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CCS Alliance Update — September 20, 2011

1. DOE Awards $14 Million to IGCC Plants; Makes EOR Recommendations

- The U.S. Department of Energy ("DOE") awarded $14 million for six integrated gasification combined cycle ("IGCC") advanced coal projects. The projects will focus on lowering the costs of capturing CO_2 from coal-fired IGCC power plants. Recipients of the funding include General Electric Co., the Electric Power Research Institute ("EPRI"), TDA Research, Air Products and Chemicals Inc. and Reaction Engineering International. EPRI will use the funding to develop a preliminary design and cost estimate of whether the use of liquid CO_2 and coal slurry lowers the cost of running IGCC plants.

- DOE, in conjunction with the University of Kansas Center for Research, completed work on a recent study of enhanced oil recovery ("EOR") that confirms the feasibility of using EOR for drilling operations in Kansas oil fields. The study examined the use of near-miscible CO_2 flooding in order to extend the life of mature oil fields in the Arbuckle formation while simultaneously providing permanent geologic storage. Miscibility refers the pressure at which CO_2 and oil are completely soluble. Injected CO_2 that is lower than the minimum miscibility pressure mixes with and swells the oil to reduce viscosity and make it easier to recover. Researchers subjected core samples from the Arbuckle formation to simulate the CO_2 flooding. The studies showed that more than 50 percent of the residual oil remaining after water-flooding could be recovered from the formation, as well as the Berea Sandstone and Baker formations. The Arbuckle formation has produced 36 percent of the 6.1 billion barrels of oil produced in Kansas over the past 100 years.

2. Wyoming CCS Project Completes Drilling

- The Wyoming Carbon Underground Storage Project, a joint project between the University of Wyoming Carbon Management Institute and Baker Hughes, has finished drilling and collecting data from a 12,810-foot-deep test well. The well was designed to help researchers evaluate potential CO_2 storage in Wyoming's Rock Springs Uplift. The $16.9 million dollar project is co-sponsored by DOE and began in 2009. Data collected from the project will be used to produce a detailed characterization of two saline aquifers in the uplift for potential pilot- and commercial-scale CO_2 storage. Preliminary data suggests that the formations could store up to 26 billion tons of CO_2 over 50 years.

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3. Ethanol CO_2 Storage Project Could Hold Lessons for Coal

- Archer Daniels Midland is preparing to ramp up construction on a commercial-scale carbon capture and storage ("CCS") retrofit to an existing ethanol production facility. The project is backed by DOE, which awarded the project $141 million, and will inject the captured CO_2 into deep saline aquifers in the Illinois Basin. While the facility is an ethanol plant, knowledge gathered from the large-scale project could provide valuable data and models for coal-fired power plants across the region. If CCS is widely adopted, much of the U.S.'s captured CO_2 emissions will potentially be stored in the Illinois Basin. The first stage of the project will begin in Fall 2011, when researchers from the Illinois State Geological Survey will begin injecting 1,000 metric tons of captured CO_2 from the facility daily. Construction of a larger CCS system at the plant will happen concurrently, bringing the total amount of CO_2 captured to 3,000 metric tons daily.

4. Study Finds Risk of Death from CO_2 Leakage Remote

- A study by the University of Edinburgh School of GeoSciences has concluded that the risk of death from CO_2 leaking from underground storage sites is less than the risk of being struck by lightning or death from a car accident. The study, published in the Proceedings of the National Academy of Sciences, focused on naturally-occurring CO_2 seeping through the ground in Italy, but the authors say their analysis holds broad implications for industrially injected CO_2. According to Dr. Jennifer Roberts, who conducted the study, "[t]he fact that leakages occur every year in Italy with little harm means that closely monitored underground plumes of the greenhouse gas from large-scale capture should not create much of a health risk." The study was funded by the Scottish CCS Consortium, which has raised questions about conflicts of interest, despite it being published in a peer-reviewed journal.

5. University of Victoria Tests Fiber Optic CO_2 Monitoring

- The University of Victoria, in partnership with Carbon Management Canada, is conducting a project to test the feasibility of monitoring underground CO_2 via fiber optic technology. The three-year project will begin in the lab, then shift to field testing of new sensor systems, first in shallow ground and then in deeper environments. The goal of the tests is to develop a system to monitor CO_2 injection sites in deep underground formations. The project is supported by a $983,000 grant from Carbon Management Canada under the organization's Round 2 of its funding competition, which has previously awarded over $10 million to 18 projects throughout Canada.

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6. CO_2 Storage Project to Begin in Iceland

- Icelandic and American researchers are preparing to begin a collaborative project to study the potential to store CO_2 next to a dormant volcano in Iceland. The project, known as "CarbFix," will involve pumping carbonated water into a basalt formation near the volcano. The basalt is expected to react with the CO_2 to form limestone, permanently storing the CO_2. The test is sponsored by Reykjavik's city utility and members of the European Union, as well as American and Icelandic universities. It will be located at Reykjavik Energy's geothermal power plant, which runs on steam loaded with CO_2 and hydrogen sulfide. The CO_2 will be filtered out of the plant's emission stream and pumped to the injection well, where it will be mixed with water to be injected.