

USA: Decarbonization Strategy

## **World's Largest Post-Combustion Carbon Capture Facility On-Schedule**

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NRG Energy and JX Nippon Oil & Gas Exploration Corporation (JX Nippon) have completed construction, on-budget and on-schedule, of Petra Nova, the world's largest post-combustion carbon capture system.

Houston/USA — Petra Nova first captured carbon dioxide (CO<sub>2</sub>) on September 19, 2016 and has delivered more than 100,000 tons of captured CO<sub>2</sub> to the West Ranch field through an 80-mile pipeline. Final performance acceptance testing on the facility was completed on December 29, 2016 and the facility turned over for operations. During performance testing, the system met all performance criteria including capturing more than 90% of CO<sub>2</sub> from a 240MW equivalent slipstream of flue gas off an existing coal-fueled electrical generating unit at the WA Parish power plant in Fort Bend County, southwest of Houston. At this level of operation, Petra Nova can capture more than 5,000 tons of CO<sub>2</sub> per day which is the equivalent of taking more than 350,000 cars off the road. Construction on the Petra Nova project began in 2014 with a goal to be operational by the end of 2016.

Hilcorp Energy Company (Hilcorp), the operator of West Ranch oilfield, will use the captured CO<sub>2</sub> to boost production at West Ranch oilfield, jointly owned by NRG, JX Nippon and Hilcorp. Both Hilcorp and the University Of Texas Bureau Of Economic Geology will monitor the movement of CO<sub>2</sub> deep in the oil reservoir. Over the next few years, oil production at the field is currently estimated to increase from approximately 300 barrels per day before beginning Enhanced Oil Recovery (EOR) operations to production of up to 15,000 barrels per day using captured CO<sub>2</sub>.

"To date we have drilled nearly 100 new wells in the West Ranch field and have implemented a robust CO<sub>2</sub> and ground water monitoring program," said Jeffery D. Hildebrand, Chairman and CEO of Hilcorp Energy Company. "We are excited about this project, and expect to see a meaningful increase in oil production at West Ranch in the near future."

Petra Nova is 50-50 joint venture by NRG and JX Nippon. Additionally, the United States Department of Energy (DOE) is providing up to \$190 million in grants as part of the Clean Coal Power Initiative Program (CCPI), a cost-shared collaboration between the federal government and private industry. A portion of the project was financed with project loans from the Japan Bank for International Cooperation (JBIC) and Mizuho Bank, backed by Nippon Export and Investment Insurance (NEXI).

Petra Nova uses the KM-CDR Process, jointly developed by Mitsubishi Heavy Industries, Ltd. (MHI) and the Kansai Electric Power Co., Inc., and employs a proprietary KS-1 high-performance solvent for the CO<sub>2</sub> absorption and desorption. The carbon capture facility was constructed under a fixed-price contract by a consortium of Mitsubishi Heavy Industries Americas, Inc. (MHIA) and TIC (The Industrial Company). At peak construction, over 500 people were working on the project.

NRG, JX Nippon and Hilcorp expect to host a ribbon cutting at the site in the first half of 2017.

Sixteen-foot diameter ductwork takes flue gas from the coal plant to the carbon capture facility where the CO<sub>2</sub> is removed from the flue gas by the amine solution in the tall absorption tower and then separated from the amine as 99.9% pure CO<sub>2</sub> in the smaller regenerator tower to the right before being compressed and delivered to the oil field.

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