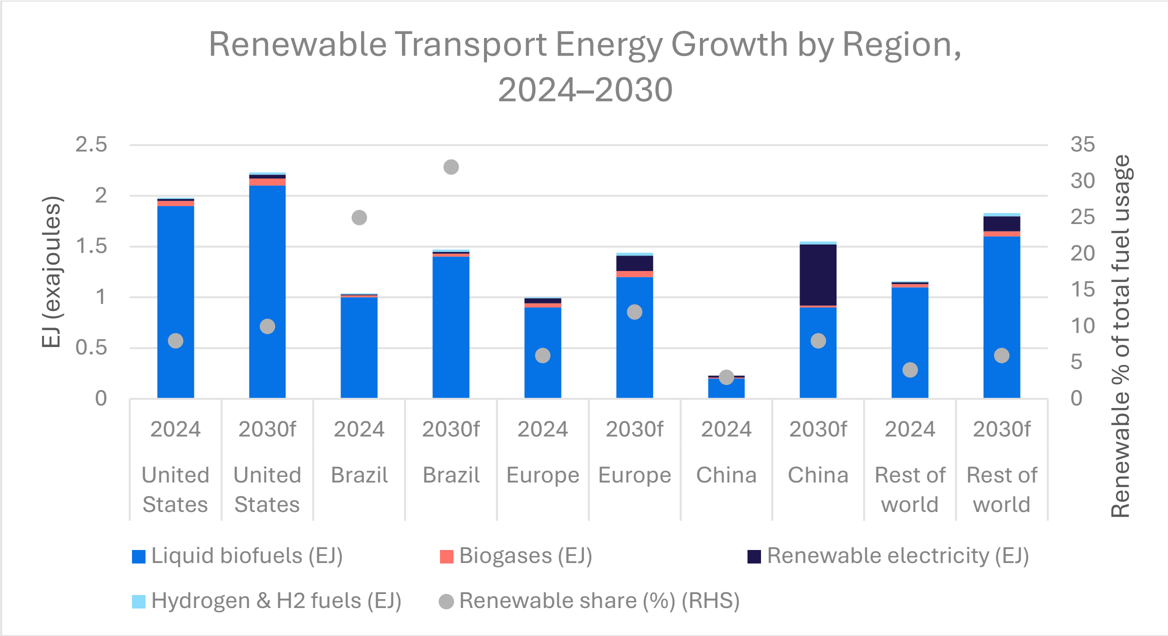
Fuel security is a major driver of renewed interest in biofuels. Australia imports most of its refined fuels, which means the country is exposed to refinery shutdowns, shipping delays and geopolitical disruptions. Any significant interruption could affect the movement of trucks, trains, aircraft and agricultural machinery – and, in turn, the supply of food, construction materials, medical goods and other essential services. While biofuels cannot replace fossil fuels overnight, even modest domestic production of renewable diesel or SAF would diversify supply for sectors that cannot easily electrify, including heavy transport, mining, aviation and long-haul freight.

Agricultural opportunity

Rising demand for biofuel feedstocks such as sugarcane, grains, canola and other oilseeds, as well as tallow from livestock processing, could open new revenue streams for Australia's farming sector. For waste streams such as tallow, used cooking oil, forestry residues and MSW, biofuels could also create a pathway to monetise materials that would otherwise be low-value, difficult to dispose of or exported with limited local value-adding. Instead of selling these products only into food and feed markets or disposing to landfill, producers may also increasingly be able to supply feedstocks for biofuel production in Australia and overseas, which could give farmers and feedstock owners across processing, forestry and waste sectors more options for managing price volatility, planning crop rotations over time, diversifying income streams and mitigating waste risks. Locating biofuel production facilities in regional areas close to feedstocks could also support local processing, jobs and infrastructure development.

Global policy momentum

International policy shifts are reshaping biofuel markets worldwide. The United States, Europe and several Asian countries have introduced strong incentives and blending mandates that are driving rapid growth in renewable diesel, SAF and other low-carbon fuels. Because Australia exports large volumes of canola, tallow and other potential feedstocks, these global developments flow directly into Australian markets. Higher international demand can lift export returns, but it can also raise domestic feedstock prices and increase competition for materials that Australian projects would need for local refining. As a result, Australia's biofuels landscape is now closely tied to policy settings well beyond its borders.



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Source: International Energy Agency (IEA) 2025, ANZ

Liquid biofuels account for most forecast renewable transport energy growth to 2030 across all regions, particularly in the United States and emerging markets. Brazil starts from a much higher renewable share, while Europe and China see a sharper rise in electricity and hydrogen as part of broader transport electrification strategies.

Decarbonisation targets

Australia's national emissions reduction targets now include a commitment, announced by the Australian government in September 2025[4], to reduce net greenhouse gas emissions by 62–70 percent below 2005 levels by 2035. In electricity and light vehicles, most reductions are expected to come from more renewable power and the uptake of battery-electric cars. For activities that are currently much harder to run on electricity - such as parts of aviation, heavy transport, mining and agriculture - current policy settings and investor expectations assume a role for LCLFs alongside efficiency improvements, green hydrogen and other emerging technologies. This is one reason governments, investors and companies are paying closer attention to LCLFs, inclusive of some biofuels. This focus on lifecycle emissions is being reinforced by emerging requirements for companies to measure and disclose emissions across their supply chains, increasing attention on the full emissions profile of fuels rather than just their point of use.

Electrification gaps

These electrification gaps fall into three broad categories: applications where current battery technology itself cannot meet power and duty-cycle requirements, applications where electrification would require fundamental changes to underlying infrastructure that are unlikely to be commercially viable, and applications where electrification is technically feasible but constrained in practice by the availability and cost of fast-charging infrastructure.

