



Coal News and Trends

October 2009

Upcoming Industry Events:

- **ASTM International Training Course on Coal Chemistry, Atlanta, GA, October 21-22, 2009**

The implementation of new regulations for power plant emissions will increase the demand for testing of fossil fuels and plant emissions. Until now, comprehensive training on the coal characterization standards that are used every day around the world was not available outside of the laboratories that use these standards. Now ASTM is offering the opportunity to receive a comprehensive review of good laboratory practices in coal chemistry focusing on the standards most frequently used in coal chemistry labs. Laboratory technicians and chemists, professionals new to testing, and anyone working in fossil fuel testing laboratories will benefit from this course. A B.S. Chemist degree or a Chemical Technician degree or equivalent with 3-5 years experience is recommended. For additional information and to register for the training course, please refer to: <http://www.astm.org/TRAIN/filtrexx40.cgi?P+ID+54+/usr6/htdocs/astm.org/TRAIN/traindetail.frm>.

Policy Analysis:

Secretary Chu Announces First Awards from \$1.4 Billion for Industrial Carbon Capture and Storage Projects

http://fossil.energy.gov/news/techlines/2009/09072-DOE_Announces_Industrial_CCS.html

Washington, D.C. – U.S. Energy Secretary Steven Chu recently announced the first round of funding from \$1.4 billion from the American Recovery and Reinvestment Act for the selection of 12 projects that will capture carbon dioxide from industrial sources for storage or beneficial use. The first phase of these projects will include \$21.6 million in Recovery Act funding and \$22.5 million in private funding for a total initial investment of \$44.1 million. The remaining Recovery Act funding will be awarded to the most promising projects during a competitive phase two selection process.

"This is a major step forward in the fight to reduce carbon dioxide emissions from industrial plants. These new technologies will not only help fight climate change, they will create jobs now and help position the United States to lead the world in carbon dioxide capture technologies, which will only increase in demand in the years ahead," said Secretary Chu.

The successful development of advanced technologies and innovative concepts that reduce emissions of carbon dioxide into the atmosphere is a key objective of the Obama Administration's effort to help mitigate the effects of climate change. Carbon dioxide is a major greenhouse gas and contributor to global climate change.

Projects announced today include large-scale industrial carbon capture and storage projects that capture carbon dioxide emissions from industrial sources—such as cement plants, chemical plants, refineries, paper mills, and manufacturing facilities—and store the carbon dioxide in deep saline formations and other geologic systems.

The initial duration of each project selected is approximately seven months. Projects will be subject to further competitive evaluation in 2010 after successful completion of their Phase 1 activities.

Projects that best demonstrate the ability to address their mission needs will be in the final portfolio that will receive additional funding for design, construction, and operation.

Large-scale industrial carbon capture and storage selections announced today include:

