CASE STUDY

DUAL FUEL TECHNOLOGY

H&P USES DUAL-FUEL TECHNOLOGY TO BOOST EFFICIENCY AND LOWER COSTS

Cat® Dynamic Gas Blending Gen 2 Kit provides H&P with valuable and flexible fuel advantages

For more than a century, H&P has streamlined its drilling technologies and processes to deliver better outcomes for onshore operators in the Lower 48. It strives to be a force multiplier of advanced drilling technologies that drive greater efficiency as the oil and gas industry evolves and operators work to reduce greenhouse gas (GHG) emissions.

Reshaping Onshore Site Efficiency

To futureproof its rig engines with lower-emissions technology, H&P engaged Caterpillar Oil & Gas to perform a major overhaul across its fleet. The company upgraded selected rigs with the Cat® Dynamic Gas Blending™ (DGB) Gen 2 Kit to capitalize on the latest generation of performance features while extending the longevity of driller's existing Cat 3512C engines. The DGB Gen 2 upgrade offers important fuel flexibility, delivering a high diesel displacement rate. This enables H&P to operate rigs with field gas or even compressed natural gas (CNG) to minimize diesel use, resulting in lower operating costs.

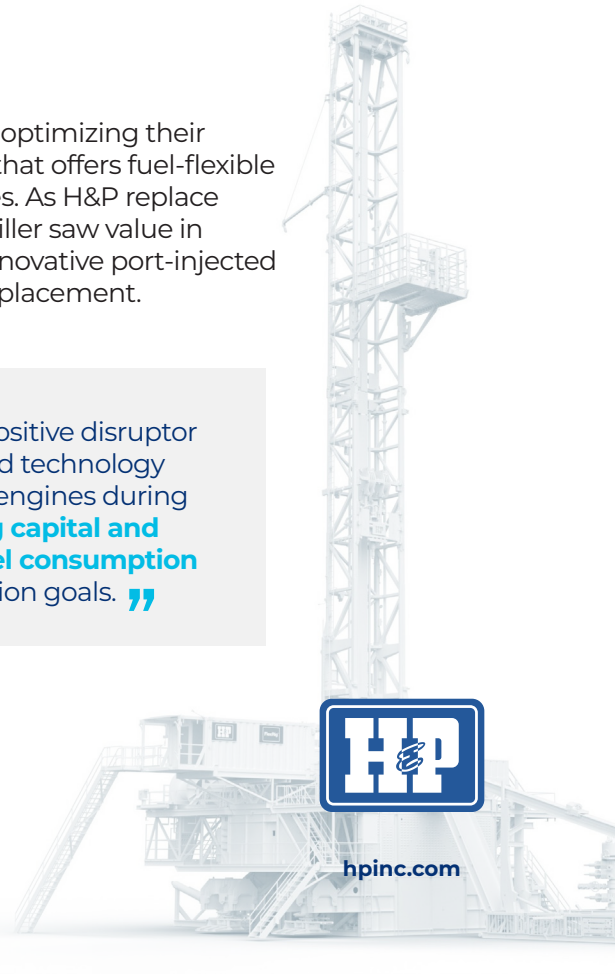
Balancing rising diesel costs with reduced consumption – and utilizing natural gas as an alternative fuel source – the Cat DGB Gen 2 Kit has been a valuable technology for H&P, improving performance with innovative port-injected technology to transform efficiency on site.

Maximizing Rig Engine Overhaul

As drillers enter the engine overhaul cycle, they can benefit from optimizing their current fleet with a cost-effective and efficient upgrade solution that offers fuel-flexible advantages – without the added costs of investing in new engines. As H&P replace a significant portion of its modern fleet with DGB engines, the driller saw value in upgrading to the latest DGB Gen 2 kits to leverage Caterpillar's innovative port-injected technology for improved thermal efficiency and higher diesel displacement.

> "Adding the DGB Gen 2 kits solution was a positive disruptor for our drilling operations. The streamlined technology has enabled us to upgrade our existing rig engines during overhaul, **saving us millions** by **reducing capital and operational costs** while also **lowering diesel consumption** to support our GHG emissions reduction goals."

Sonny Auld
Product Manager, H&P



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Driving Efficiency in Harsh Operating Conditions

H&P evaluated the impact of DGB Gen 2 upgraded engines on cost and efficiency, and noted that the dual-fuel capabilities helped reduce fuel consumption while increasing rig uptime. The driller observed that operating rigs with a diesel and natural gas combination positively impacted fuel efficiency while port injection capabilities enable real-time performance optimization. With precise air/gas ratio control at the individual cylinder level, H&P experienced faster response times and reduced unburned gas.

Field trials in the Eagle Ford demonstrated the kit's efficiency, displacing an average of 65% diesel over nine months. At peak performance, displacement reached 75%, saving over 94,000 gallons of diesel on a single rig with more than 4,500 engine hours. The driller then leveraged Cat Smart Engine Management System (EMS) data to further enhance efficiency by reducing engine runtime to conserve fuel and limit engine wear, as well as lower diesel consumption. Collectively, these positive outcomes helped H&P decrease the number of days on-site and the cost per well.

> "By reducing fuel consumption and costs and lowering overall emissions with diesel displacement, the DGB Gen 2 dual-fuel technology **enables us to deliver operational excellence in both drilling performance and productivity**, effectively bringing well expenses down."

JT Brady
Senior Manager, FlexRig Support Department, H&P

Powering Rigs in a Dynamic Environment

This next-generation dual-fuel system is part of H&P's broader strategy to enhance its fleet's capabilities, reduce operational costs, and lead the industry in sustainable drilling practices. By enhancing its existing assets with this advanced technology, H&P continues to set the standard for performance, efficiency, and sustainability in the drilling sector.

> "The DGB Gen 2 kit solution enables us to substitute pipeline or wellhead, CNG or LNG gas, which not only **lowers our diesel consumption** but also lets our motor hands work on **higher value tasks**. The Cat Smart EMS also **improves our ooperational efficiency** by automatically stopping and starting our enginees as needed."

Todd Fox
Director of Product Management, H&P

Plans are underway to integrate the DGB Gen 2 Kit into more than 60 engines in the FlexRig® fleet by the end of 2025, positioning H&P to remain at the forefront of technological advancement while maintaining the highest operational standards.

CONTACT US

For more information on how H&P can help you achieve better drilling outcomes, contact an H&P sales representative today or contact us through our website at **hpinc.com/contact.**

It's time to follow through on your drilling performance potential.