

Carbon Neutral Gas Storage Facility Benefits from Waukesha VHP Series Five Engines

The Katy Storage and Transportation (Katy) facility, owned by Enstor Gas, LLC (“Enstor”), became the first gas storage facility in the nation to become carbon neutral.

To reduce baseline emissions, Enstor swapped out their lean burn engines for rebuilt VHP Series Five engines from INNIO Waukesha. The remaining

emissions are offset using carbon credits purchased through the American Carbon Registry. This methodology meets the EPA’s standard for carbon neutrality and reduction of Scope 1 and Scope 2 emissions. Enstor is proud that these reductions will also benefit the Katy customers and reduce their Scope 3 emissions.

Multiple technologies were evaluated for emission reductions, but ultimately the VHP Series Five was chosen for its ability to reduce about 90% of Methane in the exhaust as compared to their lean burn engines, and reduce CO₂e intensity by about 20%. Traditionally a rich burn engine would have consumed more fuel than a lean burn engine, but Enstor took



advantage of the VHP Series Five Miller Cycle which keeps fuel consumption on par with a comparative lean burn engine.

The nine Waukesha VHP lean burn engines at Katy are being swung through INNIO Waukesha's "reUp" remanufacturing and upgrade program. Rebuilt VHP Series Five engines have the same footprint and will be placed into the same location as the existing engines. The reUp program reduces the environmental impact of manufacturing new engines, while enabling new engine technology and performance to benefit existing operations.

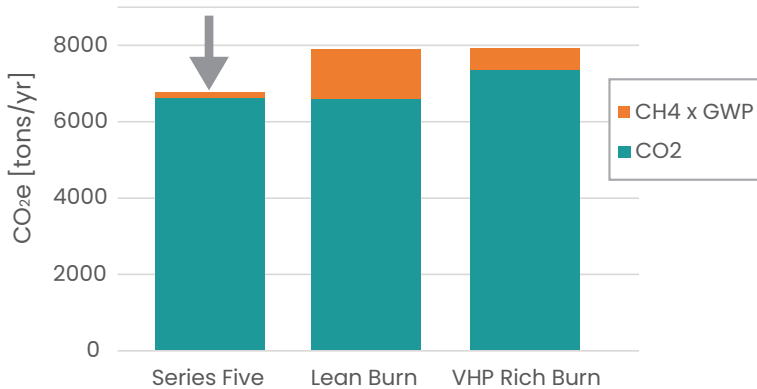
Reducing environmental impacts can be a costly endeavor, but Enstor is leading the way forward and showing that it can be

completed while remaining profitable. The reUp program allowed Katy to upgrade to the latest technologies while reusing their existing infrastructure, compressors, and most of the existing package. The VHP Series Five engine can reduce CO₂e output while also lowering operating expenses with longer service intervals. Enstor did not have to choose between profitability or lower emissions, they can achieve both simultaneously.

This project is funded in part by the State of Texas through a New Technology Implementation Grant Program from the Texas Commission on Environmental Quality.



Greenhouse Gas Comparison



Modified VHP Series Five piston design improves combustion, extends service intervals, and reduces hydrocarbon emissions.



Lower NO_x, CO, CO₂, and CH₄ emissions achieved simultaneously with VHP Series Five.

- CO₂e tons/yr data normalized to 1480hp, 8760 hours per year
- Global Warming Potential (GWP) of 25 is used

About INNIO

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. For more information, visit the company's website at www.innio.com. Follow INNIO on Twitter and LinkedIn.



Contact Waukesha:
www.innio.com/en/waukesha

IWK-422006-EN

*Indicates a trademark
© Copyright 2022 INNIO Waukesha Gas Engines Inc. Information provided is subject to change without notice. All values are design or typical values when measured under laboratory conditions.

