U.S. DEPARTMENT OF ENERGY | OFFICE OF FOSSIL ENERGY AND CARBON MANAGEMENT

U.S. DEPARTMENT OF ENERGY | NATIONAL ENERGY TECHNOLOGY LABORATORY

CTSN CARBON TRANSPORT and STORAGE NEWSLETTER

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This newsletter was compiled by the National Energy Technology Laboratory to provide information on recent activities and publications related to carbon transport and storage. It covers domestic, international, and public and private sector news in the following areas:

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DOE/FECM/NETL HIGHLIGHTS

DOE Announces Projects to Provide Regional Technical Assistance to Advance CCS Deployment

The U.S. Department of Energy (DOE) announced that 16 projects across 14 states will receive funding to provide locally tailored technical assistance and enhanced stakeholder engagement around carbon management technologies. The projects aim to connect carbon management developers with local communities to foster collaboration and education toward the advancement of commercial deployment of carbon capture, transport, and storage technologies across the United States. The funding will enable organizations with extensive experience and unique skill sets in carbon capture, transport, and storage to provide technical information and procedural assistance to industry and business partners with a vested interest in commercial-scale carbon management. DOE's National Energy Technology Laboratory (NETL), under the purview of DOE's Office of Fossil Energy and Carbon Management (FECM), will manage the selected projects.

From *NETL*. July 2023.

CONTINUE

DOE/FECM/NETL HIGHLIGHTS *(cont.)*

NETL Using BIL Funding to Develop Database to Support CO_2 Storage Site Selection

The CO_2-Locate database—a centralized platform that enables users to obtain data quickly and accurately—is now published on NETL's ***Energy Data eXchange (EDX)***. Developed with ***Bipartisan Infrastructure Law (BIL)*** funding, the database is designed to support more efficient and effective carbon capture and storage (CCS) site selection, risk analysis, and other key stakeholder needs, and includes the start of an integrated national well dataset representing open-source wellbore data from disparate state and federal entities. Leveraging existing NETL research and development (R&D) technologies, CO_2-Locate's high-level analytics will give researchers a better understanding of the age, total vertical depth, and status of wells across the country, allowing them to make informed site-selection decisions.

From *NETL*. July 2023.

ANNOUNCEMENTS

DOE Funds DAC Facilities

DOE announced funding to advance the development of two commercial-scale direct air capture (DAC) facilities in Texas and Louisiana. The projects are expected to remove more than 2 million metric tons of CO_2 emissions from the atmosphere each year.

From *energy.gov*. August 2023.

DOE Announces Funding to Speed Up Adoption of Carbon Management Technologies

DOE announced the availability of funding to support states, local governments, and public utilities in purchasing products derived from converted carbon emissions. The funding is aimed at speeding up the adoption of advanced carbon management technologies, creating a market for environmentally sustainable alternatives in fuels, chemicals, and building products sourced from captured emissions from industrial and power generation facilities.

From *energy.gov*. July 2023.

Announced DOE Funding to Help Understand Impacts of Geologic Storage

DOE's Office of Fossil Energy and Carbon Management (FECM) and ***Office of Technology Transitions (OTT)*** announced funding for four national laboratory-led projects supporting carbon management and resource sustainability. One of the projects, led by Lawrence Berkeley National Laboratory, will develop a tool that will lead to a better understanding of the impacts of geologic carbon storage.

From *energy.gov*. July 2023.

NETL, Partners Develop Technology to Help Realize Effective Carbon Storage

NETL and partner organizations developed and demonstrated a suite of embedded sensor technologies enabled with sensing materials for subsurface wellbore integrity monitoring—technology that can help realize effective geologic carbon storage. Work began in April 2018, with NETL (project lead) and partner organizations including the Illinois State Geological Survey, Intelligent Optical Systems, University of California at Los Angeles, University of Pittsburgh, and Carnegie Mellon University.

From *NETL*. August 2023.

DOE Announces Intent to Launch Responsible Carbon Management Initiative

DOE's FECM ***announced its intent*** to launch a "Responsible Carbon Management Initiative," aimed at encouraging and recognizing project developers and others in the industry to pursue the highest levels of safety, environmental stewardship, accountability, community engagement, and societal benefits in carbon management projects.

