

Breaking Energy

INNOVATION, OIL & GAS, TECHNOLOGY

GE Teams up with Statoil to Make Energy Development Cheaper and Cleaner

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Sand conveyer-frac operation on the Wessendorff 6-Wessendorff 1 D pad near Kenedy, Texas, on Thursday, January 30, 2014. (Tom Payne, AP/Statoil)

General Electric (GE) and Norway's Statoil have announced a strategic collaboration to advance more environmentally friendly and economically sustainable technologies for oil and gas production. GE and partially state-owned Statoil have a long history of working together and both share a commitment to improving their environmental footprints, which is a goal increasingly valued by investors and shareholders.

The program is focused on technology innovation that will allow the entire industry to reduce emissions and local community impacts, while improving productivity and strengthening the social license to operate. A group of critical technologies are being developed in response to industry challenges that include gas flaring, CO₂ and methane emissions, truck traffic, and water usage.

Truck Traffic

One element of the program is an Open Innovation Challenge where the public is invited to present ideas to help reduce truck traffic associated with the transport of sand used for hydraulically fracturing oil and gas wells. Participants in the Challenge can earn prizes from a \$500,000 fund dedicated to the presentation of ideas that can lead to reduced sand use in advanced well completions.



credit: Statoil

Eric Gebhardt, CTO of GE says, “Open innovation is about being humble enough to ask the question externally and then looking at all the answers that come back to see what the best answers are, refining them and collaborating to come up with the best solutions. Pulling technologies together that may already exist in other areas and using them in novel configurations is a key form of innovation.”

Local communities near oil and gas fields have long identified truck traffic as a major concern and disruption, it is also one of the biggest costs and logistical challenges drillers face. Transportation of sand is the biggest source of truck traffic, followed by the transport of water. But water can be moved through pipes and the use of temporary water lines is a common practice that saves

money in addition to reducing heavy truck requirements. There is no alternative to moving sand by truck, and depending on the site, the number of sand trucks per well can range from 125 up to 275. So the challenge is to try and find ways to reduce the amount of sand needed on each well.

See a [Breaking Energy](#) slideshow depicting the natural gas development process – including hydraulic fracturing – [here](#).

CO₂ Fracking

An experimental oil well in the Bakken field in North Dakota will be fractured this year using liquefied CO₂ in combination with water. This cutting-edge technique has only had limited application in the field before now. Modeling suggests that there could be advantages to using CO₂ because it should create cleaner and more complex fractures than water does and allow for more efficient hydrocarbon flow. This should not be confused with using CO₂ for enhanced oil recovery, though the fact that CO₂ reacts with oil to make it more miscible and flow better does factor into both techniques.



credit: Statoil

It is thought that aside from making better fractures, CO₂ will flow out of the well more readily than water, making it easier to collect and reuse. The challenge in using CO₂ is that it does not carry the sand and other proppants needed to hold the fractures open and so some water is still required for that component of the process. The experiments are focused on improving the techniques to see if this pathway is viable and desirable, both economically and environmentally. Using CO₂ could also be beneficial in areas where access to water is constrained.

CNG-in-a-Box and Last Mile Fueling

GE and Statoil have already seen success in their use of field gas to operate drilling rigs and pressure pumps. There has been a great deal of pressure from regulators, environmentalists and lease holders to reduce excessive gas flaring in North Dakota and other locations. The Bakken oil field is very remote and expansive, making the construction of gas pipelines prohibitively expensive in some areas and this has led to a lot of natural gas being flared from oil wells.

GE has developed technology that is now being deployed to capture and clean up the gas on site and load it onto trailers as Compressed Natural Gas (CNG). The CNG can then be used to replace diesel fuel for drilling operations. This CNG-in-a-Box technology is being greeted as a real winner that both saves significant costs for drillers since the CNG is half the cost of diesel even at today's lower prices, and is also good for the environment because CNG is much cleaner than diesel. Statoil has plans to expand the use of natural gas fueling everywhere they can, from their trucks to their drill rigs, pressure pumps, generators and elsewhere.

Improved Technology

Other areas GE and Statoil are collaborating include improving gas compressor optimization. Gas compressors are used throughout the gas industry both onshore and offshore for numerous applications, like moving hydrocarbons through pipelines. GE is a major manufacturer of compressors and Statoil is a large buyer, by working together they seek to increase the performance and extend maintenance intervals by optimizing components. Performance targets include lowering NO_x and CO₂ emissions while improving cost per operating hour and reliability.

Gas turbines are getting an overhaul through the use online water wash technology that allows turbines to be cleaned of dust and contamination without taking them offline, which will reduce downtime and improve performance.

Both GE and Statoil are committed to continuous innovation that enables cost cutting, productivity improvement and greater environmental sustainability.

Topics: CO₂ Fracking, Drilling, Emissions, Fracking, GE, General Electric, GHG Emissions, GHG Emissions Mitigation, Hydraulic Fracturing, Natural Gas, Oil, Oil and Gas Development, Proppant, Statoil, Water Use, Well Completion Technology