- **Air Products and Chemicals Inc.** (Allentown, Pa.)—A state-of-the-art system to concentrate CO₂ from two steam methane reformer waste streams will be designed, constructed, and demonstrated at Port Arthur, Texas. More than one million tons of CO₂ will be delivered per year via pipeline for sequestration into the Oyster Bayou oilfield for enhanced oil recovery by Denbury Onshore LLC. (DOE Share: \$961,499)
- **Archer Daniels Midland Corporation** (Decatur, Ill.)—Archer Daniels Midland Company, a member of DOE's Midwest Geological Sequestration Consortium, will partner with other research organizations to demonstrate Dow ALSTOM's advanced amine process to capture CO₂ from industrial flue gases and sequester the CO₂ in the Mt. Simon Sandstone reservoir. (DOE Share: \$1,480,656)
- **Battelle Memorial Institute, Pacific Northwest Division** (Richland, Wash.)—Battelle researchers will partner with Boise White Paper LLC and Fluor Corporation to demonstrate geologic CO₂ storage in deep flood basalt formations in the State of Washington. Fluor Corporation will design a customized version of its Econamine Plus™ carbon capture technology for operation with the specialized chemical composition of exhaust gases produced from combustion of black liquor fuels. (DOE Share: \$500,000)
- **C6 Resources** (Salno, California)—Objective is to capture and transport by pipeline approximately one million tons per year of CO₂ streams from facilities located in the Bay Area, Calif., to be injected more than two miles underground into a saline formation. C6 Resources, an affiliate of Shell Oil Company, will conduct the project in collaboration with Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory. (DOE Share: \$3,000,000)
- **CEMEX Inc.** (Houston, Texas)—CEMEX USA will partner with RTI International to demonstrate a dry sorbent CO₂ capture technology at one of its cement plants in the United States. CEMEX will design and construct a dry sorbent CO₂ capture and compression system, pipeline (if necessary), and injection station. This commercial-scale carbon capture and sequestration demonstration project will remove up to one million tons of CO₂. (DOE Share: \$1,137,885)
- **ConocoPhillips** (Houston, Texas)—ConocoPhillips will demonstrate new advancements that improve conversion efficiency and economies of scale for carbon capture systems at a petcoke-based 683-megawatt integrated gasification combined cycle (IGCC) power plant adjacent to its existing refinery in Sweeny, Texas. About 85 percent of the CO₂ from the process stream will be captured and over five million tons sequestered into a depleted oil or gas field. (DOE Share: \$3,014,666)
- **Leucadia Energy LLC** (New York, N.Y.)—Partnered with Denbury Onshore, Leucadia Energy will demonstrate advanced technologies that capture and sequester more than 4 million tons of CO₂ emissions at the Lake Charles co-generation petroleum coke-to-chemicals (methanol) project to be located near Lake Charles, La. The project will transport compressed CO₂ through a 12-mile pipeline that connects to Denbury's Green Line pipeline system in Louisiana so that it can be used for enhanced oil recovery in the Hastings and Oyster Bayou oilfields in Texas. (DOE Share: \$540,000)
- **Leucadia Energy LLC** (New York, N.Y.)—Leucadia Energy and Denbury Onshore will demonstrate advanced technologies that capture and sequester CO₂ emissions from an industrial source. Mississippi Gasification LLC, a Leucadia affiliate, is building a petcoke-to-substitute natural gas plant in Moss Point, Miss., to demonstrate large-scale recovery, purification and compression of 4 million tons per year of CO₂. (DOE Share: \$840,000)
- **Praxair Inc.** (Danbury, Conn.)—Praxair will partner with BP Products North America, Denbury Resources, and Gulf Coast Carbon Center to demonstrate capture and sequestration of CO₂

emissions from an existing hydrogen-production facility in an oil refinery into underground formations for CO2 enhanced oil recovery. This demonstration will be performed at the BP refinery, and a lateral pipeline will be built to connect to Denbury's Green Pipeline to transport one million tons of CO2 per year. (DOE Share: \$1,719,464)

- **Shell Chemical Capital Company** (Houston, Texas)—The objective of this project is to capture, condition, and transport by pipeline approximately one million tons per year of by-product and off-gas CO2 streams from facilities located along the Mississippi River between Baton Rouge and New Orleans for geologic storage. (DOE Share: \$3,000,000)
- **University of Utah** (Salt Lake City, Utah)—More than one million tons of CO2 per year will be captured from various industrial sources, compressed, and transported via two new intra-state pipelines for CO2 enhanced oil recovery and deep saline sequestration research in Kansas. Beneath each enhanced oil recovery target, a major saline aquifer spanning most of the State of Kansas will be used for CO2 injection. (DOE Share: \$2,696,556)
- **Wolverine Power Supply Cooperative Inc.** (Cadillac, Mich.)—Investigators will demonstrate advanced amines and additives supplied by Hitachi and Dow to capture 300,000 tons of CO2 per year. Wolverine Power Supply Cooperative will be building a 600-megawatt circulating fluidized bed power plant near Rogers City, Mich. (DOE Share: \$2,723,512)

Additionally, the Department has also made conditional selections of 16 projects that demonstrate innovative concepts for beneficial carbon dioxide use. These conditional selections are subject to additional merit reviews and technical evaluation.

Secretary Chu Issues Call to Action on Carbon Capture and Storage Technology

Washington, D.C. - On October 12, 2009, U.S. Energy Secretary Steven Chu issued a letter to energy ministers gathered at the Carbon Sequestration Leadership Forum calling for an aggressive timeline for deploying carbon capture and storage technology. The letter, including details of U.S. support of clean coal technology programs, is available at:

http://fossil.energy.gov/programs/sequestration/publications/ccs_letter_s1.pdf