JENBACHER J420 ENGINE HARNESSES THE PROMISE

of global renewable energy with hydrogen

»Global energy usage is expected to grow continuously, and policy makers around the globe are forcing the industry to increasingly rely on renewable energy. Based on green hydrogen production, the Hychico project harnesses the power and promise of a large future role for renewable energy. INNIO Jenbacher's fuel-flexible technology is a key enabler of the energy transition, producing flexible power and heat from green H_2 methane mixtures.«

Sergio Raballo, CEO Hychico

Needed: Large-scale intermittent renewable energy storage solutions

To combat climate change and limit the rise in global mean temperature to well below 2° C, an energy evolution of exceptional scope, depth, and speed is needed. And, while a transition to 100% renewable energy is possible — experts predict that two-thirds of all power in 2050 will come from renewables — new technologies must be in place to make that happen.

Because the sun does not always shine and the wind does not always blow, solutions are needed to harvest the energy produced and store it for later consumption. One promising solution is wind-to-hydrogen production.

Wind-to-hydrogen project shows promise

In 2008, Hychico constructed a wind park along with a green hydrogen production plant that uses water electrolysis. The pilot project in Argentinean Patagonia produces power from the 6.3 MW wind park with an average capacity factor of approximately 50%. Some of the renewable energy from wind is used to run an electrolyser plant producing 120 Nm3/hour of high purity hydrogen and 60 Nm^3/hour of oxygen.

The high purity hydrogen (99.998%) produced at Hychico's plant is being stored in an underground reservoir.

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Converting green hydrogen mix to power

To better assess the potential benefits associated with large-scale underground hydrogen gas storage, Hychico has participated in the European HyUnder consortium's efforts to provide comprehensive technical, economic, and societal evaluations of hydrogen storage. While the underground hydrogen storage is being researched, hydrogen is already being mixed with natural gas and used for INNIO Jenbacher's gas engine technology.

Hydrogen is mixed in a controlled way with natural gas fuel for one of INNIO's 1.4 MW Jenbacher gas engines, especially adapted for this application. Running on a mixture of natural gas from local gas production and up to 42% (by volume) hydrogen, the Jenbacher J420 gas engine delivers excellent performance and lower emissions. Only at very high hydrogen mixtures does the output of the engine need to be adjusted to maintain stable operation.

The flexibility to operate across a wide range of natural gas/hydrogen mixtures makes the J420 gas engine an ideal technology for converting the stored hydrogen back to power.

In operation at the Hychico site since 2008, the proven, economical, high-efficiency gas engine has clocked more than 70,000 operating hours.

Affordable and reliable power without carbon emissions

The Hychico facility is located 20 km outside of Comodoro Rivadavia City in the Chubut province of Patagonian Argentina. While the global installed capacity of wind power plants is currently about 600 GW, Patagonia has a potential for about 2,000 GW. The region's excellent wind conditions and low local electricity demand make it an ideal place for exporting hydrogen produced via wind energy to worldwide locations.

Indeed, green hydrogen could become a future global commodity, and INNIO's Jenbacher gas engines could be a key enabler and integral part of this energy transition. Running on natural gas/hydrogen mixtures, INNIO's gas engines around the globe could deliver reliable dispatchable and economical electricity with very low carbon emissions.



From wind power to hydrogen to storage to electricity, INNIO Jenbacher gas engines are leading the way to a greener future.

Key Technical Data

Engines installed	1 x J420
Electrical output	1.4 MW
Fuel	Natural gas with up to 42% (V) H_2
Commissioned	2008

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INNIO is a leading provider of renewable gas and hydrogen-rich solutions and services for power generation and compression at or near the point of use. With our Jenbacher and Waukesha products, INNIO helps to provide communities, industry and the public access to sustainable, reliable and economical power ranging from 200 kW to 10 MW. We also provide life-cycle support and digital solutions to the more than 54,000 delivered engines globally through our service network in more than 100 countries. We deliver innovative technology driven by sustainability, decentralization, and digitalization to help lead the way to a greener future.

Headquartered in Jenbach, Austria, the business also has primary operations in Welland, Ontario, Canada, and Waukesha, Wisconsin, U.S.

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