[4] Setting Australia's 2035 climate change target | Prime Minister of Australia

Heavy trucks, large farm machinery, aircraft, locomotives and mining equipment need high-energy fuels and long operating hours. Electrification is present in smaller or lighter agricultural machines and in short-range fleet work around cities, where vehicles follow low range routes and can recharge at depots. Even in urban freight, large trucks operated by logistics providers and supermarket supply chains can currently only electrify where charging infrastructure, vehicle dwell time and route design are carefully coordinated. It is also being used for equipment that operates in fixed areas such as sheds, glasshouses and packing facilities. However, large tractors, harvesters and mining trucks must deliver very high torque – the rotational force needed to pull heavy loads – for long periods, which remains challenging for current battery systems. As a result, liquid fuels are likely to remain central to these operations for some time, even as electrification expands in lighter equipment and urban fleets.

Biofuels in Australia

Australia's biofuels industry reflects an early generation of development that began in the 2000s and expanded modestly through the mid-2010s. Ethanol and biodiesel remain the established fuels, while renewable diesel and SAF are still at early stages of commercialisation. Most facilities built in the first wave of investment continue to operate but often below capacity, influenced by feedstock prices, export demand and the absence of national blending mandates.

Current ethanol production capacity is around 400 million litres, although recent output has generally been lower – typically in the range of 175 to 250 million litres a year, depending on feedstock availability and market conditions. Queensland's biofuels sales mandate, which sets minimum ethanol sales volumes for large fuel suppliers, underpins the strongest and most stable domestic demand for E10. New South Wales also has blending requirements under its Biofuels Act, though enforcement and consumer uptake vary, and other states have no mandates. Feedstock economics play a major role: in some years sugarcane, molasses and grain command higher returns in food or export markets, limiting the volumes available for fuel.

Biodiesel production is comparatively small and highly variable, with installed capacity of around 100 million litres a year but current utilisation well below that level, supplied by a handful of small and mid-sized plants located near rendering facilities and major population centres.[5] Because biodiesel is constrained by blend limits such as B5 and B20, most use occurs in controlled fleets – councils, bus operators and some industrial operations – where fuel quality and maintenance can be closely managed.

[5] Australian Biodiesel Producers, "Position Statement – Australia Low Carbon Liquid Fuel Opportunity", June 2024.

Renewable diesel has attracted growing interest but remains at the trial stage in Australia. Mining companies, freight operators and several councils have tested imported renewable diesel – most commonly HVO - in heavy vehicles, with results showing performance broadly equivalent to fossil diesel. However, Australia has no commercial-scale renewable diesel production, and current proposals in Queensland, Victoria and Western Australia remain in feasibility or early engineering. Progress hinges on feedstock availability, investment conditions and long-term offtake agreements, alongside policy and regulatory settings that shape project economics.

Sustainable Aviation Fuel is also at an early stage. Australia's annual jet-fuel demand is measured in several billion litres, yet SAF accounts for only a fraction of 1 percent of supply, all of it imported for trials or specific flights. Proposed domestic SAF projects span all major pathways and are advancing through early development stages. Major airports are preparing for SAF distribution by examining storage, blending and quality-control upgrades. Airlines including Qantas, Virgin Australia, Singapore Airlines, Emirates, United and others servicing Australia have announced SAF use targets for 2030 and beyond, helping create clearer future demand signals.

Australia is also seeing increasing activity from start-ups and early-stage technology developers focused on next-generation fuel pathways, feedstock technologies, waste-to-fuel systems and lifecycle-emissions verification. These firms are being supported by climate-tech investors and scale-up programmes. Globally, refiners, airlines and energy companies are increasingly partnering with or acquiring start-ups rather than developing proprietary technology in-house, a trend that is beginning to appear in the Australian market as well.

Overall, Australia's current biofuel landscape is modest in scale but active in development. Established ethanol and biodiesel plants continue to supply niche markets, while renewable diesel and SAF projects are progressing through early stages of commercialisation. The next few years will determine whether Australia expands into domestic production of advanced fuels or continues largely as a supplier of raw feedstocks to international refiners.

Government Policies and Programs in Australia

A range of federal and state initiatives now shape the environment in which Australia's biofuels industry is developing. These policies do not form a single national framework, but together they influence investment signals, feedstock economics, project feasibility and the location of emerging refining capacity.

Federal initiatives

Various federal initiatives have been established in connection with Australia's 2035 emissions reduction target and Net Zero Plan[6], including the Transport and Infrastructure Net Zero Roadmap and Action Plan[7].

Cleaner Fuels Program

Announced in September 2025, the A$1.1 billion Cleaner Fuels Program[8] provides a structured pathway for companies to apply for grants and co-investment to support early-stage projects in renewable diesel, SAF and other LCLFs. It focuses on feasibility work, engineering studies and early commercialisation rather than mandating biofuel use.

Future Made in Australia (FMIA)

Future Made in Australia is a broad national industrial policy focused on domestic manufacturing, regional investment and supply-chain resilience. Although not specific to biofuels, several FMIA streams – such as support for regional energy hubs, feedstock processing and low-carbon industrial development – intersect with areas relevant to renewable diesel and SAF proposals, especially where projects aim to process Australian feedstocks locally rather than export them. Grants and support programs can be used to support LCLFs, such as ARENA's Future Made in Australia Innovation Fund[9].

Australian Sustainable Finance Taxonomy

The Taxonomy is a voluntary classification framework being developed by the Australian Sustainable Finance Institute (ASFI) in partnership with the Federal Treasury. It is designed to help investors, lenders, super funds and companies identify which economic activities can be considered green or transition-aligned. The Taxonomy sets emissions-based criteria for transport fuels, meaning fuels must demonstrate verified lifecycle emissions reductions to qualify. For biofuels, this matters because projects with strong lifecycle performance could gain clearer access to sustainability-linked finance, green or transition loans or concessional capital. It also provides guidance for entities making investment decisions.

