

# CARBON MANAGEMENT SERVICES



## 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 CO<sub>2</sub> 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.

We offer real-world solutions for geologic storage and CO<sub>2</sub> EOR. Battelle provides the full range of services for applied research, development and deployment of subsurface carbon management. Our energy researchers have participated in CO<sub>2</sub> storage projects since the 1990s, with a successful track record of project deployment at power plants, EOR fields and other industrial sources.

## OUR EXPERTS

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. The Battelle energy team comprises geoscientists, engineers and technicians who have the expertise to help deliver on these opportunities.

## OUR SERVICES

- Site screening for CO<sub>2</sub> EOR and CO<sub>2</sub> storage
- Feasibility/FEED studies
- Detailed design studies
- USEPA Class 6 UIC permitting
- Geologic/reservoir characterization studies (drilling/testing)
- Reservoir simulation modeling
- Injection infrastructure design (wells, instrumentation, booster pumps, metering)
- Integration with pipeline/capture systems
- CO<sub>2</sub> monitoring program design – Class VI, Subpart RR “MRV” Plans
- Storage-site operation and monitoring
- Lifecycle analysis for greenhouse gas emissions
- Well-bore integrity analysis for CO<sub>2</sub> applications
- Geomechanical analysis and simulations for subsurface stress conditions
- Source-sink integration and development for CO<sub>2</sub> hubs and trunklines
- Post injection site closure

## Federal 45Q Tax Incentive

- Capture and store carbon emissions in geologic formations to receive credit up to \$50 per metric ton CO<sub>2</sub> by 2024
- Use CO<sub>2</sub> EOR to extract oil from existing wells for up to \$35 credit per metric ton CO<sub>2</sub> by 2024

Initial investments for site screening and assessment for CO<sub>2</sub> EOR and CO<sub>2</sub> storage potential are minimal when compared to the possible tax credit advantages. Contact Battelle to discuss site screening opportunities today.





## OUR EXPERTISE IN ACTION

### The Ohio River Valley CO<sub>2</sub> 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 CO<sub>2</sub> 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. Currently the MRCSP team ([www.mrcsp.org](http://www.mrcsp.org)) is implementing a 1 million metric ton industrial-scale CO<sub>2</sub> EOR project in the Michigan Basin.

### FutureGen

Battelle coordinated the alliance for the DOE initiative to create FutureGen, a public-private partnership to design, build and operate the world's first coal-fueled, "zero emissions" power plant. The Battelle team led the subsurface characterization, test well drilling, CO<sub>2</sub> injection system design and Class VI EPA permitting for the project.

### CO<sub>2</sub> EOR and Reservoir Management

Battelle provides reservoir engineering, modeling and testing to assess CO<sub>2</sub> EOR and associated carbon storage in depleted oil fields. Battelle has implemented several huff-n-puff tests along with full-scale characterization, metering and monitoring a CO<sub>2</sub> EOR system in Michigan.

### CO<sub>2</sub> Storage and Pipeline Screening and Feasibility

Battelle provides detailed analysis of CO<sub>2</sub> storage options, pipeline routes, geohazards, life-cycle analysis and economic aspects for industry clients and government. Battelle also supports implementation of 45Q credit for CO<sub>2</sub> storage and EOR. Battelle leads the Integrated Mid-Continent Stacked Storage Hub connecting CO<sub>2</sub> storage with ethanol plants in Nebraska and Kansas. Work includes test well drilling, seismic surveys and geophysical analysis.

### Carbon Sequestration Infrastructure Development

Battelle continues to evaluate regional CO<sub>2</sub> storage reservoirs in the United States, Japan, Mexico, South Africa, Indonesia and other locations. 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 support of the energy industry in evaluating carbon sequestration options for their future facilities planning.

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](http://www.battelle.org).

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