Welcome to MRCInfo, a newsletter created to share the latest news from the Midwest Regional Carbon Initiative and the ever-growing field of Carbon Capture, Utilization, and Storage.

MRCInfo

News from the Midwest Regional Carbon Initiative

MARCH 2024

In this issue, read about...recent DOE selections and Requests for Information, the kerfuffle about primacy in Louisiana, access new carbon dioxide-related Fact Sheets, and much more!

Class VI Permit Issued to Wabash Valley Resources

On Wednesday January 24, the U.S. Environmental Protection Agency (EPA) issued a Class VI permit to Wabash Valley Resources, accelerating carbon capture and storage (CCS) in the MRCI region. This Class VI permit will allow Wabash Valley Resources to construct two carbon dioxide (CO_2) storage wells to capture CO_2 from their gasification plant in West Terre Haute, Indiana. The company estimates they can capture and store 1.65 million metric tons of CO_2 annually, which will be stored across the two wells. The next step for Wabash Valley Resources to begin injection is the pre-operation phase, which requires them to conduct tests and install monitoring technologies to further analyze the geology in Indiana and submit their findings to the EPA. If there are no issues from the tests, Wabash Valley Resources can begin injecting CO_2. The gasification plant is planning to produce hydrogen, which will be used to make ammonia fertilizer.

WABASH VALLEY RESOURCES

The permit that the EPA issued to Wabash Valley Resources is a significant step in promoting carbon storage in the United States. This is the first permit issued by the Federal EPA in a decade, the last permit being issued to an ethanol plant in Illinois in 2014. The process to obtain a Class VI permit is lengthy due to the level of thoroughness with which

the EPA reviews each permit application. For many companies, their applications have been under review for over two years. Prior to issuance, Wabash Valley Resources was one of the 179 well applications being reviews by the EPA. The EPA is working to decrease the amount of time it takes to issue Class VI permits, working to keep the time frame within 24 months.

On July 7, 2023, the EPA released two draft permits to the public as part of the Public Comment Period, which is an opportunity for the public to review and comment on the drafts and included a public hearing. In response to the comments, the EPA issued a 34-page document that responded to these comments. The general scope of the comments that the EPA responded to covers 27 topics, which include concerns about the suitability for carbon sequestration, protection of Underground Sources of Drinking Water (USDW), and environmental justice. Check out the full report.

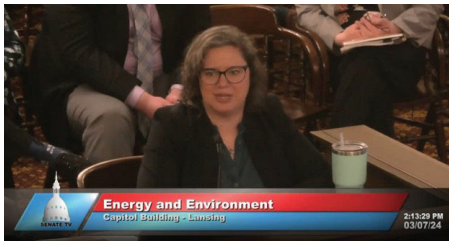
Read Wabash Valley Resources' comments on the issuance of draft permits in July 2023 here.

Co-Principal Investigator Neeraj Gupta's Impactful Career Advancing the Deployment of CCS

Co-Principal Investigator for the MRCI Neeraj Gupta was recently featured in an article published in Battelle's blog "Inside Battelle" that discussed his long career promoting CCS and his dedication to climate resilience and mitigation. From a growing interest in applied science and geology that started during his studies growing up, Gupta set the stage for his groundbreaking work in CCS. Read more about his career in CCS and at Battelle here.

Michigan Geological Survey Shares CCUS Knowledge with State Senate Committee

Assistant Director of the Michigan Geological Survey and Director of the Michigan Repository for Research and Education (MGRRE), Autumn Haagsma, Ph.D., testified before the Michigan State Senate Energy and Environment Committee on March 7, 2024, to share information about Carbon Capture Utilization and Storage and the research the survey has done into the process. Haagsma shared facts about the Michigan Geological Survey and their programs, discussed the MGRRE and their enormous inventory of core, and offered a short course on CCUS easily understood by non-technical audiences. Watch her testimony, which starts at the 1:12:27 mark, at this link to Michigan Senate TV.



Michigan State Senate televised meeting 3/7/2024

U.S. DEPARTMENT OF ENERGY
Fossil Energy and Carbon Management

DOE Issues CO_2-capture, transport, and storage related RFIs and Project Selections

The US Department of Energy continues work toward providing funding for and understanding needs for carbon management projects across the country. Recent awards in the MRCI region include:

GTI to Test Capture System at Braddock, Pa., Steel Plant

GTI Energy recently received notification of award to test an engineering-scale ROTA-CAP CO_2 capture system on real flue gas conditions at U.S. Steel's Edgar Thomson industrial iron and steel production facility in Braddock, Pennsylvania. The project seeks to demonstrate the readiness of this technology for further scale-up in a hard to abate manufacturing sector.

