



Jet Zero<sup>®</sup>

# JET ZERO PROJECT ULYSSES LESSONS LEARNT REPORT

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## PROJECT BACKGROUND

Since inception in 2021, Jet Zero has completed engineering studies, secured project sites, negotiated key commercial agreements, attracted strong strategic partners, investors and lenders, and today is progressing Front-End Engineering Design (FEED) activities with engineering and construction contractor (Technip) on Australia's first Alcohol to Jet (AtJ) Sustainable Aviation Fuel (SAF) project called Project Ulysses (the Project), named after the iconic North QLD butterfly.

The Project is a FOAK commercial scale 113 million litre per annum (ML pa) SAF and Renewable Diesel (RD) plant using AtJ technology. Located in the Cleveland Bay Industrial Park within the Townsville State Development Area, the Project intends to convert bioethanol from domestic agricultural by-products into SAF and RD.

The Project will pioneer the capturing of the economic benefits of a domestic SAF industry, which is expected to be worth \$13 billion annually and could create up to 18,000 jobs nationwide by 2040. It is also forecast to directly deliver ~1,000 construction jobs at its peak and more than 100 direct and indirect ongoing operational jobs for over 20 years to the Townsville regional economy.

Project Ulysses has strong supply chain linkages to other key domestic industries directly employing 350,000 workers and will deliver key demand and employment drivers across the agriculture, aviation, energy, defence and logistics sectors.

At completion, Ulysses will:

- Reduce jet aircraft CO<sub>2</sub> emissions by ~65% on a life cycle basis versus the equivalent fossil fuel;
- Produce 1/6th of the domestic airline industry's entire 2030 SAF commitment;
- Expand local industrial demand for the emerging Townsville renewable energy hub;
- Provide increased fuel security in a strategically important region;
- Secure a local supply of RD for the reef tourism, mining and transport sectors; and
- Position QLD as a world leader in the LCLF industry.

To-date, Jet Zero has successfully raised approximately \$60 million of private capital and \$15 million of public capital from funds and industry partners including Airbus, Qantas and Idemitsu, the Australian Federal Government through the Australian Renewable Energy Agency (ARENA), QLD State Government and the Singapore Government through Enterprise Singapore.

## EXECUTIVE SUMMARY

Jet Zero is developing Australia's first AtJ SAF project (Project Ulysses). As with any FOAK project, there are lessons learnt during the development phase.

Some of the key learnings for the Project to date have been technical and environmental in nature, notably:

1. Modularisation;
2. Front-End Value Engineering (FEVE); and
3. Sustainability and traceability of feedstocks.

Given the high capital expenditure (CAPEX) environment for infrastructure projects globally, Jet Zero is highly focused on reducing CAPEX and protecting the project schedule while ensuring a safe, operating facility over the long-term. This has led to a number of technical optimisation opportunities being explored, namely modularisation and FEVE. These opportunities will not be concluded until the end of FEED, but preliminary estimates suggest significant CAPEX savings can be realised.

The importance of sustainability credentials and traceability of feedstocks has also been a key learning. Jet Zero has engaged with a number of stakeholders in the SAF ecosystem and this has consistently been a top priority, in some cases more important than the cost of SAF. Jet Zero continues to work with offtakers and regulatory bodies to ensure the Project's SAF meets the highest sustainability, traceability and certification standards.

# LESSONS LEARNT

## Technical: Modularisation

Jet Zero is employing a modularisation strategy for Project Ulysses. Modularisation is considered to be a best-practice approach in analogous industries (e.g. oil and gas, refining) and the same principles can be utilised effectively for SAF projects.

Modularisation is a critical strategy in the delivery of large-scale infrastructure projects, offering significant benefits in reducing CAPEX, shortening project timelines, and mitigating execution risks. By shifting construction activities away from the final project site into controlled fabrication environments, modularisation enables greater efficiency, standardisation, and quality control.

From a cost perspective, modular fabrication delivers significant savings. By reducing reliance on a large on-site labour force, heavy equipment mobilisation, and prolonged site overheads, it lowers major cost drivers in project execution. Fabrication yards take advantage of economies of scale, streamlined production processes, and bulk procurement of materials, delivering modules at lower unit costs compared to conventional stick-built construction.

Schedule compression is another major advantage of modularisation. When modules are manufactured off-site in controlled facilities, civil works and site preparation can progress in parallel, compressing the overall project schedule. This overlap shortens the critical path, reduces exposure to delays and brings forward commissioning and start-up.

