



DOE QER Primus' STG+ Flared Gas Solutions Eliminating flared gas by converting it into valuable product

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The North Dakota Gas Infrastructure Challenge



- Bakken wells produce natural gas that is currently flared because there is no infrastructure scaled appropriately to gather the current and expected volume.
- No currently available small scale modular systems can economically handle the natural gas
- There is a need for a technology jump that can convert methane at the well head into a product that eliminates the flare, leverages existing infrastructure, and is profitable.
- Primus Green Energy is a US technology development company that has built and is operating a flared gas conversion unit in NJ. With 50 employees and over \$60mm in financing, Primus is developing projects from 250-2000 BPD in locations throughout the US and the world

Primus Flared Gas Solution Illustration





The Primus process





Syngas generation is a commercially proven process with a wide number of off-theshelf solutions available

Key highlights

- Typically represents ~60% of capital costs for commercialscale plant
- STG+ is Primus' proprietary system
- Typically represents ~40% of capital costs for commercial-scale plants
- Key IP: Liquid fuels synthesis, fuel composition, control of gasoline composition
- Reactors and catalysts used are proven and commercially available
- Yield product optionality (gasoline, jet fuel, diesel, high value chemicals)

Primus process successfully demonstrated at 6.5 bpd; plant in operation w/ outstanding independent engineer's report on performance



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Demonstration plant





Primus Flared Gas Solution 3D Model











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Primus solution is ready for market conditions in remote locations while being economically attractive



- Cost-effective STG+ can produce over 5 gallons of product from each mmBTU of natural gas.
- Modular Our flaring gas GTL units will have a series of modules that are fully fabricated and tested in the factory and then transported to the site. At the site, the modules are placed on a pad, bolted together and connected to local inputs and outputs. The assembly can be readily disassembled, moved to another location and re-assembled there.
- Scalable Primus is providing modules for 500 bpd or 2000 bpd or higher.
- Remotely monitored Primus' STG+ has the state of the art Honeywell control system which has been successfully tested for thousands of hours at its demonstration plant at its New Jersey headquarters and it is working with its partners to integrate their control systems.
- Ultralow maintenance Advances in the STG+ process and partner processes are expected to require only yearly maintenance for minimal down time.
- Interfaces with existing infrastructure by producing a product that is miscible in crude, Primus can take advantage of existing infrastructure to move its product, or if a finished gasoline is required, it can be stored on site.
- Flexible products Primus can use a simplified process to produce a general liquid hydrocarbon product from the flared gas that can be added into the crude for transport from the wellhead or a low sulfur, 90+ octane gasoline. Primus customers have the flexibility to choose the product mix that best fits their needs.

What the Primus Flared Gas Solution does for you...



How can the Primus Flared Gas Solution help ND and the United States?

- Comply with state and/or local regulations
- Be good corporate citizen
- Monetize flared gas for NG owners who are losing royalties
- Eliminate the health effects of flaring on local residents
- Achieve higher production
- Produce crude oil where there is associated gas

The Primus Flared gas solution can...

- Eliminate flares while producing valuable product
- Permit additional production drilling where regulators require flare reduction or elimination
- Permit the production of stranded assets or those that have high production of natural gas relative to crude
- Produce product that can mixed with heavy crude for easier transport and processing
- Be a fully independent unit for remote locations





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