

# Spotlight on Hydrogen Projects in Australia

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**Pure Hydrogen, JJ's Waste and Recycling, H2X Global.**

**South-east Queensland.**

**2022 onwards.**

## **Garbage collection trucks powered by hydrogen**



Heavy vehicles are a source of noise and air pollution in our cities. Garbage collection vehicles add to that noise and pollution in residential areas as they move through neighbourhoods every week on their collections. Local governments across Australia spend significant amounts of money on procuring, maintaining, and refuelling their fleets. As an alternative to diesel, hydrogen-powered garbage collection vehicles are shaping up as serious replacements for their diesel counterparts.

Notably, hydrogen technology company Pure Hydrogen invested \$310,000 to partner with H2X Global and JJ's Waste and Recycling to provide a fleet of hydrogen-powered collection vehicles. Not only are these vehicles expected to run much more quietly and without emissions compared to their diesel counterparts, but Pure Hydrogen claims that these vehicles will be lower maintenance too, mainly attributable to having fewer moving parts.

The initial rollout of these trucks will be on the Gold Coast, but there have been many other conversations across Australia to convert fleets of collection vehicles to hydrogen. Competitor vehicle manufacturer Hyzon has partnered with Superior Pak to bring hydrogen-powered garbage trucks to the Queensland city of Bundaberg.

A final point of contention surrounds the source of the hydrogen to power these trucks: Pure Hydrogen is investigating whether methane from decomposing waste can be used to make hydrogen for the trucks. If this technology becomes viable, collection vehicles could be powered at least in part from the garbage that they collect.



Further reading:

- [Aussie First: Pure Hydrogen's green trucks could be taking your waste away](#)
- [Pure Hydrogen to Develop Australian First](#)
- [Cleanaway adds hydrogen to increase fleet sustainability](#)

**Hyzon Motors & RACV; IVECO.**

**Noble Park, Victoria.**

**2022 onwards.**

## **Locally-assembled hydrogen trucks**



Australia relies heavily on road freight. Trucks move goods all over the country, whether it's between cities, across town, or from planes, trains, and ships. Overwhelmingly, the trucks of today use diesel to power their engines. In areas frequented by trucks, air quality suffers from pollution, and residents along trucking routes are disrupted by the noise.

Trucks powered by hydrogen promise equivalent range and power to diesel counterparts. In addition, hydrogen-powered trucks are quiet and do not emit air pollution. Hydrogen vehicle manufacturer Hyzon has seen the potential for the technology and have chosen south-east Melbourne to build their Australian assembly plant in a partnership with the RACV. This forms part of Hyzon's \$50 million plan to expand operations in Australia.

In their new site, Hyzon will begin assembling hydrogen trucks. They hope to have trucks rolling out of their assembly plant in 2025, where they expect to produce over 100 engineering jobs and stimulate manufacturing and hydrogen-related expertise in the local area. Hyundai are preparing to send hydrogen-powered trucks to Australia from mid-2025.

Currently, hydrogen trucks must contend with a lack of publicly available refuelling stations. This is being addressed by governments along major trucking routes, such as the recent announcement along the Hume Highway (see below). Beyond these public refuellers, depots will be able to make their own hydrogen from on-site renewables if they desire.



Further reading:

- [Hyzon to Build Green Hydrogen Fuelling Depot in Victoria](#)
- [Hyzon Motors to establish Australian headquarters](#)
- [Hyzon Motors](#)

**Hycel; Warrnambool Bus Lines; Deakin University; Victorian Government.**

**Warrnambool, Victoria; Emerald, Queensland.**

**2021 onwards.**

## Hydrogen-powered buses and coaches



Some of the earliest demonstrations for hydrogen were buses. Since the first Australian pilot in Perth from 2004–2007, Australian transit agencies have been investigating hydrogen buses as part of their zero-emission fleet procurement strategies.

Hydrogen-powered buses share many of the benefits of electric buses including smoother acceleration, zero emissions, and quieter operation.

However, whereas too many fast-charging buses may cause excessive demand spikes on existing electricity grids, hydrogen buses can be refuelled quickly from hydrogen produced from on-site renewables or a constant power draw from the grid.

Hydrogen buses are being seriously considered by transit agencies across New South Wales as part of Transit for New South Wales' zero emissions strategy. In Victoria, bus operator Warrnambool Bus Lines is getting on board the local Hycel Technology Hub to deploy hydrogen buses across the coastal city as part of \$2.3 million allocated by Deakin University to research hydrogen at their Warrnambool campus.

For longer journeys, Queensland coach operator Emerald Coaches has chosen to invest \$100 million to replace its fleet of 120 diesel coaches to hydrogen by 2040, on the basis that they could ultimately produce all their hydrogen on-site and it would provide the best road map to zero emissions.



Further reading:

- [Emerald Coaches to Invest \\$100 million for Hydrogen-Powered Fleet Overhaul](#)
- [Deakin University's \\$2.3 Million Hydrogen Test Bed Gets Underway](#)
- [About Hycel](#)

**Toyota; CSIRO; Neoen; ActewAGL; ENGV; FCAI; Hyundai; SG Fleet; State, Territory, and Federal Governments.**

**Highway 1 between Melbourne, Canberra, Sydney, Brisbane.**

**From approx. 2025.**

## **Building a hydrogen refueller network for commercial vehicles**



Despite development of hydrogen vehicles over the past two decades, hydrogen mobility has experienced an ongoing shortage of refuellers — especially in public. Many early adopters of hydrogen vehicles have been able to manage the issue of refuelling by constructing their own facilities at depots. However, this arrangement will not satisfy the needs of vehicles that make long-distance journeys far from their depot.