From *energy.gov*. August 2023.

DOE Invests in Carbon Management Technologies and Applications

DOE's FECM announced funding for 23 projects to support R&D for carbon management technologies and applications that reduce carbon dioxide (CO_2) emissions. The projects will be led by universities and private sector companies throughout the United States to advance technologies toward commercial deployment that will capture CO_2 from sources such as industrial facilities or power plants, or directly from the air and oceans, and convert it into valuable products such as fuels, chemicals, and building materials.

From *energy*.gov. August 2023.

U.S., India Partnership to Collaborate on CCUS

During the third ministerial meeting of the U.S.-India Strategic Clean Energy Partnership (launched in September 2021), the sides renewed their commitment to work toward a just, orderly, and sustainable energy transition, prioritizing access to a reliable, affordable, and clean energy supply. In addition, the sides agreed to spur partnership in the area of carbon capture, utilization, and storage (CCUS).

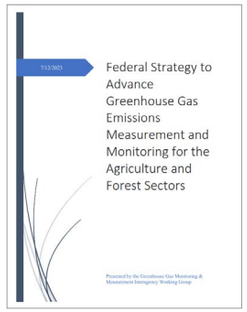
From *energy.gov*. August 2023.

ANNOUNCEMENTS *(cont.)*

USDA Announces Investments to Improve Monitoring of GHG Emissions and Carbon Storage

The U.S. Department of Agriculture (USDA) announced new investments to improve the measurement, monitoring, reporting, and verification of greenhouse gas (GHG) emissions and carbon storage in climate-smart agriculture and forestry. The investments, made possible by the Inflation Reduction Act (IRA), will advance priorities set by the broader ***Federal Strategy to Advance Greenhouse Gas Measurement and Monitoring for the Agriculture and Forest Sectors***, which was released as a draft for public input and outlines a strategic framework and priority actions for improving accuracy and reducing uncertainty of GHG estimates.

From *USDA*. July 2023.



MRCI 2023 Partners and Stakeholders Meeting

The DOE-funded ***Midwest Regional Carbon Initiative (MRCI)*** will hold its 2023 Partners and Stakeholders Meeting, October 3–5, 2023, in Morgantown, West Virginia. The meeting will include updates on the work MRCI has been doing to accelerate CCUS acceptance and deployment in its ***20-state region***, as well as updates from DOE, reports on commercial progress from the region, and an overview of research in the Illinois, Michigan, and Appalachian basins.

From *MRCI*. June 2023.

PROJECT AND BUSINESS DEVELOPMENTS

ExxonMobil Acquires CCS Solutions Company

ExxonMobil entered into a definitive agreement to acquire Denbury Inc.—a developer of CCS solutions and enhanced oil recovery. The acquisition provides ExxonMobil with a U.S. CO_2 pipeline network of 1,300 miles, as well as 10 strategically located onshore storage sites. In addition to Denbury's CCS assets, the acquisition includes Gulf Coast and Rocky Mountain oil and natural gas operations, which consist of proved reserves totaling more than 200 million barrels of oil equivalent, providing near-term optionality for CO_2 offtake and execution of the CCS business.

From *ExxonMobil*. July 2023.

Indiana Facility Receives Carbon Storage Injection Well Permits

The U.S. Environmental Protection Agency intends to issue two carbon storage injection well permits for Wabash Valley Resources' (WVR) planned ammonia production facility in Indiana. The WVR project, which has received funding from DOE's FECM to develop and validate technologies that enable cost-effective and safe geologic storage, will liquefy, inject, and store CO_2 in subsurface rock formations at depths of nearly a mile.

From *ICIS*. July 2023.