Battelle launches Pre-FEED Study for Intermodal CO_2 Transport Hub

MRCI co-Lead Battelle received funding to develop its Central Appalachian Basin CO_2 National Network for Enhancing Carbon Transport Infrastructure Onshore/Offshore (CO2NNECTION) project to explore CO_2 transport

and storage networks in the Central Appalachian Region and northeastern United States. The objective of the proposed project is to conduct a pre-FEED study to develop an optimized and strategically adaptable transport hub for CO_2 in the Appalachian Basin that supports the transport of various quantities, qualities, and phases of CO_2 including a plan for near-term operation and long-term growth.

Capturing Carbon from a Cement Plant

The Ohio State University (OSU) and GTI Energy team up to deploy membrane technology to capture 95-99% of CO_2 from a cement kiln operated by Holcim in South Carolina. The technology developed by OSU will reduce energy consumption and reduce costs for carbon capture, which is a major selling point for Holcim. This technology demonstration, funded in part by the U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management (FECM), creates a pathway for other cement plants to retrofit their facilities and make the industry more sustainable. Read more about this partnership here.

Mid-Scale Commercial Direct Air Capture Facility Request for Information

On February 29, 2024, DOE's Office of Clean Energy Demonstrations (OCED) issued a Request for Information (RFI) to seek input on interest, potential structure, benefits, and risks of mid-scale commercial direct air capture (DAC) facilities. OCED hopes to hear from investors, developers, academia, research laboratories, government agencies, potentially impacted communities, and other entities to gain insights into the role of these facilities in commercialization plans and how DOE can support DAC development. To read more about the RFI, check out their post here.

Request for Information for Hard-to-Abate Industries

On January 29, 2024, DOE's Office of Fossil Energy and Carbon Management released a Request for Information (RFI) to understand what is needed to accelerate deployment of CCS for industrial systems to support the energy transition, eliminate greenhouse gas emissions, produce clean energy, create well-paying union jobs, and enable a net-zero carbon emissions economy by 2050, all while prioritizing environmental equity and support for underserved communities. FECM is focused on 11 industries for this RFI, which are petrochemical, ammonia, aluminum, iron-steel, refining, soda ash, lime, pulp and paper, cement, glass, and LNG. To read more about the RFI and the industries the FECM is focusing on, check out their post here.

Check out this link to read through all the current funding announcements available through FECM.

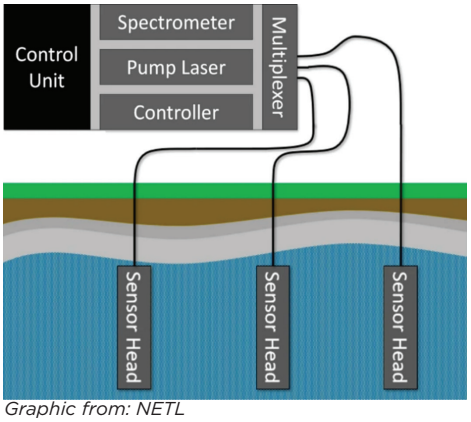
PROJECT SPOTLIGHT

DOE Office of Fossil Energy and Carbon Management Fund Projects Selected for FOA 2799 in the MRCI Region

The US Department of Energy Office of Fossil Energy and Carbon Management recently awarded funding to a number of projects in the MRCI region from FOA 2799: Regional Initiative to Accelerate Carbon Management Deployment: Technical Assistance for Large Scale Storage Facilities and Regional Carbon Management Hubs. The projects awarded funding include:

- Supporting Communities and Industry for Mid-Atlantic Offshore Carbon Storage Hub Development to Battelle Memorial Institute.
- A Play-Based Exploration of Carbon Capture and Storage Potential of the Illinois Basin to the Board of Trustees of the University of Illinois.
- The Central Appalachian Partnership for Carbon Storage to the Pennsylvania Department of Conservation and Natural Resources
- Advancing Carbon Capture, Utilization, and Storage in the Michigan Basin to Western Michigan University
- Characterization of Subsurface Energy Opportunities to Accelerate Carbon Capture, Utilization, and Storage in Indiana to the Trustees of Indiana University.
- Advancing Carbon Capture, Utilization, and Storage in the Michigan Basin to Western Michigan University

Improvements to Leak Detection for Underground CO_2 Storage Sites



Graphic from: NETL

Two researchers from the from the National Energy Technology Laboratory (NETL) Dustin McIntyre and Daniel Hartzler were recently awarded a patent for their improvements to laser technology used to detect leaks at CO_2 storage sites. The technology, titled "Downhole Laser System with an Improved Laser Output Production and Data Collection," is low-cost and requires a very small sample size to be effective. It is sensitive to changes in light and heavy elements, is durable, and deployed in-situ for quick detection of any hazards. As the need for CCS increases to achieve global climate goals, this technology helps improve the overall safety of CCS by reducing the chances of major groundwater impacts for long-term CO_2 storage solutions. Read more about the technology here.

