

Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centers and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers. Headquartered in Columbus, Ohio since its founding in 1929, Battelle serves the national security, health and life sciences, and energy and environmental industries. For more information, visit www.battelle.org.

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CARBON MANAGEMENT SERVICES

Meet your carbon dioxide emission reduction goals and be poised to take advantage of monetary incentives through advanced carbon storage technologies.

Battelle provides integrated, complete value chain solutions to help monetize and decrease overall carbon dioxide emissions. We can help you control costs, reduce environmental impact and lessen risks with low-carbon energy solutions that are environmentally sustainable and economically viable.

OUR EXPERTS

Our geoscience and engineering experts leverage broad expertise gained from decades of experience designing and managing carbon capture, utilization and storage (CCUS) programs including those related to saline storage and carbon dioxide-enhanced oil recovery. Battelle's depth and breadth of experience – including geologic assessment, construction and operations – makes us the best choice partner for your operations.

OUR WORK

Battelle is a global leader in developing strategies for real-world carbon management solutions and energy technology integration such as geologic storage and CO₂ enhanced oil recovery. 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 for CO₂ storage from power plants, petrochemical facilities, biofuels, and other industrial sources. Storage in deep saline formations, depleted oil fields, coal seams, and other rocks is considered a very promising and realistic long-term option for carbon management with new technologies and economic opportunities.

Utilizing New Tax Credit Opportunities

New federal 45Q tax credits are available for companies that capture and store carbon emissions in geologic formations or use CO₂ enhanced oil recovery (EOR) to extract oil from existing wells. These credits present a possible multimillion-dollar revenue stream for early adopters. Battelle can help you position your company to evaluate, construct and optimize your ability to leverage the 45Q tax incentives.

Here are the details:

- Capture and store carbon emissions in geologic formations to receive credit up to \$50 per metric ton of CO₂
- Use CO₂ EOR to extract oil from existing wells for up to \$35 credit per metric ton of CO₂

Initial investments for site screening and assessment for CO₂ EOR and CO₂ storage potential are minimal when compared to the possible tax credit advantages. Contact Battelle today to discuss site screening opportunities.

OUR SERVICES

Protect your fuel assets with integrated strategies for carbon storage and utilization. We provide end-to-end service – from site selection to operations support.

STORAGE ASSESSMENT

Maximize your subsurface resource potential by leveraging Battelle's proprietary storage reservoir database and modeling tools to accurately characterize deep geologic formations. We also can help you determine what opportunities your plant may have to leverage tax incentives.

- Screening studies
- Geologic characterization
- Reservoir modeling
- Well design, installation and operation
- Well testing and evaluation
- Monitoring
- Feasibility and risk assessment
- Project management