State Initiatives

New South Wales

NSW has outlined its strategy encompassing actions including A$130 million via its Net Zero Manufacturing Initiative, and A$40 million in Industrial Decarbonisation for biomethane and renewable diesel.[10]

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[6] Net Zero Plan - DCCEEW
[7] Towards net zero for transport and infrastructure | Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
[8] Cleaner Fuels Program: Powering low carbon liquid fuel production in Australia | Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
[9] Future Made in Australia Innovation Fund - Australian Renewable Energy Agency (ARENA)
[10] NSW Renewable Fuel Strategy | NSW Climate and Energy Action

Queensland

Overall Queensland has proposed a number of major initiatives and partnerships to progress development of a biofuels industry (including SAF) in conjunction with the agriculture sector, with an aim of boosting output to A$30 billion by 2030[11]. It also maintains an E10 ethanol mandate, underpinning much of Australia's ethanol demand.

Queensland's large sugarcane industry also positions the state as a natural location for Alcohol-to-Jet (ATJ) proposals, and several projects are exploring sugar-based or ethanol-based pathways for SAF.

Western Australia

WA has recently announced its A$1.2 million Advanced Biofuels Strategy to support state-based initiatives,[12] acknowledging the role biofuels play in decarbonisation of the mining, agriculture, transport and aviation sectors. Mining companies have conducted structured trials using imported HVO, and state agencies have examined the feasibility of local refining as part of regional energy and industrial-transition planning, particularly in the Pilbara and Kwinana industrial areas.

Victoria and South Australia

Both states are assessing ways to expand local oilseed-crushing and processing capacity, reflecting rising domestic demand for canola oil, meal and industrial uses. Increased local crushing would reduce reliance on whole-seed exports and could, over time, improve access to domestically processed oils that are suitable for renewable-fuel production.

Alongside this, both states are exploring opportunities to turn forestry and agricultural residues into renewable liquid fuels. In Victoria, several industry–government research partnerships are examining technologies that convert sawmill waste, plantation offcuts and other residues into synthetic liquid fuels for use as renewable diesel or SAF. In the Green Triangle region (spanning south-east South Australia and south-west Victoria), similar feasibility work is underway through bioenergy and circular-economy programmes linked to the forestry sector, which produces large quantities of residue material. These studies are early stage, but they reflect growing interest in using regional waste streams to support future renewable-fuel industries.

Summary

Although the different state measures operate independently, collectively they indicate that advanced biofuels and other LCLFs are increasingly considered part of Australia's long-term energy, industrial and regional-development planning.

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[11] Biofuels | State Development, Infrastructure and Planning

[12] Biofuels strategy to help WA capitalise on industry opportunities | Western Australian Government

Industry Partnerships and Project Activity

Biofuels development in Australia is increasingly being shaped by partnerships between airlines, fuel suppliers, investors, technology companies and regional industries.

Because advanced biofuels require new supply chains, new refining capacity and long-term offtake agreements, collaboration across sectors is becoming essential. The examples below illustrate how industry alignment is beginning to form around domestic SAF and renewable-diesel opportunities.

Jet Zero Australia – Project Ulysses

Project Ulysses is one of Australia's most advanced SAF proposals. It aims to produce SAF using LanzaJet ATJ technology, a process that converts ethanol into SAF by removing water and upgrading the molecules to meet aviation specifications. The project is backed by partners including Qantas, Airbus and Idemitsu, and has awarded a Front-End Engineering Design (FEED) contract to Technip Energies. Its progress demonstrates increasing coordination between airlines seeking supply, investors providing capital and technology developers offering proven commercial pathways.

Qantas and Ampol

Qantas has partnered with Ampol to assess how domestic SAF supply chains could work in practice, including blending, certification, logistics and airport distribution. The partnership reflects the reality that airline commitments to SAF require close involvement from Australia's major fuel suppliers and infrastructure operators. Other Australian airlines are also exploring SAF procurement and trial opportunities, reinforcing the role of airline demand in shaping future supply chains.

Manildra Group

Manildra, one of Australia's largest ethanol producers, continues to supply both fuel and industrial markets and is examining opportunities associated with ATJ pathways. With long-standing expertise in fermentation and established feedstock networks, the company is well positioned to supply ethanol or intermediates if ATJ production scales in Australia.

GrainCorp

GrainCorp is a central player in Australia's emerging renewable-fuel supply chain through its oilseed-crush plants at Numurkah (Vic) and Pinjarra (WA) and its east-coast storage and export network. It produces canola oil and meal for food and feed markets, with canola oil increasingly exported as feedstock for renewable diesel and SAF into Asia, Europe and North America. GrainCorp has highlighted continued demand for Australian canola oil from renewable fuel producers and is engaged in supply-chain discussions with domestic renewable diesel and SAF developers. More recently, GrainCorp has announced a joint initiative with Ampol and IFM to explore the creation of an Australian renewable fuels industry, reflecting growing interest in linking oilseed processing, refining capability and long-term institutional capital.[13]

Temasek and GenZero

Singapore's state-owned investment company Temasek and its decarbonisation investment platform GenZero have become active backers of global SAF and renewable-fuel ventures.[14] Their growing role in Asia-Pacific low-carbon fuels makes them relevant to Australian developers seeking capital, regional partnerships or future offtake into Asian aviation hubs.

Start-ups and new technology developers

Alongside large companies, a second wave of innovation is emerging from start-ups and early-stage firms working on alternative SAF pathways, biomass-conversion technologies, waste-to-fuel systems and lifecycle-emissions verification tools. Globally, large energy companies and airlines increasingly partner with or acquire these start-ups rather than develop new technologies in-house. This model is beginning to appear in Australia, contributing to a more diverse and competitive project pipeline.

Alongside these projects, a range of regional and consortium-based initiatives are emerging to support future SAF and renewable-fuel production. In Western Australia, Project Wheatbelt is exploring how large-scale agricultural and native plantation feedstocks and export infrastructure could support domestic fuel production, while industry groups are working to coordinate airlines, fuel suppliers, producers and governments around common standards and investment pathways.[15] In parallel, forestry-based projects such as the HAMR Energy proposal at Portland (Vic), which is focused on converting forestry residues into renewable fuels, supported by OneFortyOne's plantation assets, highlight how residues from existing regional industries could underpin alternative low-carbon fuel pathways over time.