LEARNING OPPORTUNITIES

Journal Article Covering Geophysical Methods as Applied to Carbon Storage Published

Scientists from Lawrence Berkley National Lab, Battelle, and Orinda Geophysical recently published an article in the *Leading Edge* – a journal published by the Society of Exploration Geophysicists – discussing the potential growth of geophysical methods as applied to geologic carbon storage (GCS) projects in the United States by summarizing planned geophysical methods and proposed project sizes from publicly available Class VI permit applications. In the paper, the authors noted the dominant geophysical technologies in the Class VI permits across the United States, estimated how many geophysical surveys will need to be processed versus newly acquired by 2050, and projected the seismic crews needed if the U.S. achieves the net-zero greenhouse gas emissions goal by 2050. Check out the full article here.

Solving the Timing Issue for CCS Facilities

Researchers at Carnegie Mellon University's College of Engineering completed a study that estimated the time required to develop, approve, and implement a CCS facility within the U.S. What they found was that the majority of facilities took an amount of time that is deemed far too long to meet the U.S.'s climate goals, noting that this was mostly due to the approval process. This may also limit a CCS facility's eligibility for 45Q tax credits, set to expire at the end of 2032. The paper offers seven strategies that could shorten the approval timeline for federal agencies and state and federal government. Learn more about the strategies here or read the full paper here.

Roads to Removal

A report published by 68 scientists from 13 different institutions outlining pathways to address the increasing need for CO_2 removal to achieve net-zero emissions by 2050. In the report, they outlined various techniques for removing CO_2 at the county level based on feasibility, capacity, impact, and cost. Regarding CCS, the report analyzes the costs of transporting and storing CO_2 underground and has an interactive map that shows these details at the county level. The report also has an analysis of equity and environmental justice, an EEEJ Index developed by the report authors that accounts for the resources in a given county, the challenges they are facing, and how their history may contextualize new projects for each CO_2 removal method. Read the full report here.

EPA Gives Louisiana Primacy over Class VI Wells

On December 28, 2023, the U.S. Environmental Protection Agency (EPA) gave Louisiana the primary regulatory authority (primacy) over Class VI wells, the wells used to inject carbon dioxide underground. Louisiana is the third state to be granted primacy after Wyoming was granted primacy in 2020 and North Dakota in 2018. With primacy, Louisiana has the authority to grant Class VI permits, a responsibility that fell under the EPA's authority prior to this decision. This decision expands the carbon capture and storage industry in Louisiana, a major milestone in the state's climate goals. Read more about the decision here.

This decision isn't without controversy. The recent ruling sparked pushback from environmental groups and NGOs seeking to revert the decision. A lawsuit filed in mid-February 2024 in the 5th U.S. Circuit Court of Appeals in New Orleans by Earthjustice and Louisiana-based organizations like the Deep South Center for Environmental Justice, Healthy Gulf, and the Alliance for Affordable Energy, seeks to revert the authority over Class VI wells back to the EPA and claim that Louisiana's regulatory standards are less rigorous than the EPA's standards – a necessary requirement for a state to be granted primacy. These groups also expressed concerns that the quickened permit approval rate would endanger the environment and community health, primarily the predominantly Black communities near industrial sites. Read more about the lawsuit and the concerns surrounding it here.

West Virginia Refines Class VI Primacy Application

In early February, the Senate Energy Committee approved a new law that would provide further assurance to the EPA regarding West Virginia's application for primary enforcement authority (primacy) over Class VI CO_2 injection wells. If the bill is passed, the West Virginia Department of Environmental Protection will be granted primacy over the regulation of Class VI wells. An important component of this law is that the liability release period of CO_2 wells is increased from 10 to 50 years. This change will further ensure the safety of people and water supply by extending the time requirement for monitoring Class VI wells. For more information on this development, read more or read Senate Bill 596.

