

Greenhouse Gas Mitigation through Carbon Storage in Deep Geologic Formations

Background

Battelle is a global leader in developing strategies for meeting the climate change challenge and developing a broad portfolio of real-world carbon management solutions such as geologic sequestration. Battelle researchers have been working with the U.S. Department of Energy's National Energy Technology Laboratory since the 1990s to explore the potential of using deep geologic formations as a means of sequestering CO₂. Storage in deep saline formations, depleted oil fields, coal seams, and other rocks is considered a very promising and realistic long-term option for reduction of greenhouse gases from large point sources. Moreover, many of these formations are often located in close proximity to major point sources of greenhouse gas emissions such as fossil-fuel power plants, refineries, and chemical plants. The pathbreaking research on climate change technology strategy being conducted at the Joint Global Change Research Institute – jointly run by Battelle, Pacific Northwest National Laboratory, and University of Maryland – provides a strong foundation to ensure that the sequestration technology work remains relevant to the emerging needs for meeting the climate change challenge.

Battelle is working on a variety of projects to implement CO₂ storage:

- The Ohio River Valley CO₂ Storage Project at Mountaineer Plant** – Under this flagship project being hosted by AEP's state-of-the-art 1,300 MW coal-fired plant in West Virginia, a 9,200-ft-deep exploratory well was drilled and tested to evaluate the potential for geologic storage in deep sandstone and carbonate rocks. A seismic survey was conducted to evaluate the geology and safety of storage. The ongoing effort includes assessment of CO₂ sources, regulatory, and monitoring issues. This may be followed by the field injection and monitoring tests. Research sponsors include the Department of Energy, AEP, BP, Schlumberger, Battelle and its Pacific Northwest Division, Ohio Coal Development Office of the Ohio Department of Development (OCDO), and others.
- Midwest Regional Carbon Sequestration Partnership** – Battelle leads a research team to evaluate carbon sequestration in the Midwestern United States (www.mrcsp.org). The partnership includes geological surveys and prominent geologic data repositories in seven states, seven regional universities, and several industry and private companies. The objective of the partnership is to investigate and demonstrate carbon sequestration at a variety of locations throughout the Midwest to bring research, technology, and industry together.
- Carbon Sequestration Infrastructure Development** – Battelle continues to evaluate regional CO₂ storage reservoirs in the Midwestern United States and other areas. Work includes collaboration with exploratory oil and gas drillers in the region to better understand sequestration opportunities at a highly reduced cost, modeling and deployment assessment, and supporting the energy industry in evaluating carbon sequestration options for their future facilities planning.
- Joint Effort with Japanese Electric Power Industry** – Battelle is working with the Japanese Central Research Institute of Electric Power Industry (CRIEPI) to evaluate containment and long-term storage in the Ohio River Valley. This international collaboration is intended to advance an understanding of CO₂ sequestration science and risk assessment.

Benefits

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Evaluating the feasibility of CO₂ storage at several different scales will allow the energy industry to prove the viability of an evolving technology and allow power plants and other industries to mitigate carbon emissions as our nation develops a strategy to deal with the buildup of greenhouse gases in the atmosphere. Ultimately it will help protect the investments made in these industries and especially the economic infrastructure of the Midwestern region, which is so heavily dependent on the affordable energy supplied by fossil fuels.

