the ENERGY lab

PROJECT FACTS

Carbon Sequestration

Two Elk Energy Park Carbon Site Characterization Project

Background

The need exists to further explore research on carbon sequestration technologies to capture and store carbon dioxide (CO_2). Carbon capture and storage (CCS) technologies offer the potential for reducing CO_2 emissions and, in turn, mitigating global climate change without adversely influencing energy use or hindering economic growth. Deploying these technologies in commercial-scale applications requires adequate geologic formations capable of (1) sequestering large volumes of CO_2, (2) receiving CO_2 at an efficient and economic rate of injection, and (3) retaining CO_2 safely over extended periods. Five major types of geologic formations, each having their own unique opportunities and challenges, are being considered by the U.S. Department of Energy (DOE) for CO_2 storage. These include saline formations, coal seams, oil and gas reservoirs, organic shales, and basalt formations.

The DOE's National Energy Technology Laboratory (NETL) has selected 10 projects to receive more than $70 million in total funding to characterize promising geologic formations for CO_2 storage. The majority of this funding is provided by the American Recovery and Reinvestment Act of 2009 (ARRA) which was enacted to create new jobs, spur economic activity, and promote long-term economic growth. The 10 projects will provide greater insight into the potential for geologic formations across the United States to safely and permanently store CO_2 and further advance DOE's efforts to refine a national assessment of CO_2 storage capacity in deep geologic formations.

Project Description

The North American Power Group Ltd. (NAPG), Stanford University, Montana State University, and Petrotek Engineering Corporation will study CCS options located near the Two Elk Energy Park in northeastern Wyoming. The project will include analyzing existing data, data collection, drilling and completing a characterization well, modeling, risk assessment and mitigation, and data integration and sharing. As part of this project, NAPG will conduct a preliminary site characterization of regionally significant saline formations near the Two Elk Energy Park in an attempt to demonstrate that the saline formations below this area provide a viable and safe opportunity for CCS for a large fraction of the region's CO_2 emissions.

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PARTNERS

Montana State University

Petrotek Engineering Corporation

Stanford University

PROJECT DURATION

Start Date
12/08/2009

End Date
12/07/2012

COST

Total Project Value
$6,690,839

DOE/Non-DOE Share
$4,949,962/$1,740,877

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

Goals/Objectives

The goal of this project is to characterize multiple formations in the south-central part of the Powder River Basin (PRB) near the Two Elk Energy Park that are currently being developed by NAPG. The characterization project represents the initial geologic characterization required to conduct a large volume commercial sequestration project as part of the proposed Two Elk Energy Park Carbon Project.

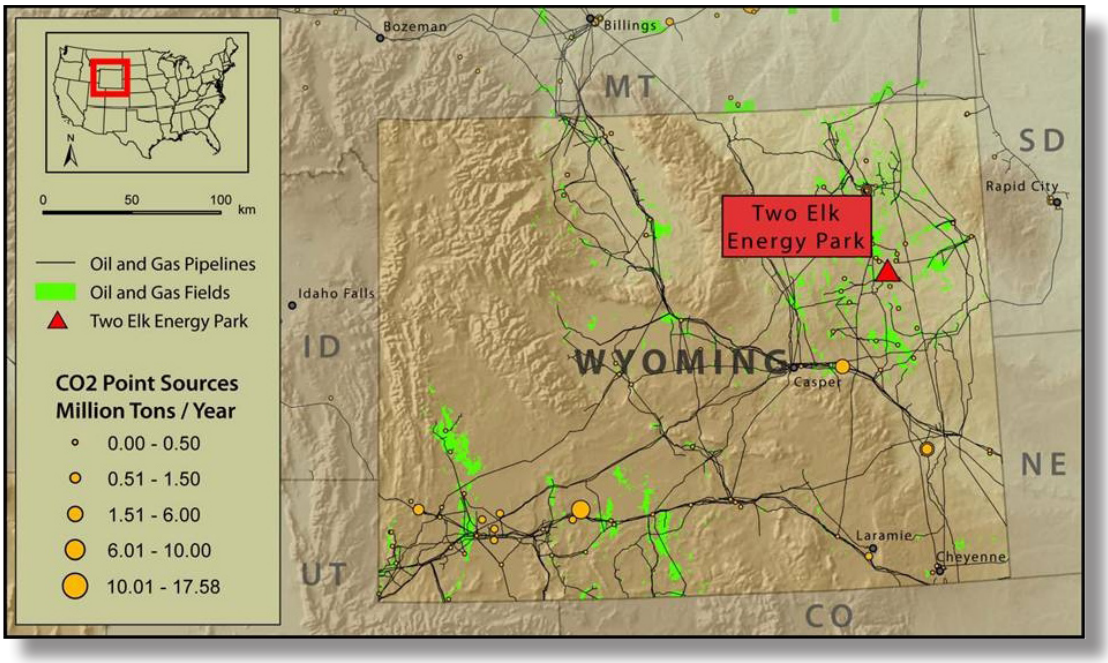
The primary objective of this project is to investigate the technical feasibility of carbon storage in the saline formations underlying the Energy Park site to the Precambrian Basement by assessing capacity, injectivity, containment system, potential leakage pathways, risk assessment, well bore management, and produced fluid management.

Project goals specific to the DOE Carbon Sequestration program include participation in technical working groups on best practices for geologic site characterization and augmenting existing data sets through coordination with the National Carbon Sequestration Database and Geographic Information System (NATCARB).

Benefits

The overall effort will provide greater insight into the potential for geologic formations across the United States to safely and permanently store CO_2. The information gained will further the DOE effort to refine a national assessment of CO_2 storage capacity in deep geologic formations.

Specifically, the Two Elk Energy Park Carbon Site Characterization Project can potentially provide a viable sequestration site and valuable opportunities for research and development in the PRB, an area that holds vast reserves of coal and other resources. By demonstrating the potential for CCS commercialization, this project could have a significant economic impact on the region, setting the stage for construction of additional facilities and job creation.



Existing regional CO_2 point sources in relation to the Two Elk Energy Park