

Driller cuts diesel use by 18% with clean energy

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The HYDI unit is compact and robust with a fully welded stainless steel case to enable deployment in harsh environments and does not store any hydrogen nor have any reliance on a pressure vessel.



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*HYDI managing director
John Wilson*

ADIA contractor-member Titeline Drilling has slashed its diesel fuel usage by 18 per cent while reducing its carbon footprint thanks to clean energy technology developed by an Australian company that produces hydrogen on demand for controlled delivery to internal combustion engines. Jamie Wade writes.

As pressure builds on companies to reduce their carbon footprint, an economically sustainable solution with full utilisation of existing diesel assets is now achievable with a technology that pays for itself.

Hydrogen, as alternative clean energy, has captured the attention of many and one Australian company is already rolling out technology that could be a gamechanger for many heavy industries including drilling.

HYDI – a start-up founded by John Wilson and Russell Williams – has been 12 years in the making and the company has been taking its HYDI carbon emissions reduction technology that pays for itself to market.

Essentially, HYDI produces hydrogen on demand for controlled delivery to internal combustion engines, primarily large diesel engines, to reduce fuel consumption and carbon emissions while increasing power and efficiency.

The technology delivers fuel savings, cleaner engines and, therefore, less maintenance and lower harmful emissions – especially particulate matter and improved machinery performance.

HYDI utilises electrolysis via a proton exchange membrane to produce hydrogen from distilled water. The system is powered by low electrical input drawn from the host engine while in operation. The hydrogen supplements the diesel fuel to create a cleaner and more complete combustion process with the amount of hydrogen produced optimised for the capacity and application of each engine.

A unique feature of the technology is a power and Electronic Control Unit (ECU) that controls the volume of hydrogen being introduced into the air intake system for all diesel internal combustion engines. This is critical to optimise engine performance, reduce carbon emissions and reduce diesel fuel consumption. The system is also chemical free, as it runs on demineralised water only.

Application of the technology in drilling has proved successful with Titeline Drilling, based in Ballarat, fitting a HYDI 1500 to a CAT 3406 mounted on a drilling rig operating in the Gawler Craton region in South Australia.

Since fitting the unit in April 2021, Titeline recorded reductions up to 18 per cent in fuel usage. The company is now equipping more of their drilling rigs with HYDI.



HYDI managing director, John Wilson, said Titeline was extremely happy with the trial results in fuel savings emissions reduction.

“We look forward to seeing this transfer over with more installs on our other units in our fleet,” Titeline Drilling CEO David D’Astoli said.

John said unlike HYDI, alternative solutions on the market run a unit on water and potassium hydroxide (acid) for conductivity.

“We initially worked with this solution until 2016 with the savings of fuel and emissions. However, acid is an internal cancer and it is extremely unreliable due to its aggressive corrosive nature which leads to component failures and product unreliability. KOH also



represents a health risk,” he told Australasian Drilling.

“HYDI’s technology harnesses the benefits of hydrogen in an efficient, affordable and sophisticated way scaled to apply to multiple applications. Unique features include: the use of demineralised water in very low quantities, the complete elimination of chemicals, low electrical current input, and electronic systems incorporating a controller and power module with extensive features and interface capabilities.”

The HYDI unit is compact and robust with a fully-welded stainless steel case to enable deployment in harsh environments and does not store any hydrogen nor have any reliance on a pressure vessel.

The unit can be retrofitted on the host engine and is not dependent on HYDI. It is applicable to large diesel engines and any industry that consumes large volumes of diesel fuel.

Markets for the technology include heavy transport with 96,000 articulated vehicles in Australia based on the 2016 Census, mining, heavy industry, static generators (remote area, agriculture, and hire), marine applications for propulsion and generators, buses and locomotives.

“Purchase is motivated by economic or environmental considerations, or both,” John said.

“The cost savings derived from reduced fuel usage and longer service intervals for a cleaner engine provide for a rapid return on investment. The unit is suitable to fit on existing assets and is transferable.

“The reduction in carbon emissions, from saved fuel, and from fuel consumed while using hydrogen, reduces the carbon footprint for a corporation and contributes to climate change mitigation initiatives.”

While hydrogen fuel supplementation is regarded as a transitional technology, added John, it is recognised that diesel will continue to power heavy equipment for decades to come.

“Making those assets cleaner to operate, preserves the asset valuation and facilitates its longevity,” he said.



“Independent testing with the University of South Australia has shown HYDI can achieve an 80 per cent reduction in carbon particulate matter emissions.”

HYDI is designed, manufactured, and warrantied in Australia. HYDI is exhibiting on booth one at ADIA’s DRILL 2022 conference and exhibition in Adelaide 17 to 19 May. ▲