Occidental, ADNOC to Evaluate Carbon Management Projects

Occidental and ADNOC signed an MOU to evaluate investment opportunities in DAC infrastructure and CO_2 storage hubs in the United States and the United Arab Emirates (UAE). Under the terms of the MOU, ADNOC may evaluate participation in DAC plants and CO_2 storage hubs under development in the United States by Occidental subsidiary 1PointFive. Occidental and ADNOC may also evaluate jointly developing one or more UAE-located CO_2 storage hubs and consider beginning feasibility and pre-front-end engineering design studies for a 1 million metric ton/year DAC plant. The agreement is enabled by the ***UAE-US Partnership for Accelerating Clean Energy (PACE)***, which was launched in November 2022 and is expected to mobilize clean energy and carbon management projects, including CCS and DAC, by 2035.

From *Oil & Gas Journal*. August 2023.

MOU to Explore Integrated CCS Solutions

Fluor Corp. and Carbfix signed a memorandum of understanding (MOU) to pursue integrated CCS solutions. Under the MOU, the companies will look for ways to help decarbonize industries with high GHG emissions (i.e., steel, aluminum, and cement). In addition, the MOU also enables the two companies to pursue CO_2-removal projects such as DAC and bioenergy carbon capture and storage.

From *Chemical Engineering Online*. July 2023.

PROJECT AND BUSINESS DEVELOPMENTS *(cont.)*

Companies to Explore Integrated CCS Hub in Asia Pacific Region

A group of companies agreed to explore joint development of an integrated CCS effort in Malaysia for industries in the Asia-Pacific region. Petronas, TotalEnergies, and Mitsui & Co. will target all aspects of CCS development, including evaluating storage in maturing and depleted fields and in saline aquifers, as well as identifying potential customers and establishing the necessary commercial and legal frameworks.

From *Journal of Petroleum Technology*. July 2023.

Deals to Explore CCS, CCUS in Indonesia

Indonesia's state energy company PT Pertamina signed four agreements to study and explore potential developments of CCS and CCUS in Indonesia. Pertamina signed the agreements with Mubadala Energy, Japan Petroleum Exploration Co. Ltd, Japan Organization for Metals and Energy Security, and POSCO International. According to Pertamina, Indonesia has the potential to store up to 400 gigatonnes of CO_2 in its depleted oil and gas reservoirs and saline formations.

From *Reuters*. July 2023.

Companies Create Pact to Explore CCS Value Chain

Sharjah National Oil Corporation (SNOC) and Japan's Sumitomo Corporation signed an initial agreement to explore a carbon capture project in the Emirate of Sharjah, part of the United Arab Emirates. According to SNOC, the companies will conduct a feasibility study covering the entire CCS value chain, including transport, storage, business models, and assessment of regulatory aspects.

From *The National News*. July 2023.

UK Government Announces CCUS Cluster Selections

The United Kingdom (UK) government announced its selection for its next two CCUS clusters. The Acorn project is a CO_2 transportation and storage system that will reuse legacy oil and gas infrastructure to transport captured industrial CO_2 emissions from the Scottish cluster for storage under the North Sea. The Viking project has more than 300 million metric tons of initial storage capacity, with eight discrete reservoirs situated beneath the seabed. The clusters are slated for completion by 2030.

From *edie.net*. July 2023.

LEGISLATION AND POLICY

EU Awards Grants to Carbon Management Projects

The European Commission announced 41 projects that will receive grants as part of the latest call for funding for large-scale projects from the European Union (EU) Innovation Fund. A funding vehicle for the deployment of net-zero and carbon management technologies, the EU Innovation Fund is financed by proceeds from the EU Emissions Trading System. Of the 41 projects, 10 are in carbon management, covering topics such as CCS.

From *Carbon Herald*. July 2023.

Legislation to Catalyze Carbon Storage Introduced

Bipartisan legislation that will improve our understanding of soil carbon storage was introduced in the U.S. Senate. The ***Advancing Research on Agricultural Climate Impacts Act*** will catalyze soil carbon storage by directing the U.S. Department of Agriculture (USDA) to develop consistent and standardized soil carbon measurement methodologies; leverage the Agriculture and Food Research Initiative to develop new tools to measure, monitor, report, and verify GHG emissions and carbon storage; conduct farm demonstrations to improve producer understanding and adoption of soil carbon storage practices; establish a Soil Carbon Inventory and Analysis Network; and develop modeling tools that enable users to estimate changes in soil carbon and GHG emissions resulting from implementing conservation management practices.

