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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CARBON TRANSPORT and STORAGE PROGRAM DOCUMENTS and REFERENCE MATERIALS

- Carbon Transport and Storage Program Homepage
- Project Portfolio
- Publications
- Infographics
- Worldwide CCS Database
- Best Practice Manuals
- Conference Proceedings
- Fossil Energy and Carbon Management Techlines
- Frequently Asked Questions

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:

DOE/FECM/NETL HIGHLIGHTS

NETL Using BIL Funding to Accelerate Commercialization of CO_2 Storage Technologies.

Supported by funding from President Biden's Bipartisan Instructure Law (BIL), the National Energy Technology Laboratory's (NETL) development of computational models and software applications is poised to accelerate the commercialization of technologies to safely inject and store hundreds of years of carbon dioxide (CO_2) in the subsurface. Tools to receive BIL funding include the Energy Data eXchange for Carbon Capture and Sequestration (***EDX4CCS***) project, which provides an advanced, strategic, carbon capture and storage (CCS)-specific data infrastructure system to drive the efficient and rapid deployment of CCS efforts.

From *NETL*. June 2023.

CONTINUE

ANNOUNCEMENTS

2023 FECM/NETL Carbon Management Research Project Review Meeting.

The 2023 Office of Fossil Energy and Carbon Management (FECM)/NETL Carbon Management Research Project Review Meeting will take place August 28–September 1, 2023, in Pittsburgh, PA. The meeting will provide attendees the opportunity to share the knowledge and insights gained from more than 150 U.S. Department of Energy (DOE)-sponsored research and development (R&D) projects from the following FECM R&D programs: ***Point Source Carbon Capture***, ***Carbon Dioxide Removal (CDR)***, ***Carbon Conversion***, and ***Carbon Transport and Storage***. A mixture of plenary, multi-topic breakout, and interactive poster sessions will be delivered to share research results and provide opportunities for discussion and collaboration on the subject research efforts, both domestic and international. The meeting will be co-located with the U.S. Energy Association's inaugural ***Carbon Management Technology Showcase*** (CMTS). (Note: Registration for the CMTS is separate from the registration for the 2023 FECM/NETL Carbon Management Research Project Review Meeting.)

From *NETL*. July 2023

DOE/NETL Panel Discusses EDX disCO2ver.

NETL and DOE were represented on a panel called "***Bridging the Digital Divide with EDX disCO2ver.***" Held on July 20, 2023, by the non-profit American Council for Technology-Industry Advisory Council (ACT-IAC), the discussion focused on the purpose and future of ***EDX disCO2ver***, and why there is a need to provide a digital infrastructure to accelerate safe CCS practices.

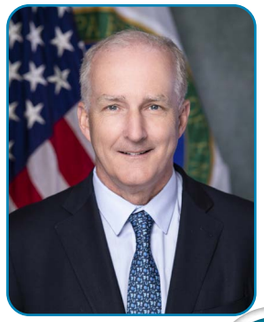
From *NETL*. July 2023

DOE Awards $3.9 Million to Advance High-Performance Computing for Energy Innovation.

DOE announced a $3.9 million federal investment for ***13 projects*** that will tap into the DOE National Laboratories' high-performance computing resources to connect with industry partners. These short-term, collaborative projects will address key manufacturing challenges and accelerate the development and deployment of clean energy technologies to advance the Biden-Harris administration's goal of net-zero carbon emissions by 2050.

From *energy.gov*. June 2023.

Senate Confirms DOE Under Secretary for Infrastructure.



David Crane was confirmed by the U.S. Senate to serve as Under Secretary for Infrastructure. The office focuses on deploying clean energy infrastructure and includes the Carbon Capture Demonstration Projects Program that targets demonstrating commercial-scale carbon capture technologies integrated with CO_2 transportation and geologic storage infrastructure.

From *energy.gov*. June 2023.

RGGI States Release Reports.

The states participating in the Regional Greenhouse Gas Initiative (RGGI) released two reports. The ***Report on the Secondary Market for RGGI CO_2 Allowances: First Quarter 2023***, prepared by Potomac Economics, contains information on future prices, market activity, and allowance holdings from January through March 2023. The RGGI states also ***released*** the ***Investment of RGGI Proceeds in 2021*** report, which tracks investments of RGGI proceeds in 2021, providing state-specific success stories and program highlights.

From *RGGI Press Release*. June 2023.

Merit Reviewers Needed.

The DOE Office of Clean Energy Demonstrations (OCED) is seeking independent merit reviewers with a range of skillsets and expertise to select projects for competitive funding opportunities. Visit the ***OCED Exchange*** and click "***Register***" to sign up.

From *OCED Updates*. June 2023.

2023 MRCI Stakeholders and Partners Meeting.

The 2023 Midwest Regional Carbon Initiative (MRCI) Stakeholder and Partners Meeting is scheduled for October 3–5, 2023, in Morgantown, WV. The DOE-funded MRCI will share the work it has been conducting to accelerate carbon capture, utilization, and storage (CCUS) acceptance and deployment in the Midwest, Northeast, and Mid-Atlantic regions of the United States.

Carbon Capture, CO_2 Removal to Play Key Decarbonization Role.

The Sustainability Research team of S&P Global Ratings reports that carbon capture and CO_2 removal will play a key decarbonization role. The credit ratings firm sampled 25 of the highest-revenue oil and gas companies and found that they all plan to use at least one of the options of CCS, CDR, or carbon credits to meet decarbonization goals.

From *Rigzone*. June 2023.

Offshore Carbon Storage Project in Danish North Sea Receives Safety Approval.

