



Ember Resources Reduces CO2e with INNIO Waukesha VHP Upgrades

Upgrades funded through Alberta's emissions reduction programs and supported by Waukesha

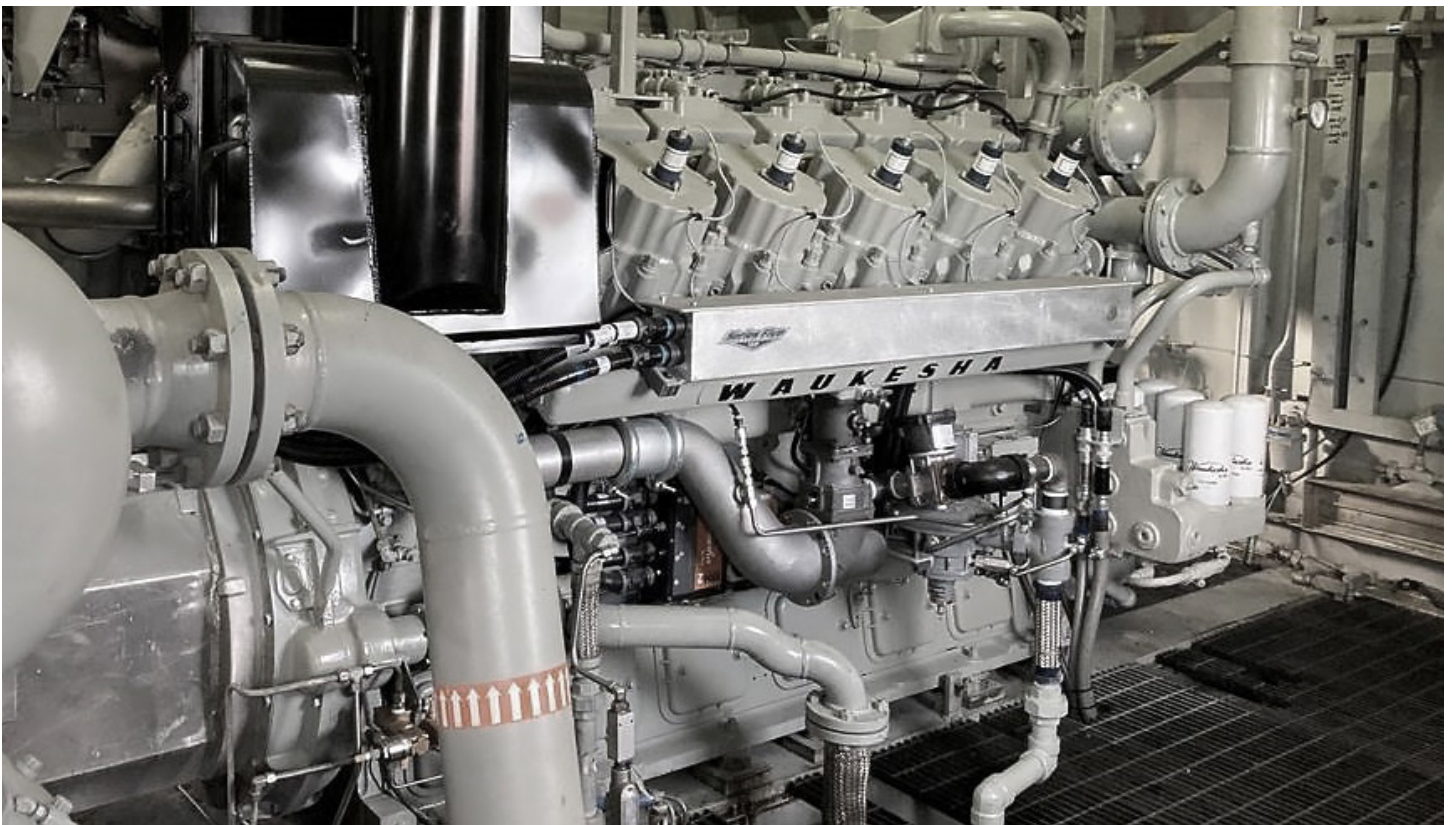
Background

Today, natural gas producers are tasked with a long list of challenges facing the energy industry. Emissions regulations, fluctuating commodity prices, shortages in trained workers, and challenging operating conditions are just a few of the issues companies face when beginning a project. For Ember Resources, each project provides an opportunity to increase the bottom line for their investors. However, each project must be carefully considered through a set of specific criteria before it is approved.