In 2021, Australia's first *publicly accessible* refueller supplying green hydrogen was opened in Canberra, and state and territory governments recently struck a deal to make a route-based refueller network a reality. Under the terms of the memorandum of understanding, a network of renewable hydrogen refuellers will be built along the segments of Highway 1 linking Melbourne, Canberra, Sydney and Brisbane together: the Pacific, Newell, and Hume Highways. The Victorian and New South Wales governments are committing \$10 million each to refuellers in their sections of the agreement.

Unlike many of the previous demonstration projects, the refuellers being proposed along the highway are specifically intended for commercial vehicles. In the same way that chargers drew EVs to new parts of the country, so too could strategically located refuellers bring hydrogen-powered trucks into local economies. Commercially-available hydrogen trucks are likely to start appearing on our roads from the likes of Hyundai, Hyzon (see above), Iveco, Nikola, and others.



Further reading:

- [Hydrogen Highways to Link Australia's East Coast](#)
- [Hume Hydrogen Highway](#)
- [East Coast Renewable Hydrogen Refuelling Network Map](#)

**Australian and Japanese governments; Kawasaki Heavy Industries; J-Power; Iwatani, Marubeni, AGL, Sumitomo.**

**Hastings, Victoria.**

**2021 onwards.**

## **Turning Victoria's ports into hydrogen energy exporters**



With its renewable energy resources, Australia is positioning itself as a hydrogen exporter to countries around the world. Part of this process is discovering the best ways to store hydrogen for long-distance export by sea.

Ports across Victoria have been investigating how they can engage with the hydrogen economy, including the Port of Geelong, the Port of Hastings, and Port Anthony. These ports have recognised the value that hydrogen can bring to them and industries in the area — all of which are keen to be involved in the manufacture, transport, and export hydrogen.

Last summer, the specially-built *Suiso Frontier* docked at the Port of Hastings as part of the Hydrogen Energy Supply Chain project to receive a world-first demonstration cargo of 2.5 tonnes of liquefied hydrogen. This project has received \$500 million of investment.

Now that the *Suiso Frontier* has completed her journey to the Japanese city of Kobe, industry and government are working together to evaluate the success of the voyage. Regardless of how hydrogen may be shipped overseas, the export market for hydrogen stands to benefit ports and industries that supply equipment and hydrogen to them.



Further reading:

- [Hydrogen Energy Supply Chain](#)
- [Hydrogen Energy Supply Chain Pilot Project](#)

**Incitec Pivot, Fortescue Future Industries, Line Hydrogen, Climate Capital, CAC-H2, Clean Holdings.**

**Bell Bay, Tasmania; Brisbane; Bundaberg; Port Anthony, Victoria.**

**2022 onwards.**

## **Local clean hydrogen and ammonia production**



Projects across Australia are being progressed to manufacture clean hydrogen locally. Hydrogen represents a potential output for excess renewable capacity, or even upcycling industrial and agricultural waste products.

For instance, Tasmania's Bell Bay will play host to a \$100 million venture by Line Hydrogen and Climate Capital to produce 1,500 kilograms of green hydrogen daily from local renewables for fuel and transport applications.

Significantly, hydrogen can be used for a range of other purposes aside from transport. Ammonia is a vital chemical required for the downstream manufacture of a range of products, including many of agricultural significance. Manufacturing ammonia requires hydrogen as a feedstock, but the conventional process of producing that hydrogen uses unabated natural gas and is highly polluting.

The increased interest in clean hydrogen has, in turn, increased interest in the role it can play to decarbonise ammonia production. Feedstock applications of hydrogen, where it is used as a chemical precursor for other products, represent some of the most dramatic greenhouse gas reductions per quantity of clean hydrogen produced. Aside from ammonia production, clean hydrogen may also help clean other difficult-to-decarbonise processes, such as steel production and methanol synthesis.



A number of notable projects to produce carbon-neutral or even carbon-negative ammonia have begun. Green ammonia is also a candidate for exporting hydrogen overseas, where it can subsequently be used in chemical manufacture. In future, ammonia could also be reconverted back into nitrogen and hydrogen at the destination.

- Incitec Pivot and Fortescue Future Industries are investigating the requirements to convert Incitec's Brisbane ammonia plant to make green ammonia from electrolyzers making 50,000 tonnes of green hydrogen annually.
- In Bundaberg, a proposal has been pitched by CAC-H2 and Clean Holdings to gasify locally-sourced sugarcane waste to produce 30,000 tonnes of "carbon-negative" ammonia for export alongside leftover biochar. The companies are hoping to attract \$400 million for the investment.
- CAC-H2 are partnering with Port Anthony in Victoria to produce 75,000 tonnes carbon-negative ammonia from locally-sourced woodchips and up to 1,000 tonnes of hydrogen for export by 2023. Over \$20 million is expected to be spent on the project.

Further reading:

- [Line Hydrogen Unveils Tasmania Green Hydrogen Plant](#)
- [Brisbane Startup Aims to have Green Hydrogen Plant in Bell Bay Tasmania Producing by January](#)
- [Fortescue Plans Australia's First Major Green Ammonia Plant Near Brisbane](#)
- ['Carbon Negative' Hydrogen and Ammonia Hub Plan Partially Unveiled for Bundaberg](#)
- [International Partnership to Investigate Green Ammonia Supply from Australia's Hydrogen Hubs](#)
- [CAC-H2](#)
- [Port Anthony Renewables Signs JV for Green Energy Hub](#)