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[13] https://www.graincorp.com.au/news/media-releases/ampol-ifm-and-graincorp-to-explore-australian-renewable-fuels-industry

[14] https://www.genzero.co/our-focus/sustainable-aviation-fuel

[15] Project Wheatbelt and other industry groups involve a range of industry, government and financial-sector participants, noting that ANZ is involved in Project Wheatbelt.

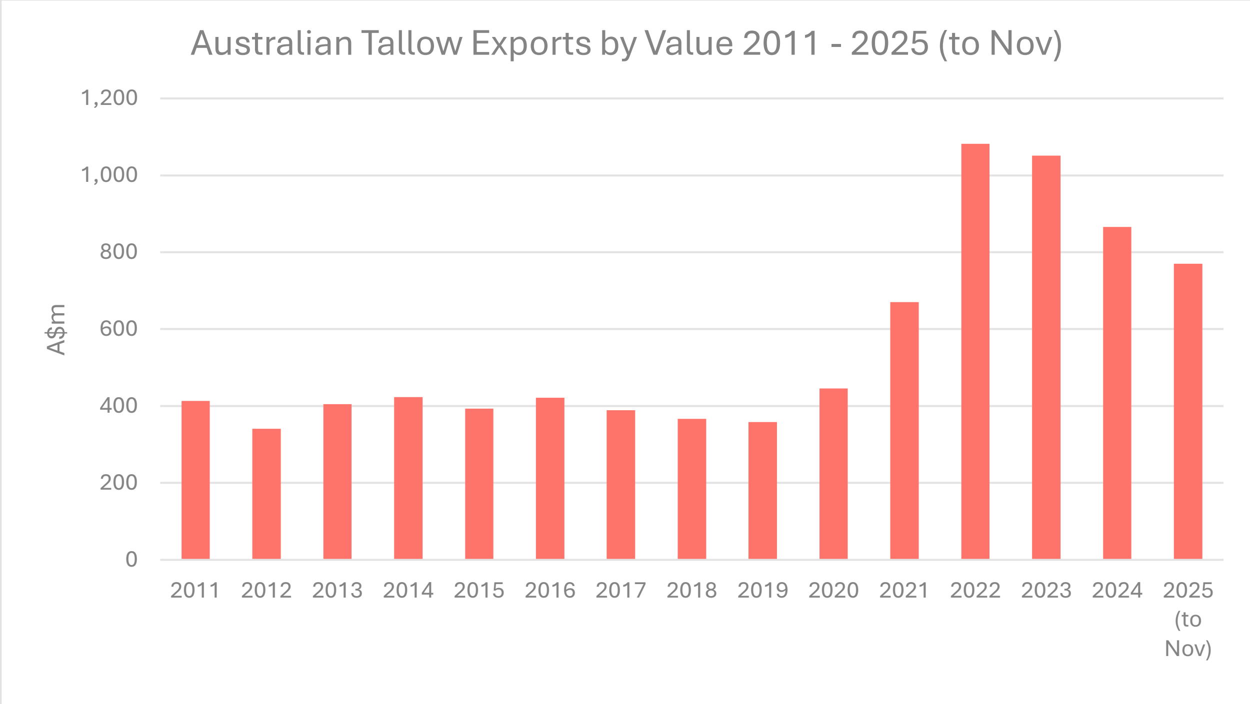
Biofuel Feedstocks: Scale, Competition and Long-Term Options

Biofuels depend on secure, large-volume and long-term feedstock supplies. Australia is well positioned in oilseeds, tallow and sugar, yet most of these materials already serve established export markets. As global demand for renewable diesel and SAF increases, competition for feedstocks is tightening. Any future domestic refining capacity will require long-term contracts, new processing investment and efficient logistics linking projects to regional production zones.

Tallow and used cooking oil (UCO)

Tallow is produced when beef and sheep processors render leftover fatty tissue into a clean, uniform fat. Used cooking oil is collected from restaurants and food manufacturers and consolidated by recycling contractors. Australia exports significant volumes of both, mainly to Singapore, Europe and the United States, where renewable-diesel and SAF refineries pay premium prices for waste-derived feedstocks with strong lifecycle-emissions profiles.

This trade delivers solid returns for processors, renderers and UCO collectors but raises feedstock costs for domestic projects and limits local availability. Any Australian plant relying heavily on these materials would need to compete with established international buyers or turn to alternatives such as canola oil, sugarcane-derived ethanol or residue-based pathways.