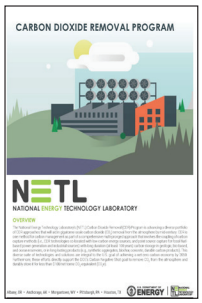
New Rules that Expand the Clean Energy Tax Credits Supported by the Inflation Reduction Act

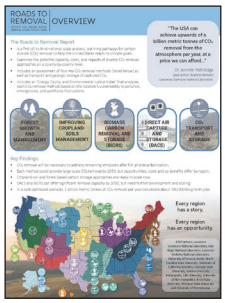
The U.S. Department of Treasury and the Internal Revenue Service (IRS) released their final rules on key provisions in the Inflation Reduction Act (IRA) that expand the clean energy tax credits in order to help more projects be built at a quicker and more affordable rate. The new rules target renewable energy projects that are co-owned so that they can elect out of partnership tax status and therefore access elective pay. To read more about the new rule, read the press release issued by the U.S. Department of Treasury here.

FACT SHEETS

Fact Sheet Information

The National Energy Technology Laboratory's (NETL) Point Source Carbon Capture (PSCC) Program is developing the next generation of advanced carbon dioxide (CO_2) capture concepts to support the United States in achieving ambitious goals for a greenhouse gas (GHG)-neutral economy by 2050, a carbon-pollution-free power sector by 2035, and a 50% reduction from 2005 levels in economy-wide net GHG pollution by 2030. This Fact Sheet explores how.





This Fact Sheet describes the National Energy Technology Laboratory's (NETL) Carbon Dioxide Removal (CDR) Program diverse portfolio of CDR approaches that will aid in gigatonne-scale CO_2 removal from the atmosphere by mid-century. CDR is one method for carbon management as part of a comprehensive multi-pronged approach that involves the coupling of carbon capture methods with long duration (at least 100 years) carbon storage in geologic, bio-based, and ocean reservoirs, or in long-lasting products (e.g., synthetic aggregates, biochar, concrete, durable carbon products).

Supporting the Roads to Removal national-scale analysis, outlining pathways for carbon dioxide (CO_2) removal to help the United States reach its climate goals, this Fact Sheet includes a detailed map of CO_2 removal pathways by region and a summary of the project's key findings.

IN THE NEWS

Germany Plans to Begin Offshore Underground CO_2 Storage

LATEST NEWS

Germany announced plans to enable underground CO_2 storage at offshore sites with the goal of offsetting hard to abate industries such as cement. The goal with this move is to reach net zero by 2045, a goal that will need to utilize carbon storage in the industrialized country. Robert Habeck, the country's economy and climate minister, is promoting the technology as a solution that is mature, safe, and will help the world limit global warming to the 1.5 degrees Celsius goal set in the Paris Agreement. Read more about the recent development here.

Valero Energy Corp Joins Largest Carbon Capture Project

Valero Energy Corp joins the CCS project proposed by Iowa-based Summit Carbon Solutions. This partnership includes an agreement by Valero to transport CO_2 from 8 of their ethanol plants into Summit's proposed pipeline. This partnership will lead to he capture of 3.1 million metric tons of CO_2 annually. Read more about the partnership here.

Colorado Introduces Bill to Promote CCS

In late February, a bill was introduced in Colorado that would expand the Colorado Energy and Carbon Management Commission's ability to regulate and promote CCS. This legislation would define important components to CCS projects, such as the ownership of pore space, that would help promote the practice across the state. Read more about the proposed bill here.

RELATED UPCOMING EVENTS

Decarbonization Summit 2024: Industrial Gases and Clean Energies
Jersey City, NJ – April 8-11, 2024
Link to Event

Innovations in Climate Resilience
Washington D.C. – April 22-24,2024
Link to Event

Carbon Capture and Storage Summit
(co-located with the International Fuel Ethanol Workshop and Expo)
Minneapolis, MN – June 10-12, 2024
Link to Event

Carbon Capture Technology Expo North America
Houston, TX – June 26-27, 2024
Link to Event

Carbon Capture World Expo and Conference
Essen, Germany – June 26-27, 2024
Link to Event

The International Meeting for Applied Geoscience and Energy (IMAGE)
Houston, TX – August 26-29, 2024
Link to Event

GHGT-17 Conference
Calgary, Alberta, Canada – October 20-24, 2024
Link to Event

Like what you see?
Have ideas for future features?
Want your news or resources spotlighted?
Email us!

The Midwest Regional Carbon Initiative is a structured five-year program funded by the Department of Energy. The MRCI is co-led by Battelle and the University of Illinois and comprised of team members from multiple state geological surveys, academic institutions, and industry. Backed by more than 20-years of experience in the field, the initiative works to connect science, technology, and research to advance CCUS in 20 states across the Midwest, Mid-Atlantic and New England regions.

BATTELLE MRCI Midwest Regional Carbon Initiative ILLINOIS

MRCI Midwest Regional Carbon Initiative