

Australia

What is the outlook for aviation through 2050?



Learn about
Cascade



2.7%

The Australian Bureau of Infrastructure and Transport Research Economics (BITRE) predicts 2.7% traffic growth per year through 2050.²

3x

CO₂ emissions in 2050 could almost triple to 65 MtCO₂-eq without improvements in aircraft, operations, and use of renewable energy.

13.8 billion

litres of SAF
could reduce
emissions by

50%

The 2023 Boeing-CSIRO SAF Roadmap concludes 85% of jet fuel demand in Australia could be met by locally produced sustainable aviation fuel (SAF) in 2050.³

80%

Approximately 80% of aircraft CO₂ emissions in Australia come from flights over 1,500 km for which there is no feasible alternative mode of transport.¹

Visualize Roadmaps in Cascade

Explore the Boeing-CSIRO SAF Roadmap scenario to evaluate how much SAF will be required, then adjust assumptions to build your own forecast.

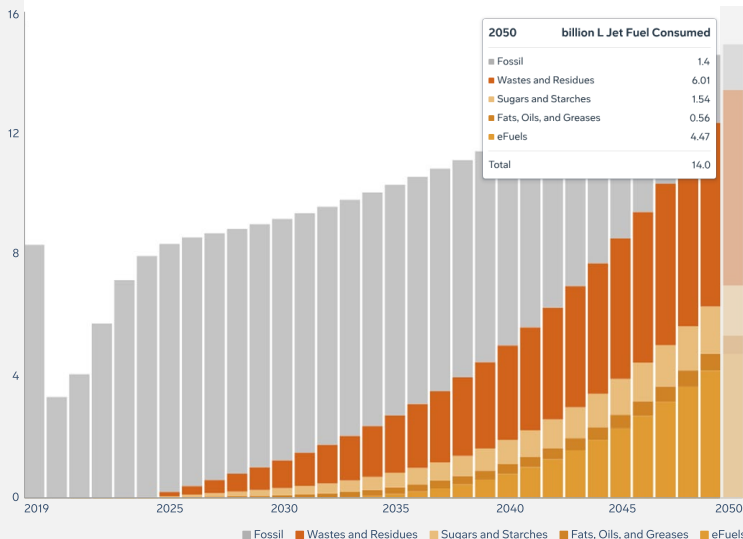
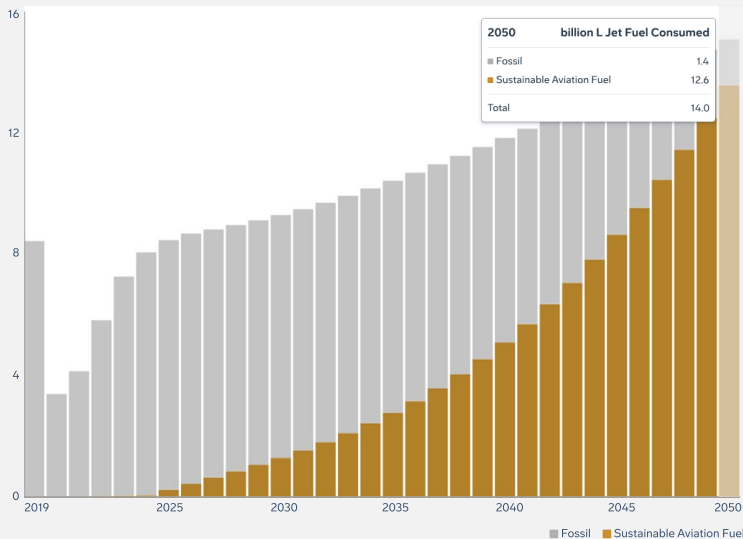


Click here
to start



Jet Fuel Consumption (billion litres)

Total jet fuel consumption, including conventional jet fuel and SAF



Turn Insights into Action



Australia holds significant potential for SAF production, however effective policy measures are needed to steer investment and unlock national energy resilience.