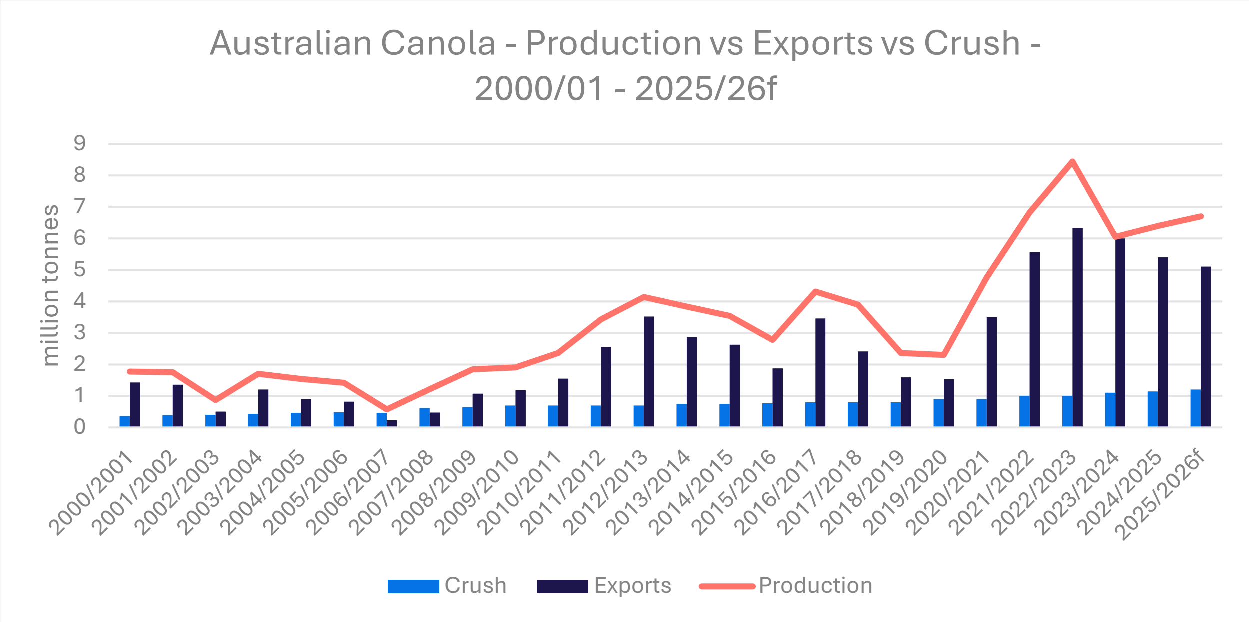
Source: ABS, ANZ

Tallow - a major feedstock suitable for existing renewable diesel and SAF production pathways, alongside used cooking oil - has become far more valuable in export markets, with Australian export values jumping sharply from 2021 and peaking above A$1 billion in 2022–23. The surge shows how quickly global renewable diesel and SAF demand can pull limited feedstocks offshore, tightening supply and lifting costs for any domestic biofuel industry that relies on the same inputs.

Canola and other oilseeds

Australia produces around 6 to 7 million tonnes of canola a year and is one of the world's largest exporters, with roughly 70 percent shipped as whole seed. Much of the canola exported to Europe is crushed for renewable diesel and biodiesel production under European Union renewable energy policies. Smaller volumes serve food and feed markets across Asia and the Middle East.

Domestic crushing capacity is limited – under 2 million tonnes annually – and focused mainly on food-oil and stockfeed markets. Expanding crushing would increase supplies of Australian-produced canola oil suitable for renewable diesel or SAF while generating additional protein meal for livestock industries. Several feasibility studies are exploring this option in eastern Australia.



Source: USDA, ANZ

Canola underpins Australia's current biofuel potential, with production rising strongly over the past decade and supplying a growing pool of oil suitable for renewable diesel and SAF. The chart shows that exports continue to absorb most output, while domestic crushing grows slowly, reinforcing that biofuels scale will depend on onshore processing rather than crop availability.

Sugarcane and grains

Sugarcane underpins Queensland's ethanol industry and remains one of Australia's strongest options for ATJ fuels. Brazil provides an example of scale, producing 25 to 30 billion litres of ethanol annually from more than 600 million tonnes of cane. Australia crushes roughly 28 to 32 million tonnes of cane each year, producing 4 to 4.5 million tonnes of raw sugar.

Since the same sugarcane cannot be used twice, large increases in ethanol or ATJ fuel production would require diverting a share of cane away from sugar production. More limited volumes of ethanol can be produced from molasses and other liquid by-products of sugar manufacturing, while fibrous residues such as bagasse represent a longer-term feedstock option through advanced conversion technologies. Using a greater share of cane, molasses or by-products for fuel production could diversify mill revenue and support regional economies.

Grains such as wheat and sorghum can supplement ethanol plants, though availability varies with seasonal production, export demand and relative prices in food and feed markets.

Forestry and agricultural residues

Australia generates large volumes of residues from forestry and agriculture, including offcuts, sawdust, bark, crop stubble and orchard prunings. Emerging technologies can convert this biomass into liquid renewable fuels such as renewable diesel or SAF.

Residue-based fuels avoid competition with food markets and could support significant long-term volumes, particularly for SAF. Their challenge is scale: residues are dispersed, costly to collect and require capital-intensive plants. Robust supply-chain design will be essential if these opportunities are to develop in Australia.

Summary

As biofuel demand grows, questions are also being raised about competition between fuel, food and feed uses for agricultural commodities, as well as other land uses, such as those required for solar energy. While waste-based feedstocks and residues avoid many of these concerns, increased use of edible oils and crops can influence domestic prices and land-use decisions. These issues reinforce the importance of clear sustainability standards, lifecycle emissions assessment and a diversified feedstock mix if biofuels are to scale without unintended consequences.

Global Policy Signals

Global policy settings are now among the strongest forces shaping Australia's biofuels outlook. Mandates and incentives in larger markets influence feedstock prices, trade flows and investment decisions, and help determine whether Australian material is exported as feedstock or refined locally into finished fuels.

Asia

Across Asia, biofuels support energy security, emissions reduction priorities and domestic agriculture. Indonesia operates at B35 (35 percent biodiesel in diesel) and is assessing higher blends. Malaysia mandates B10 nationally and B20 in selected regions. These initiatives create some of the world's largest biodiesel markets.
Singapore has become a major hub for renewable-diesel and emerging SAF production, drawing in feedstocks such as UCO, tallow and vegetable oils from around the region, including Australia. Japan and South Korea are developing SAF certification, lifecycle-emissions standards and early procurement structures. Both are expected to rely heavily on imported SAF, increasing future demand for Australian feedstocks or finished fuels

Singapore will introduce a SAF levy on airline tickets sold from April 2026 for flights departing Singapore from October 2026. Revenue will fund SAF purchases, supporting an initial SAF share of around 1 percent of total jet-fuel uplift, with an indicative goal of 3 to 5 percent by 2030. The levy provides a predictable demand signal and is being closely observed by other aviation markets, including Australia.

Europe

Europe's policy framework remains one of the strongest global drivers of renewable fuels. The European Union's Renewable Energy Directive – now in its third version, RED III – requires member states to expand renewable energy in transport and comply with detailed sustainability and certification requirements.

