University Gets $19 Million to Monitor Carbon Storage Project

EurekAlert

The University of Texas at Austin will receive up to $19 million from the U.S. Department of Energy and NRG Energy to design and oversee a monitoring plan for a carbon capture and storage demonstration project in southeast Texas.

The project will demonstrate advanced technology to reduce emissions of the greenhouse gas carbon dioxide (CO_2) from a coal-fired power plant.

This project will be among the first in the state of Texas, and one of only a handful in the world, to use anthropogenic CO_2 as opposed to naturally occurring CO_2 for enhanced oil recovery (EOR). EOR is a technique that involves injecting CO_2 into declining oil fields to increase oil yield. The objective of this project will be to ensure the long-term geologic storage of the injected CO_2.

"It's exciting because for the first time in Texas, we'll be storing CO_2 captured from industrial processes that would otherwise have gone into the atmosphere," said Rebecca Smyth, principal investigator at the Jackson School of Geosciences' Bureau of Economic Geology.

The Department of Energy has selected NRG Energy, one of the nation's largest electric power providers, to receive up to $167 million of funding (some of which will be from the American Recovery and Reinvestment Act) to build a post-combustion CO_2 capture demonstration unit at the company's WA Parish power plant southwest of Houston. NRG will invest an additional $167 million in the project. A portion of the CO_2 from WA Parish's emissions will be scrubbed, transported to a nearby oil field and injected deep underground for EOR and long-term storage.

The Bureau of Economic Geology's Gulf Coast Carbon Center will subcontract with NRG to monitor the CO_2 during and after injection.

"Our goal is to demonstrate that the injected CO_2 stays where they put it," said Smyth.

"This project, which involves storage of CO_2 via enhanced oil recovery, is another important step toward commercial deployment of large-scale sequestration," said Scott Tinker, director of the Bureau of Economic Geology.

The proposed project was submitted under Round 3 of the Clean Coal Power Initiative Program (CCPI), a cost-shared collaboration between the federal government and private industry to demonstrate low-emission carbon capture and storage (CCS) technologies in advanced coal-based power generation. The goal of CCPI is to accelerate the readiness of advanced coal technologies for commercial

deployment, ensuring that the U.S. has clean, reliable, and affordable electricity and power.

The project is designed to show that post-combustion CCS applied to existing plants can be done economically, especially when the plant has the opportunity to sequester carbon dioxide in nearby oilfields.

Scheduled to begin operating in 2014, NRG's CCS demonstration project at WA Parish will use a class of chemicals known as amines to strip CO_2 from flue gas equal in quantity to that of a 60- megawatt power plant. It will be designed to capture more than 90 percent of incoming CO_2, or about 400,000 tons of CO_2 annually-a level that can further advance the technology's viability on a larger scale.

Gary Rochelle, professor of chemical engineering and head of the university's Luminant Carbon Management Program (LCMP), developed piperazine, one of the amines that will be tested in the new facility as a CO_2 stripping agent. The LCMP will subcontract with NRG for up to $650,000 for the carbon capture portion of the project.

The Bureau of Economic Geology, through its Gulf Coast Carbon Center, has a wealth of technical experience from years of conducting CO_2 storage experiments. The bureau has received more funding for CO_2 storage research than any academic unit in the country. This includes an ongoing $34 million, multi-year field study of CO_2 storage and monitoring strategies in southwest Mississippi. The bureau will also receive approximately $1 million to monitor a carbon storage project by Denbury Onshore LLC that will take CO_2 captured from a methanol plant in Lake Charles, Louisiana and a plant that produces hydrogen from methane in Port Arthur, Texas, ship it by pipeline to the West Hastings oilfield south of Houston, Texas, and inject it underground for EOR.

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