Hydrogenus Energy Limited

Products

September 2025

"Zero Carbon Electricity, On Demand at a lower cost"

The Hydrogenus Energy (HYE) modified Internal Combustion Engine (ICE) or "HYE-ICE", delivers :

- Zero CO2, Zero particulates, Zero NOx, Zero SOx;
- Emissions are only (pure) water
- Using low-pressure hydrogen, avoiding the need for exotic materials and compression;
- Using less than pure Hydrogen, giving a much lower fuel cost;
- As it is easy to operate, like a diesel making it ideal for remote locations;
- Responding very easily to changes to load, from 20% to 100% virtually instantaneously;
- Maintaining very tight control on output; always 1,500rpm +1%/-2%;
- Lower maintenance; zero carbon in the fuel means less wear and the oil has a longer life;
- Our modifications do not involve any moving parts;
- Operates very well at low load; NO bore glazing as no carbon in the fuel

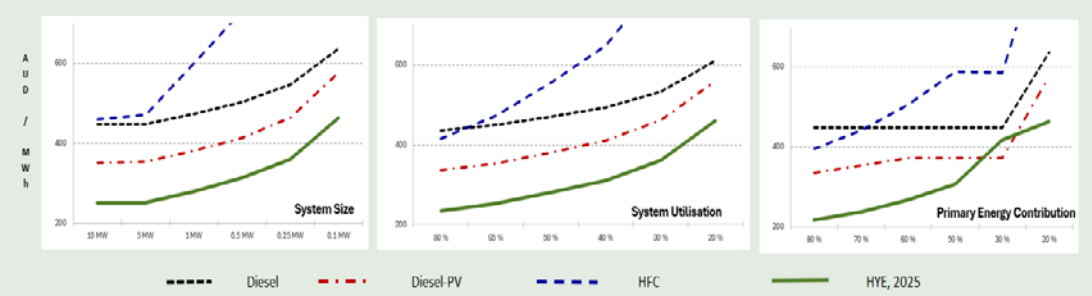
Our Competitive Advantages

- Lower operating cost;
- Fuel security, when HYE has finished developing its ammonia cracker, then use either hydrogen produced on site or ammonia imported, or both;
- Ease of maintenance;
- Price competitive;
- Long duration storage lower cost if need at least 3 hours.

Hydrogenus Energy ("HYE") has developed and patented the Intellectual Property of the modifications to be made for an Internal Combustion Engine ("ICE") to be able to operate safely, effectively and efficiently using Hydrogen, of almost any quality, injected at low pressure, as its fuel.

June 2025 - Off-grid, lowest cost electricity on demand

A brand of electrolyser has become available that is electrically efficient, requiring less than 35kWh/kg H, and cost effective at modest scale, at AUD 30k per kg H an hour. The following set of charts shows that a system which uses PVs and / or wind as the primary energy source, with excess energy being used to produce hydrogen stored on site is the lowest cost method of ensuring the supply of electricity on demand for off-grid areas.



October 2025 – Grid syncing and grid forming

The Hydrogenus Energy modified Internal Combustion Engine ("HYE-ICE") responds virtually instantaneously to changes in load, if it is operating at least at 20% loading.

HYE has partnered with D W Controls, an electrical contractor that is licensed to connect capacity, up to 5MW, to the Australian Grid. Together, we are able to offer grid firming and, more importantly, grid forming capacity at a lower cost than any other system, if energy is to be stored for more than 3 hours.

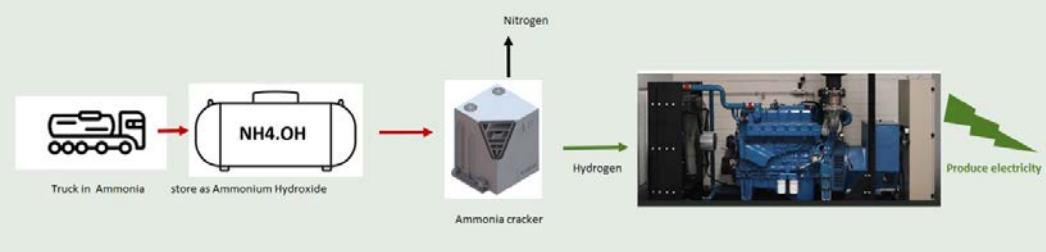
This system can be employed to use grid supplied electricity when prices are low and return the electricity to the grid at times of high prices, thereby helping to balance grid load.

March 2026 – Ammonia as the energy source; 500kW HYE-Forming Box

HYE is currently developing an ammonia cracker that will

- Use energy from the exhaust system of the HYE-ICE as its power source;
- Fit within the envelope of the engine; and
- Be much simpler and cheaper than commercially available ammonia crackers as it will not need the purification required for high purity hydrogen and will not need to be stored at high pressures.

The operation will be very similar to the current operation of diesel fuelled generators as illustrated in the diagram below.



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However, there will be much less maintenance.

Using ammonia as the energy source frees our grid forming application from the constraint of hydrogen produced and stored on site, as back-up energy can be assured by transporting ammonia to site. It can be stored at site cheaply in the form of ammonium hydroxide, which is almost immune form theft and will extinguish rather than fuel bush-fires.

This can be packaged, with 5 of the 100kW HYE-ICEs in a 40-foot container as a transportable power station.

The exhaust will be pure water, which can be used on site.

August 2026 - Low cost Green ammonia; 1MW HYE-Forming Box

HYE is presently planning / negotiating for the development of a 30kW HYE-ICE, responding to an indicated demand of more than 200 such engines each year, on an on-going basis. HYE expects this will be completed relatively soon, and then HYE will develop a 250kW HYE-ICE. This will enable to development of a 1MW Power station, in place of the 500kW power station, within the same 40 foot container

Further, HYE has been advised to expect that, by the middle of 2026, 2 complementary products will become commercially available :

- A product / technology to produce ammonia using variable renewable energy at a scale that is very modest compared with current plants, and capital and operating costs much less than current technology; and
- A new technology electrolyser that is very tolerant of water quality; ie. able to use brackish and / or polluted water.

Together, these technologies will facilitate local production of zero carbon ammonia at a cost that is lower other energy sources in most circumstances.

The HYE-Forming Box can then be operated to

- Provide immediate back-up electricity supply, for the grid, data centres or any other significant load requiring high quality electrical power;
- Perform gird forming, syncing to the grid and providing inertia to the grid to keep the current stable and avoid voltage surges and tripping;
- Assist in balancing load, as one application can be to draw power, when prices are low, to produce hydrogen to re-inject electricity when prices are high;
- Provide Long Duration Energy Storage, using our cracker to crack hydrogen from ammonia stored on site as ammonium hydroxide;
- Be environmentally friendly by using "Green" ammonia, as the only emissions are pure water, which can be used for other purposes, with no SOx or NOx (as our exhaust gas temperature remains too low for NOx to form) or particulates;
- Shift electrical energy in time, by storing as hydrogen and / or ammonia, and re-injecting when needed;
- Shift electrical energy in place, by storing as ammonia which can be trucked to a better suited location, if the generation site is constrained;
- Provide pure water, from the exhaust;
- Provide oxygen, which is valuable in certain applications;
- Utilise waste heat recovery, improving energy efficiency

December 2026 : Transportable Energy Self-sufficiency

HYE has an option to test a device that has been shown, at lab scale, to significantly reduce the amount of electrical energy required to produce 1kg of H, down to as little as 10 – 15kWh, by using other forms of energy, including heat, magnetics and sound waves.

This device promises the possibility of a box that requires no external energy inputs, except for some water.