



the **ENERGY** lab

PROJECT FACTS

Clean Coal Power Initiative (CCPI 3)

Summit Texas Clean Energy, LLC: Texas Clean Energy Project: Pre-Combustion CO₂ Capture and Sequestration

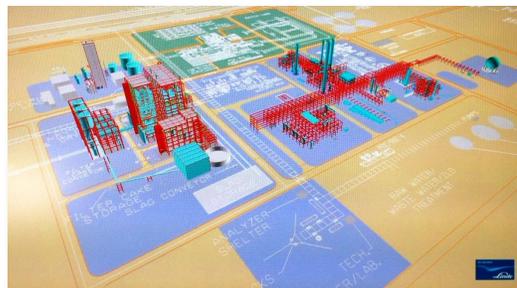
Background

A need exists to further develop and bring to commercial practice carbon management technologies that capture and store or beneficially reuse the carbon dioxide (CO₂) that would otherwise be emitted into the atmosphere from coal-based electric power generating facilities. Carbon capture, utilization and storage (CCUS) technologies offer great potential for reducing CO₂ emissions and mitigating mankind's contribution to global climate change without seriously impacting energy use or hindering economic growth.

Under the second closing of the Clean Coal Power Initiative (CCPI) Round 3 program, the U.S. Department of Energy (DOE) is providing financial assistance, including funding under the American Recovery and Reinvestment Act (ARRA) of 2009, to industry for the purpose of demonstrating the commercial viability of next generation technologies that will capture CO₂ emissions from coal-based electric power generating facilities and either store those emissions, or beneficially reuse them. Once demonstrated, the technologies can be readily considered in the commercial marketplace by the electric power industry.

Project Description

The Texas Clean Energy Project (TCEP) was awarded on January 29, 2010. The TCEP will be a greenfield integrated gasification combined cycle (IGCC) poly-generation facility with fully integrated CO₂ capture to be located in Penwell, Ector County, Texas. The TCEP will produce electricity for export to the grid and other high-value marketable products, including CO₂, urea, and sulfuric acid. The IGCC facility will deploy Siemens commercial gasification and power block technologies. Two SFG-500 (500 megawatt-thermal) gasifiers will produce syngas that will be quenched, cleaned and shifted to a high-hydrogen (H₂) concentration. The power block will consist of one SGT6-5000F combustion turbine, one triple-



Early Rendering of TCEP IGCC Facility

CONTACTS

Michael Knaggs

Director
Office of Major Demonstrations
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880
304-285-4926
michael.knaggs@netl.doe.gov

Jason Lewis

Project Manager
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880
304-285-4724
jason.lewis@netl.doe.gov

Karl Mattes

Participant Project Manager
Summit Texas Clean Energy, LLC
701B Winslow Way E
Bainbridge Island, WA 98110-2416
262-439-8007
kmattes@summitpower.com

PARTNERS

Blue Source
CH2M HILL
Fluor
Linde AG
R.W. Beck
Siemens
Texas Bureau of Economic Geology

NATIONAL ENERGY TECHNOLOGY LABORATORY

Albany, OR • Fairbanks, AK • Morgantown, WV • Pittsburgh, PA • Sugar Land, TX

Website: www.netl.doe.gov

Customer Service: 1-800-553-7681



U.S. DEPARTMENT OF
ENERGY

PROJECT DURATION

Start Date

02/01/2010

End Date

07/15/2017

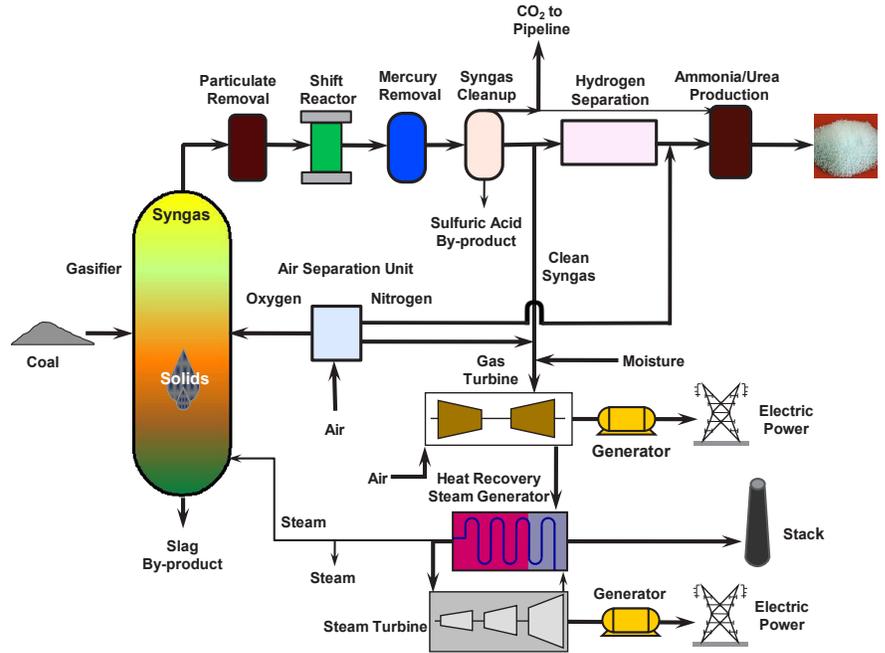
COST

Total Project Value

\$1,726,628,229



Government funding for this project is provided in whole or in part through the American Recovery and Reinvestment Act.



CO₂ Capture and Storage Concept

pressure heat recovery steam generator (HRSG) and one SST-900RH reheat steam turbine for power generation rated at 400 megawatts (gross). The facility will use water-gas shift and Linde Rectisol® acid gas removal technology to capture about 90 percent of the total CO₂ produced from the facility.

The captured CO₂ will be divided into two streams. About 21 percent of the CO₂ will be used in producing approximately 2,156 tons per day of urea fertilizer. The balance of the CO₂ will be compressed for transport by existing regional pipelines to oilfields in the west Texas Permian Basin for beneficial use in enhanced oil recovery (EOR) operations with concomitant geologic storage. The west Texas Permian Basin is the largest market in the world for CO₂-flood EOR.

Goals/Objectives

The project goal is to advance CCUS technologies from the demonstration stage to commercial viability. The project objective is to demonstrate CO₂ removal from the entire pre-combustion synthesis gas (syngas) stream of a green-field IGCC poly-generation facility, the compression and transport of the pipeline quality CO₂, and the monitoring, verification and accounting (MVA) of the disposition of the CO₂ used in EOR applications with concomitant storage.

Benefits

The Texas Clean Energy Project represents an important step in advancing the commercialization of technologies that capture CO₂ from pre-combustion syngas in existing and new electric generating power plants. Standards that limit CO₂ emissions from coal-based electric generation stations do not yet exist, but it is possible that this type of regulation may be enacted in the near future. By producing electricity and other marketable products, while simultaneously capturing and storing greenhouse gas emissions, the project will demonstrate that domestic coal can remain a viable energy source to meet the Nation's growing energy demands while minimizing the potential environmental impact. Additionally, the project will demonstrate that the poly-generation approach is an economical route for IGCC technology. Specific project benefits are as follows:

- The capture of up to 3,000,000 tons per year of CO₂ from the entire plant syngas stream prior to combustion.
- Long-term geologic storage of the captured CO₂.
- Increased domestic oil production, which will contribute to national energy security.
- A path forward for existing and new coal-based power plants to continue to provide economical energy production while meeting environmental sustainability goals.