Through recent Canadian grant programs providing incentives for station emissions reductions, Ember and INNIO Waukesha Gas Engines partnered on a project that's had many lasting operational and environmental benefits – and will continue to provide them for years to come.

As the largest coalbed methane (CBM) producer in Alberta, Ember Resources continues to grow its Western Canada footprint. Ember's activity centers around the Horseshoe Canyon region, which holds nearly 180M cubic feet of untapped CBM.

Ember's plans to expand in this region include being good neighbors to the communities impacted by these critical natural resources' extraction. Project design must account for low emissions, noise attenuation, high air quality, and stringent safety recommendations to pass approval. With the clock ticking for project approval and government funding, Ember and Waukesha teamed up to upgrade ten 7044 Series Two GL and GSIs to Series Four and Five specifications. Ember called in Waukesha's team of experts



to provide engineering and technical support. Ember's Emissions Compliance and Rotating Equipment Specialist, Jay Befus, explains, "Waukesha's assistance with Government program navigation combined with their technical engineering support provided was nothing less than exceptional. Ember relied on Waukesha to help lay out technical details required throughout Government program application as well as equipment retrofit processes. A challenge that Waukesha's team knocked out of the park." By Waukesha's conservative estimations, the emissions reductions were significant enough to warrant a fast-track approach:

10M tonnes CO2e reduction, plus 20-25% service interval extensions and savings on fuel and oil consumption. Ember installed the first Series Four and Five upgrades in Q4 2020 and immediately recognized a difference. "In addition to significant stack emissions reductions the Waukesha VHP engine conversions have proven a decrease in fuel consumption and increased reliability. This has contributed to a realized reduction to both operating and maintenance expenses. The addition of Series Four and Series Five engines to Ember's fleet have not only had a positive impact to the environment, but to our business as well."

"To be able to lower emissions and have Waukesha's guidance to navigate Alberta's programs was top-notch support. The operational benefits make the upgrades an all-around win."

Jay Befus
Emissions Compliance &
Rotating Equipment Specialist

Specifications

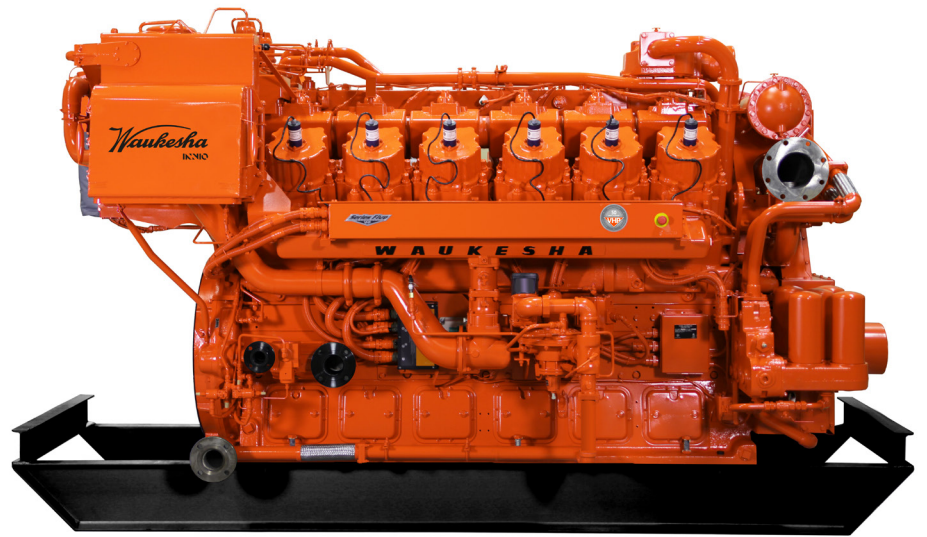
Engine	VHP 7044GSI S5
Power bhp (kWb)	1125 - 1500 hp (839 - 1119 kWb)
Piston displacement	7040 cu. in. (115.4 L)
Compression ratio	9.7:1
Bore & stroke	9.375" x 8.5" (238 x 216)
Jacket water system capacity	100 gal. (379 L)
Lube oil capacity	190 gal. (719 L)

Dimensions l x w x h inch (mm)

147 (3,734) x 85 (2,159) x 97.83 (2,485)

Weights lb (kg)

24,250 (11,000)



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.



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