For aviation, the ReFuelEU Aviation regulation sets binding minimum shares of SAF at EU airports, starting at 2 percent in 2025, rising to 6 percent in 2030, 20 percent in 2035 and reaching 70 percent by 2050, with intermediate targets in 2040 and 2045.[16] Because mandated SAF growth under ReFuelEU is driven by the advanced SAF sub-target, crop-based oils such as canola cannot be used to meet mandated SAF volumes and therefore play little to no role in mandated SAF markets. Europe is also a major buyer of Australian canola, much of which is crushed and used in biodiesel and renewable diesel under EU rules.

As mandated SAF growth in Europe and the UK is concentrated in advanced, waste- and residue-based pathways, these fuels typically attract stronger price premiums and longer-term offtake commitments than crop-oil-derived alternatives. As a result, European policy influences Australian farmgate pricing and affects how much canola oil or seed could be available for potential domestic refining.

United States

The United States (US) is one of the world's largest and fastest-growing markets for renewable diesel and SAF, driven heavily by federal incentives. Since the passage of the Inflation Reduction Act in 2022 – alongside existing measures such as the Renewable Fuel Standard (RFS) and California's Low Carbon Fuel Standard (LCFS) – the US government has offered substantial credits for low-carbon fuels with strong lifecycle-emissions performance, including the new Clean Fuel Production Credit. These policy settings have encouraged many refineries to convert units to renewable diesel and SAF production and supported construction of new dedicated plants. Within these frameworks, fuels produced from waste- and residue-based feedstocks attract materially stronger incentives than crop-oil-derived alternatives, reinforcing investment in advanced and cellulosic fuel pathways.

While parts of the Inflation Reduction Act have since been amended or faced greater political and legal uncertainty, the incentives introduced earlier in the decade have already reshaped investment decisions and refinery capacity across the US renewable fuels sector.

This expansion has sharply increased US demand for waste-based feedstocks such as UCO, tallow and specific vegetable oils. Australia exports significant volumes of these materials, so higher US demand has created attractive market opportunities. It has also lifted global feedstock prices, increasing costs for any future Australian renewable-diesel or SAF projects relying on the same inputs.

Summary

Global policy settings are now among the most important forces shaping biofuel markets. Mandates and penalties in Europe and the UK, alongside incentives in the United States, are influencing demand, pricing and investment in renewable fuels and

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[16] https://www.easa.europa.eu/en/domains/environment/eaer/sustainable-aviation-fuels

associated technologies. Together, these settings are driving growing international demand for Australian feedstocks and, over time, potential exports of renewable fuels.

At the same time, stronger global demand is intensifying competition for feedstocks and lifting input costs, with feedstocks typically accounting for up to 80 percent of current biofuel production costs. Over the longer term, some of this pressure may be eased by the commercialisation of emerging processing technologies capable of using a wider range of waste and agricultural residue streams available in Australia.

Any move to develop domestic refining capacity will therefore need to be informed by international policy dynamics as closely as local conditions.

Sustainable Aviation Fuel (SAF): A Growing Global Market

Sustainable Aviation Fuel is forecast to become one of the world's fastest-growing energy markets over the next two decades. Supply remains small today, but several features make SAF central to aviation's decarbonisation plans.

Multiple production pathways

SAF can be produced from waste oils and fats (through the Hydroprocessed Esters and Fatty Acids process, or HEFA), from ethanol made using sugar or grain (ATJ), and from municipal waste, agricultural residues and forestry residues. This diversity allows projects to draw on a wide range of feedstocks. These pathways continue to evolve, with newer configurations generally aiming to deliver lower lifecycle emissions through improved feedstock selection, process efficiency and energy inputs.

Ready for today's aircraft and airports

SAF is a "drop-in" fuel - it can be blended with conventional jet fuel and used in existing aircraft, pipelines, storage tanks and refuelling systems without modifying engines or airport infrastructure.

Strong corporate and airline demand

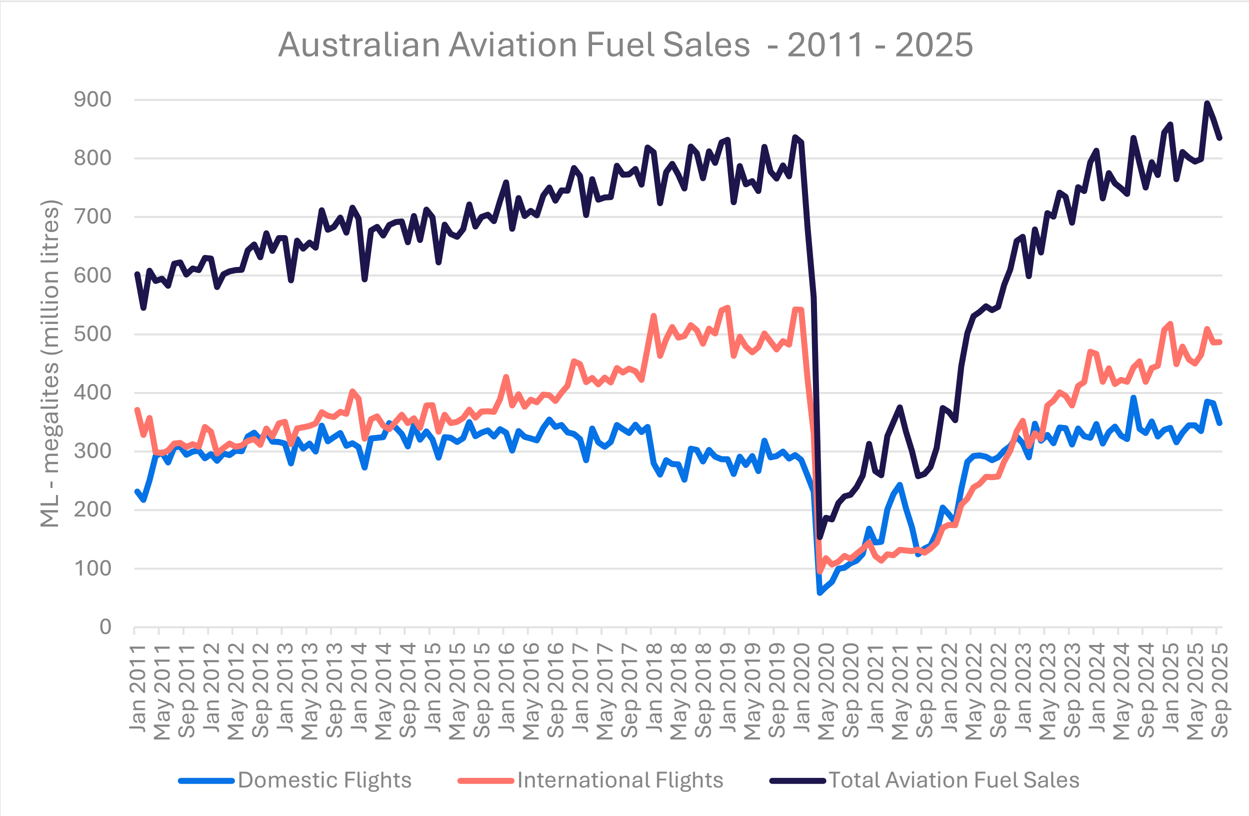
Airlines around the world – including Qantas, Singapore Airlines, Emirates and several US and European carriers – have announced goals for increasing their use of SAF in 2030 and beyond. Many large companies now also purchase SAF or SAF credits via business-travel and freight programmes to reduce the emissions associated with their air operations.