Benefits of Action

HIGH Ambition Scenario

Conventional Jet Fuel Market Share of 10%

12.6

billion L of SAF

- Significant investment and economic opportunity:** By utilising the feedstock modelling from this scenario, this opportunity equates to \$19 billion worth of fuel by 2050.³
- Increased energy security:** Converting locally sourced biomass into SAF reduces dependence on imported fossil fuels and ensures a stable, renewable energy supply for the aviation sector.
- Jobs:** The bioenergy sector in Australia has the potential to create 26,000 new jobs.⁵

Cost of Inaction

LOW Ambition Scenario

Conventional Jet Fuel Market Share of 92%

1.12

billion L of SAF

- Australia loses valuable feedstock offshore:** Of the 4.5 million tonnes of canola grown annually, only 30% is processed locally while 70% is exported, with 75% of that being processed into biofuels abroad.⁶
- Heavy reliance on imports:** Australia imports 90% of its liquid fuels, including jet fuel, through long supply chains vulnerable to geopolitical and climate risks, making the nation dependent on foreign-produced SAF.³
- Missed opportunities:** Significant economic benefits such as job creation could be achieved with Australia's bioenergy potential.

Click [here](#) to learn about the modeling methodology used in Cascade and see the assumptions of this scenario on the following page.

Boeing's Efforts in Australia

 **Policy**

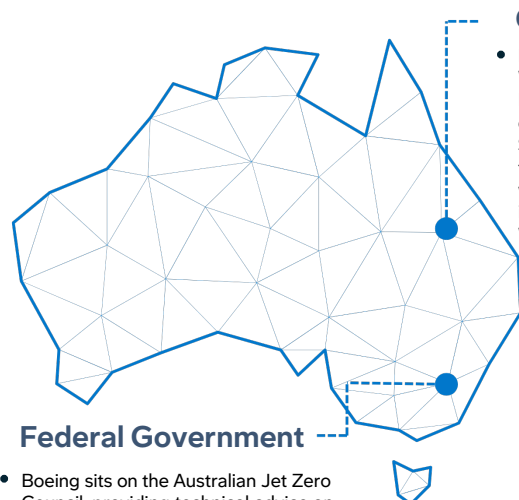
- Leading domestic and global advocacy efforts on scopes 1 and 3 SAF accounting
- Driving thinking on SAF as a sovereign risk mitigation measure for Australia
- Supporting state and territory policy action for SAF uptake

 **Partnerships**

- Collaborating with Virgin Australia and Qantas in five areas critical for aviation decarbonisation: Traffic, Aircraft, Operations, Energy, and Carbon Offsets & Removals
- Forging industry partnerships to further develop the technology, use and scale of SAF
- Collaborating with CSIRO and academia on techno-economic research

 **Positioning**

- Presenting and engaging in thought leadership activities, including SAF State of Play Report
- Engaging with the private finance sector, including through capacity building and finance roundtables
- Facilitating international connections and collaboration opportunities



QLD

- Boeing invested in Wagner Sustainable Fuels to support the development of its SAF production facility in Brisbane, as well as blend imported SAF at its Wellcamp facility.

Federal Government

- Boeing sits on the Australian Jet Zero Council, providing technical advice on optimum policy for aviation
- decarbonisation.
Boeing leads a workstream on SAF accounting, with Virgin Australia and Qantas.