Risk reduction is also central to modularisation's value. Fabrication in controlled environments minimises exposure to weather and other site related delays, improves worker safety, and reduces the likelihood of rework due to inconsistent site construction practices. In addition, the standardisation of module construction improves predictability, making design, logistics, and installation more reliable.

Globally, infrastructure projects face increasing pressure to deliver faster, cheaper, and safer, modularisation provides a proven pathway. It not only optimises investment and execution but also enhances resilience against uncertainties, ultimately driving more sustainable project outcomes.



Figure 1: Example of modularisation  
<https://www.heavyliftnews.com/new-ethane-cracker-stoves-for-ineos-project-one-arrive-in-antwerp-out-of-the-mist/>



Figure 2: Technical render of Project Ulysses

### Technical: Front End Value Engineering

Value Engineering (VE) is a systematic approach applied during the Front-End Engineering Design (FEED) phase to optimise project outcomes by balancing functionality, cost, and performance. Its core purpose is not simply CAPEX reduction, but ensuring that every element of the design delivers maximum value relative to its cost and contribution to the overall project objectives.

VE is traditionally carried out at the end of FEED. However, given the rising cost of infrastructure projects globally, Jet Zero made the decision to bring this process forward, undertaking VE before entering the full FEED phase. This is referred to as Front-End Value Engineering (FEVE).

The benefits of undertaking FEVE at this early stage extend well beyond reducing capital expenditure. It compresses the project schedule by streamlining engineering and construction, improves operability and maintainability, and enhances safety outcomes. For example, removing unnecessary process flexibility and selecting modular construction methods (refer modularisation learning above) reduces both engineering and construction risks while maintaining technical integrity.

Importantly, FEVE provides a structured forum for collaboration among engineering, operations, procurement, and construction teams. This cross-functional approach ensures that optimisation decisions consider lifecycle costs and long-term performance, not just initial capital outlay.

Completing FEVE ahead of full FEED phase should ultimately reduce the risk of costly design changes later in FEED and Execution. This improves predictability in cost and schedule, and ensures that project designs remain resilient, efficient, and aligned with stakeholder expectations.

During FEED, projects are still flexible enough to accommodate change without incurring the high costs of late design alterations. This means it is still possible to conduct further VE workshops, where multidisciplinary teams critically examine design assumptions, specifications, and proposed solutions. By challenging traditional practices and exploring alternatives, VE can identify opportunities to simplify designs, standardise equipment, or adjust specifications to meet functional requirements at lower cost.

### Environmental: Traceability and Sustainability

Jet Zero has conducted significant SAF industry stakeholder engagement. One of the consistent themes is the importance of traceability and the broader sustainability characteristics of feedstocks. For some stakeholders, this is more important than the cost of SAF.

Airlines are facing growing demands to prove that its emissions reductions are both genuine and credible. Traceability and robust sustainability credentials are essential for SAF because they ensure that every batch of SAF can be reliably tracked from its origin all the way to its final use, with independently verified data at every step. Achieving credible emissions reductions requires a robust lifecycle assessment, independent third-party certification, and strict adherence to recognised sustainability standards such as International Sustainability and Carbon Certification (ISCC) and Roundtable on Sustainable Biomaterials Association (RSB). Regulators and SAF buyers depend on sustainability certification schemes approved by International Civil Aviation Organization (ICAO) to ensure that every SAF batch not only delivers real emissions reductions but also meets international benchmarks like Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

Tracking the use of feedstocks for SAF is also critically important because feedstock origin determines the fuels environmental impact, eligibility for certification and compliance with international regulatory standards. SAF derived from unsustainable or poorly tracked feedstocks – such as those that cause deforestation or lack verifiable supply chain records – risks undermining both climate benefits and corporate reputations. As a result, airlines and investors prioritise assurance that SAF is produced from feedstocks with clear provenance, full lifecycle carbon accounting, and compliance with recognised certification schemes such as ISCC or RSB. Ultimately this transparency builds trust in the market, significantly lowers the risk of greenwashing and double counting and protects the integrity of sustainability programs.

Ultimately, feedstock traceability and sustainability safeguards ensure that SAF delivers on its environmental promise, protects against reputational and regulatory risk, and aligns with the broader decarbonisation strategies of the aviation industry. In this context, price is evaluated against trust, credibility, and assurance.



Figure 3: RSB Logo



Figure 4: ISCC Logo

# Jet Zero<sup>®</sup>

Bringing the regions to  
the runway with SAF

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