Growing policy momentum

Governments are strengthening policy support through a mix of mandates and incentives. Europe has introduced rising mandatory SAF blends at its airports, the United States offers substantial tax credits and other incentives that vary by feedstock type and lifecycle emissions, and Singapore has established a SAF levy to fund guaranteed SAF purchases. Together, these measures create predictable long-term demand signals that support investment in new production.

Australia's opportunity

Australia has strong feedstock industries and emerging partnerships between airlines, technology providers and project developers. With competitive access to feedstocks, sufficient refining capacity and robust certification systems, Australia could position itself as a regional supplier of SAF in the 2030s.



Source: Australian Petroleum Statistics 2025 (DCCEEW), ANZ

Aviation fuel use in Australia has recovered strongly from the pandemic shock, with international volumes again accounting for the bulk of growth in total jet fuel demand. This matters for biofuels because aviation offers limited decarbonisation options, placing growing pressure on SAF to deliver meaningful emissions reductions at commercial scale.

Where Biofuels Fit Beyond Aviation

Aviation attracts much of the public attention, but several other sectors offer earlier and potentially larger opportunities for renewable diesel and biodiesel. These industries depend heavily on liquid fuels and often have limited near-term electrification options, making biofuels a practical bridge during the transition to lower-emissions energy.

Heavy transport

Long-haul trucking requires vehicles to travel long distances, carry heavy loads and refuel quickly. Trials in Australia, Europe and the US show that renewable diesel delivers the same power, torque, fuel economy and reliability as fossil diesel in modern engines. Because renewable diesel can be used without altering engines, fuel tanks or depot systems, it allows trucking fleets to reduce emissions without changing existing equipment or operations. Electric heavy trucks are emerging, but most are currently suited mainly to shorter-range, urban or regional routes where frequent charging is possible.

Agriculture

Farm machinery such as large tractors, harvesters and sprayers must work for many hours at a time and provide high pulling force to move soil, tow machinery or lift loads. These demands remain challenging for current battery systems, which would require very large, heavy battery packs and long charging times. Renewable diesel can be used immediately in existing machinery, offering a straightforward way for farmers to cut emissions. Smaller farm machines – such as compact tractors, utility vehicles or equipment that can return regularly to a depot – are beginning to electrify, but larger equipment remains dependent on liquid fuels for now.

Mining

Mining is one of Australia's largest users of diesel. Haul trucks, loaders and drilling rigs operate for long hours in remote environments, often far from electricity infrastructure. Trials of renewable diesel in heavy mining equipment have generally shown comparable engine performance, no noticeable loss of power and similar maintenance requirements to conventional diesel.

Alongside biofuels, electrification is beginning to emerge in parts of the sector. Several miners are now trialling battery-electric haul trucks and support equipment, helped by improvements in battery density and charging systems. Early deployments are typically in controlled environments or shorter-cycle haul routes, while trolley-assist systems - where trucks draw power from overhead lines during uphill sections - are also being expanded on some international and Australian sites.

For most operators, these technologies sit within a broader decarbonisation toolkit that also includes green hydrogen pilots, hybrid drive systems and renewable diesel. The mix adopted will continue to vary by site design, grid access, ore body, customer expectations and the economics of each option.

Marine operations

Marine fuel use spans coastal freight vessels, fishing fleets, harbour tugs, pilot boats and some ferries, and many engines can operate on renewable diesel or biodiesel blends with little or no modification. Interest in these fuels is increasing as international maritime rules tighten, particularly through the International Maritime Organization, which has already implemented the global sulphur cap and efficiency and carbon-intensity rules for existing vessels. A broader set of long-term greenhouse-gas measures has been delayed, creating uncertainty over the next phase of requirements, but the overall direction remains toward lower-emission fuels. Australian ports and operators are responding by exploring options that reduce local air pollution and help vessels stay aligned with evolving global compliance standards.

Industrial and off-grid uses

Outside transport, biofuels have important roles in stationary energy and industrial supply chains. Ethanol continues to support pharmaceuticals, food processing and industrial solvent production. Renewable diesel can power backup generators, mobile construction equipment and off-grid industrial sites that currently rely on diesel.