Scenario Assumptions

- Australian domestic and international departures only.
 - Moderate traffic growth of 3.0%, basing off the ~2.7% prediction from BITRE².
 - Fleet Renewal assumptions have been set to 'HIGH' for this Australian-specific scenario (phase out time has been set to 15 years), as the current Australian fleet age is older than the global average. BITRE reported in 2021 that the average age for VH-registered aircraft was 11.7 years for international aircraft and 19.3 years for domestic⁴. IATA reports the average aircraft age is 11.6 years, but approximately 60% of the global fleet is younger than this mean age⁷.
 - IEA Net Zero Emissions scenario for electricity. The Australian Government's emissions reduction targets are 43% by 2030 and net zero by 2050, as detailed in the national Net Zero Plan⁸.
 - The ambition level for hydrogen as a renewable energy source is set to 'MODERATELY HIGH'. The Australian Government has committed to becoming a global leader in hydrogen. Alongside renewable electricity, hydrogen is expected to play a pivotal role in decarbonising the Australian economy. Notably, Australia has more green hydrogen projects under development than any other country⁹.
 - 'MODERATE' Operations assumptions. 85.1% Passenger Load Factor in 2050
 - Well-to-wake emissions scope
 - 'LOW' levels of 'Advanced Conventional' technology insertion into Australia, including no hydrogen or electric aircraft.
 - The market shares for SAF feedstocks have been directly derived from the predictions outlined in the 2023 Boeing CSIRO Sustainable Aviation Fuel Roadmap³. According to the report, Australia is projected to have sufficient feedstocks to produce 60% of its local jet fuel demand using biogenic sources, increasing to 90% by 2050 as these sources expand and hydrogen production scales up. Notably, sugarcane and sorghum are expected to contribute increasingly to Australia's fuel supply over time, a unique advantage for the region. All feedstock carbon intensity values are calculated using the default values provided by Cascade. The percentages used in this scenario were recreated from the HIGH scenario listed in the Roadmap, with all percentages rounded to the nearest whole number. The LOW scenario listed below was used to generate the LOW scenario on the bottom left of the first page.
- Note: Novel Energy Crops are excluded, as the Roadmap did not specify these feedstocks in the report. The modelling assumptions in Cascade list Novel Energy Crops as miscanthus, switchgrass, poplar, willow, and eucalyptus. The report categorises tallow as a waste; however, in Cascade, tallow is classified under the Fats, Oils & Greases (FOG) category. This scenario treats tallow as a FOG.*

Source	Market Share % High Scenario <i>This scenario is the basis for the Cascade analysis presented in this document</i>	Market Share % Low Scenario <i>These are the MS percentages used in the 'LOW' scenario on the bottom left of the first page. Find the corresponding Cascade scenario HERE</i>
Conventional Jet Fuel	10%	92%
Fats, Oils & Greases	4%	1%
Sugars and Starches	11%	1%
Novel Energy Crops	0%	0%
Wastes & Residues	43%	5%
eFuels	32%	1%

1. Boeing and CSIRO. "SAF State of Play Report 2024." <https://www.boeing.com.au/content/dam/boeing/en-au/pdf/boeing-and-csiro-saf-state-of-play-report-2024.pdf>

2. Bureau of Infrastructure, Transport and Regional Economics (BITRE). "Summary Report: Aviation Emissions to 2050." <https://www.bitre.gov.au/sites/default/files/documents/bitre-rr157-summary.pdf>

3. Commonwealth Scientific and Industrial Research Organisation (CSIRO). "Sustainable Aviation Fuel Roadmap." <https://www.csiro.au/-/media/Energy/Sustainable-Aviation-Fuel/Sustainable-Aviation-Fuel-Roadmap.pdf>

4. Bureau of Infrastructure, Transport and Regional Economics (BITRE). "Australian Aircraft Activity 2021." <https://www.bitre.gov.au/sites/default/files/documents/australian-aircraft-activity-2021.pdf>

5. Australian Renewable Energy Agency (ARENA). "Australia's Bioenergy Roadmap 2021"

6. Infrastructure Australia. "GrainCorp Aviation White Paper 2023"

7. International Air Transport Association (IATA). "Chart of the Week: 8 Sep." <https://www.iata.org/en/iata-repository/publications/economic-reports/chart-of-the-week-8-sep/>

8. Department of Climate Change, Energy, the Environment and Water (DCCEEW). "Powering Australia." <https://www.dcceew.gov.au/energy/strategies-and-frameworks/powering-australia>

9. Department of Climate Change, Energy, the Environment and Water (DCCEEW). "Hydrogen." <https://www.dcceew.gov.au/energy/hydrogen>