From *U.S. Senator Tina Smith Press Release*. July 2023.

EMISSIONS TRADING

Qatar, Japan Agree to Study Carbon Credits

Qatar's Ministry of Environment and Climate Change and Japan's Mitsubishi Research Institute signed an agreement to conduct a study on carbon credits. The agreement will analyze Qatar's carbon credits plan, which pertains to initiatives and strategies aimed at reducing GHG emissions and promoting sustainable practices to combat climate change. The research project will enable Qatar to study possible climate change options, enhance current provisions on sustainability efforts, and achieve the goals of reducing emissions.

From *Arab News*. July 2023.

Companies Investing in Carbon Credits in Tanzania

Tanzania announced that it has attracted more than 20 companies to invest in carbon credits. The country introduced its first piece of legislation on carbon trading—the Environmental Management (Control and Management of Carbon Trading) Regulations—in October 2022. The legal framework issued in the country on carbon trading aims to provide for the control and management of carbon credits projects in Tanzania.

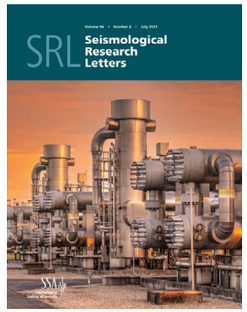
From Carbon Herald. July 2023.

SCIENCE

Fiber-Optic DAS Employed to Track CO_2 Injection

A ***study published in Seismological Research Letters*** highlights the pioneering use of fiber optic distributed acoustic sensing (DAS) by researchers at a field site in Victoria, Australia, for precise monitoring of induced seismicity resulting from a small-scale CO_2 injection. The CO2CRC Otway Project in Victoria serves as a research test site for exploring subsurface CO_2 storage.

From *Newswise*. July 2023.



Study Highlights CCUS Potential in the North Sea

A research study led by the University of Aberdeen identified areas of a North Sea gas "super basin" with the greatest potential for storing industrial carbon emissions. Scientists from the University's Center for Energy Transition used subsurface data and techniques usually employed in oil and gas exploration to produce a detailed technical study of the Anglo-Polish Super Basin in the Southern North Sea to determine its suitability for CCUS. Their results confirm the potential of the area as a future CCUS hub where industrial emissions can be stored in former gas fields and other geologic formations.

1495 UNIVERSITY OF ABERDEEN

From *phys.org*. July 2023.

About DOE'S CARBON TRANSPORT and STORAGE PROGRAM

The **Carbon Transport and Storage Program** at the National Energy Technology Laboratory (NETL) is focused on developing and advancing technologies to enable safe, cost-effective, permanent geologic storage of CO_2, both onshore and offshore, in different geologic settings. The technologies being developed will benefit both industrial and power sector facilities that will need to mitigate future CO_2 emissions. The program also serves to increase the understanding of the effectiveness of advanced technologies in different geologic reservoirs appropriate for CO_2 storage—including saline formations, oil reservoirs, natural gas reservoirs, unmineable coal seams, basalt formations, and organic-rich shale formations—and to improve the understanding of how CO_2 behaves in the subsurface. These objectives are necessary to increasing public confidence in safe, effective, and permanent geologic CO_2 storage.

The ***Carbon Transport and Storage Program Overview*** webpage provides detailed information of the program's structure, as well as links to the webpages that summarize the program's key elements.

Carbon Transport and Storage Program Resources

Newsletters, program fact sheets, best practices manuals, roadmaps, educational resources, presentations, and more information related to the Carbon Transport and Storage Program is available on ***DOE's Energy Data eXchange (EDX) website***.

Get Social with Us

There are several ways to join the conversation and connect with NETL's Carbon Transport and Storage Program:

Disclaimer

About NETL'S CARBON TRANSPORT and STORAGE NEWSLETTER

Compiled by the National Energy Technology Laboratory, this newsletter is a monthly summary of public and private sector carbon transport and storage news from around the world. The article titles are links to the full text for those who would like to read more (note that all links were active at the time of publication).

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