Economic Considerations and Supply Chain Costs

The growth of biofuels raises wider economic questions for supply chains, particularly in sectors where fuel is a significant share of operating costs. If supermarket distribution fleets, freight operators, airlines or mining companies begin using renewable diesel or SAF at prices above conventional fuels, those extra costs could be absorbed by operators, shared with customers or passed through to end consumers. The outcome depends on commercial contracts, competitive pressures and how each supply chain is structured.

Governments and companies globally are testing different ways to manage or share these costs:

- **SAF levies** (such as Singapore's) do not lower costs but make them more transparent by showing passengers what portion of a fare funds SAF purchases.
- **Emissions-linked contracts** allow freight customers to pay an agreed premium in return for documented lower-emissions transport.
- **Green premiums** occur where customers choose to pay more for lower-emissions travel or freight, including airline programs that allow passengers to pay a premium linked to emissions reduction.
- **Blended-finance models** combine public, private and/or philanthropic capital to reduce early project costs or help first-of-kind plants reach bankability.

In Australia, early feasibility work and project assessments suggest that the overall cost of biofuels will depend heavily on:

- **Feedstock prices** – often the largest component of production cost, especially for tallow, UCO and vegetable oils that are strongly influenced by global markets.
- **Domestic refining capacity** – importing finished LCLFs can be costly, but building local plants requires large upfront investment and patient capital.
- **Long-term offtake agreements** – firm commitments from airlines, freight operators or miners can lower investment risk, reduce financing costs and improve project economics.

A further challenge for next-generation biofuel projects is the lack of stable, long-term pricing structures to support large upfront investment. For many renewable diesel and SAF proposals, the lack of reliable long-term feedstock pricing and supply commitments makes it difficult to justify capital-intensive investment without additional risk-sharing mechanisms. At the same time, there are no widely accepted long-term pricing indices for advanced biofuels, and buyers have generally been reluctant to enter into long-term fixed-price offtake agreements. As a result, a significant share of price risk remains with project developers, increasing financing costs and slowing investment decisions.

Recent project cancellations and delays globally have underlined these challenges. Even well-capitalised energy companies have paused or abandoned biofuel investments where cost structures, feedstock access or long-term pricing could not be made competitive with alternative fuels, highlighting the sensitivity of first-of-kind projects to market and policy conditions.

Clear, stable policy settings matter because they reduce uncertainty for investors. When investors can assume that regulations, blending expectations or emissions frameworks will remain broadly consistent – or at least on a clearly defined emissions reduction trajectory – over the life of a plant, they are more willing to fund projects at lower required returns. This can narrow the price gap between biofuels and conventional fuels in hard-to-abate sectors.

Beyond direct fuel costs, several broader economic factors will also shape how biofuels develop in Australia. Some present opportunities, while others highlight areas that will require careful consideration.

Regional economic development
Biofuel plants located near feedstocks could support regional jobs and value-adding industries, whilst potentially supporting workforce transition in regions affected by climate and energy policy shifts. At the same time, communities and regulators will weigh issues such as water use, land availability, waste management and long-term project viability.

Trade balance and onshore value-adding

Producing more fuels domestically could reduce reliance on imported refined fuels and keep more value onshore. However, Australia currently earns strong export income from selling feedstocks into high-value overseas markets. Any shift toward domestic refining would need to account for foregone export earnings and new market risks.

Infrastructure investment

New blending, storage and distribution infrastructure - particularly at airports for SAF and at fuel terminals for renewable diesel - will require substantial capital. A central question is how costs are shared between fuel suppliers, airlines, airports, governments and end consumers.

Agricultural price and land-use dynamics

Higher demand for some biofuel feedstocks may benefit growers and processors through new revenue streams. The downside is the potential for higher domestic prices for some food and feed inputs, or greater competition for land, water and crop choices in certain regions.

Technology and scaling risk

First-of-kind renewable diesel and SAF plants are expensive, and early technologies carry technical and financing risk. Developers must navigate uncertain future policy settings, evolving international standards and competition from other decarbonisation options such as green hydrogen[17] or electrification[18], or even nature-based carbon removals. Managing these risks is central to project bankability and typically relies on a mix of policy settings, long-term offtake agreements and risk-sharing mechanisms.

Long-term competitiveness

Australia's distance from markets, labour costs and construction costs mean that biofuel producers and investors operating in Australia must compete with large plants in the United States, Europe and Asia. This raises a longer-term strategic question: whether Australia seeks primarily to be a refiner of advanced biofuels, an exporter of feedstocks, or some mix of both.

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[17] The ANZ Hydrogen Handbook 2.0 | ANZ

[18] ANZ EEC Forgotten Fuel series | Energy efficiency insights | ANZ

Conclusion – Choices for the Next Decade

Australia has many of the fundamental ingredients needed to participate more fully and play a larger role in the next wave of renewable diesel and SAF development, underpinned by diverse feedstocks across vast and well-established agricultural and forestry industries, growing urban and process bio-waste sources, established industrial capability and growing partnerships between airlines, fuel suppliers and regional producers. At the same time, most of the value created by low-carbon fuels is still captured offshore, as Australian feedstocks are shipped to refineries in larger markets.

Over the next decade, outcomes will depend on a combination of technology adaptation, policy choices and stability, domestic refining capacity, infrastructure investment and offtake models. Those choices will shape whether Australia continues mainly as a crop and tallow feedstock exporter or develops a larger role in producing premium advanced and cellulosic biofuels, or settles somewhere in between. For investors, producers, transport operators and policymakers, biofuels remain one option within a broader mix of decarbonisation approaches. The opportunity lies in using Australia's agricultural and industrial strengths to build fuel supply chains which enhance energy security and regional development, while carefully managing costs, trade-offs and long-term competitiveness.

Contact:

KAREN BROWN
Head of Climate Transition, Diversified Industries, Institutional
T: +61 466 870 473
E: karen.brown@anz.com

MICHAEL WHITEHEAD
Executive Director, Food, Beverage and Agribusiness Insights, Institutional
T: +61 401 097 382
E: michael.whitehead@anz.com

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