CONSTRUCTION

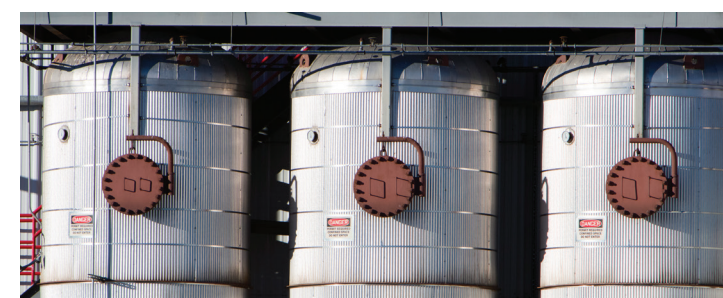
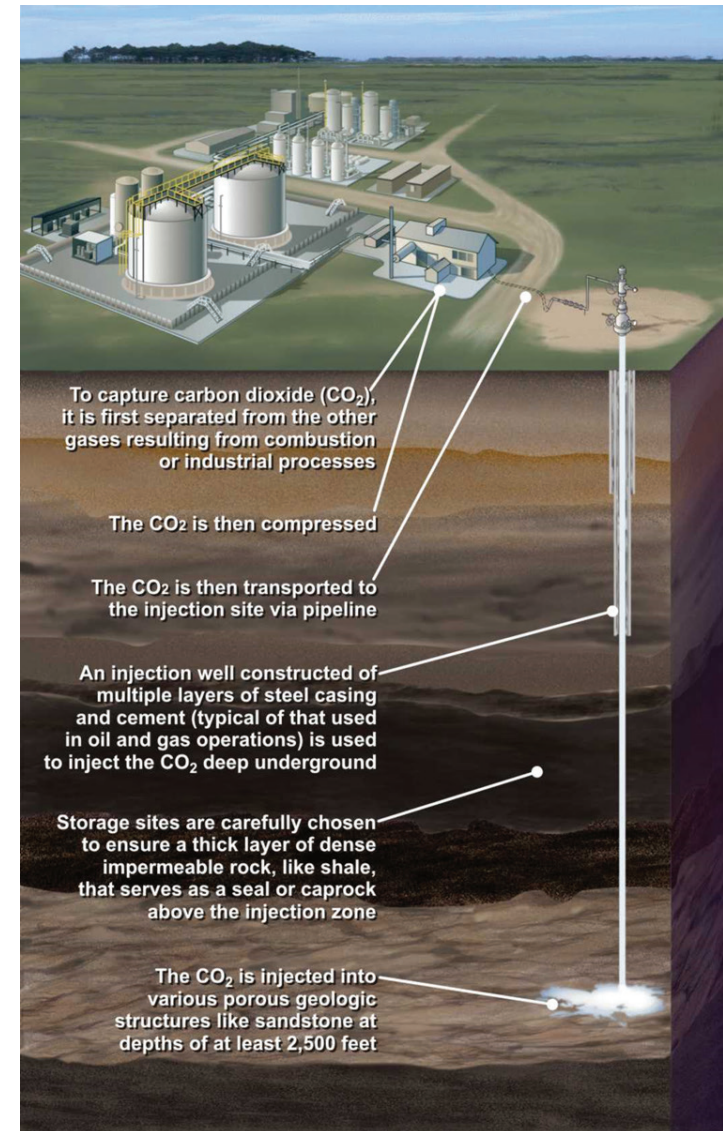
Count on Battelle to design and construct a full-scale system that includes all aspects of a CCUS program.

- Geologic characterization wells
- Well design and drilling
- Reservoir modeling
- Integrated data management

OPERATIONS

Meet health, safety and environmental objectives with defensible data and analysis. We can accurately assess potential operational impacts from subsurface resource utilization.

- Regulatory compliance
- Stakeholder involvement
- Best practices guidance
- Environmental monitoring



Our Work in Action

The Ohio River Valley CO₂ Storage Project at Mountaineer Plant

Under this flagship project hosted by American Electric Power's (AEP's) state-of-the-art 1,300 MW coal-fired plant in West Virginia, Battelle collaborated with AEP to complete the world's first facility validation scale integrated CO₂ capture and storage (CCS) test at a coal-fired power plant. Battelle's work included permitting, drilling of six injection and monitoring wells, monitoring and modeling. The methodologies and analytical tools developed for this project will be used to further advance the industry toward commercial-scale integrated carbon management solutions.

Midwest Regional Carbon Sequestration Partnership

Battelle leads a research team to evaluate carbon sequestration in the Midwestern United States. The partnership includes geological surveys and prominent geologic data repositories in 10 states, 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. The MRCSP team was successful at implementing a 1 million metric ton industrial-scale CO₂ EOR project in the Michigan Basin.

Integrated Midcontinent Stacked Storage Hub

The Integrated Midcontinent Stacked Carbon Storage Hub (IMSCS-HUB) project is studying carbon capture, utilization and storage (CCUS) in Nebraska and Kansas with the objective of creating a commercial CO₂ CCUS project in the region by 2026. CCUS includes storage of CO₂ in saline units (saline aquifers) and CO₂ used for EOR (CO₂-EOR). The project involves collecting CO₂ at Nebraska ethanol plants and moving it to southwest Nebraska and western Kansas for utilization and storage.

Understanding Risks from Old Wellbores

Battelle is performing a systematic assessment of wellbore integrity for potential carbon storage. Oil and gas areas have perceived risk for well integrity due to long drilling history. However, many of the old wells may not present realistic risk for deep storage applications because they are shallow, depressurized, or properly plugged and abandoned. The project is evaluating well status and specifications for risk mitigation by (1) compiling well plugging and abandonment data; (2) compiling cement bond logs for case studies; and (3) analyzing regional data sets in terms of depth, age, formation and spatial distribution. This project will provide operators with a systematic methodology to reduce the risk of stray gas migration due to existing and/or abandoned wellbores utilizing available regulatory and industry data.