Project Greensand, an offshore carbon storage project in the Danish North Sea, received official safety approval from ***DNV***. The safety verification covers everything from fabrication by the individual subcontractors to the actual offshore installation. For this pilot project, the CO_2 was transferred from Belgium aboard a platform supply vessel, transferred to the Noble Resolve jack-up rig, injected into a depleted reservoir at the Nini field, and stored at a depth of about 1,800 meters below the seabed.

From *OE Offshore Engineer*. June 2023.

ANNOUNCEMENTS *(cont.)*

Report on Unforeseen Variances in Norway CCS Projects.

The Institute for Energy Economics and Financial Analysis (IEEFA) released a report on CO_2 storage in the Sleipner and Snøhvit subsea fields. "***Norway's Sleipner and Snøhvit CCS: Industry models or cautionary tales?***" focuses on subsurface geology and is based on literature reviews of technical studies and academic papers.

From *IEEFA*. June 2023.

The Institute for Energy Economics and Financial Analysis (IEEFA) has prepared a new report, "*Norway's Sleipner and Snøhvit CCS: Industry models or cautionary tales?*"

OMB Regulatory Agenda Outlines Upcoming CCS-Related Rulemakings.

The ***Spring 2023 Unified Agenda and Regulatory Plan***, published by the White House Office of Management and Budget, includes CCS-related items. Released twice per year, the agenda outlines actions federal agencies plan to issue in both the near and long term.

From *Ethanol Producer Magazine*. June 2023.

PROJECT AND BUSINESS DEVELOPMENTS

Sweetwater Carbon Storage Hub in Southwestern Wyoming.

The ***University of Wyoming's School of Energy Resources***, in partnership with Frontier Carbon Solutions Holdings, was selected to negotiate a ***Financial Assistance award by DOE's Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative*** to further develop the Sweetwater Carbon Storage (SCS) Hub. The SCS Hub spans more than 45,000 acres in southwestern Wyoming and will provide a carbon management solution for industrial emitters across the Mountain West. When fully developed, the SCS Hub is expected to store more than 350 million metric tons of CO_2 in geologic reservoirs.

From *PR Newswire*. June 2023.

Halliburton Wins Well Completions Contract for CCS Project.

Halliburton was awarded a contract to provide completions, liners, and monitoring solutions for the CCS system within the HyNet project. The ***HyNet North West*** project in Liverpool Bay in the UK will apply CCS to reduce carbon emissions by transporting CO_2 captured from industrial sources and storing it in depleted reservoirs underneath the bay.

From *BusinessWire*. June 2023.

Aalborg Portland and Fidelis New Energy Sign Letter of Intent.

Aalborg Portland, a Danish cement producer, signed a letter of intent with Fidelis New Energy to supply more than 400,000 metric tons of CO_2 to the ***Norne Carbon Storage Hub*** via pipeline by 2030. The Norne Carbon Storage Hub, a large-scale facility for handling captured CO_2, was announced by Fidelis in May 2023.

From *CemNet.com*. June 2023.

Japan's JOGMEC Selects Seven CCS Projects.

The Japan Organization for Metals and Energy Security (JOGMEC) selected seven projects to address business scale and cost reduction in CCS. The projects, from various industries including electric power generation, oil refining, and steelmaking, are expected to start operation by 2030 and capture and store approximately 13 million metric tons of CO_2 per year. Early in 2023, Japan's industry ministry set a target annual CO_2 storage capacity of 6–12 million metric tons by 2030 under a long-term roadmap for CCS.

From *Reuters*. June 2023.

Companies Sign MOU to Establish CCS Value Chain in Japan.

Japanese industries Japan Petroleum Exploration Co., JGC Holdings Corporation, Kawasaki Kisen Kaisha (K LINE), and JFE Steel Corporation signed a memorandum of understanding (MOU) to conduct a collaborative evaluation to establish a CCS value chain rooted in Japan. The evaluation includes CO_2 separation and capture at JFE's steelworks in Japan and marine transportation of liquefied CO_2 (LCO_2) to receiving point(s) in Malaysia. The valuation will also include an estimation of required facilities and costs.

From *Offshore Energy*. June 2023.

Partnership to Develop Floating Carbon Storage and Injection Unit.

Navigator Holdings, a specialist in liquefied natural gas carriers, and floating infrastructure operator Bumi Armada Berhad signed an MOU to develop a floating carbon storage and injection unit. The Bluestreak CO_2 joint venture aims to create a value chain of shuttle tankers that will transport captured CO_2 emissions to a floating storage and injection facility in the UK.

From *Carbon Herald*. June 2023.

PROJECT AND BUSINESS DEVELOPMENTS *(cont.)*

Mining Partnerships to Capture, Store CO_2.

Arca, a carbon mineralization company, is collaborating with several global nickel producers to use its technology to capture and store CO_2 in mine tailings. The technology accelerates the natural process of carbon mineralization, helping companies to utilize their mine waste to capture and store CO_2 directly from the air.

From *Sustainable Biz*. June 2023.

CO_2 Shipping and Storage Solution for Offshore Australia.

Australian oil and gas company Pilot Energy and Norway's Knutsen NYK Carbon Carriers will collaborate to develop an integrated solution for marine transportation and offshore injection of CO_2. The solution will utilize the Cliff Head CCS Project to enable large-scale industrial emitters to transport, via ship, ambient temperature LCO_2 for injection and offshore storage near the coast of Perth, Australia.

From *Marine Link*. June 2023.

LCO_2-Storage Vessels Receive Approval.

Vessel designs to carry and store LCO_2 have received approval in principle from the American Bureau of Shipping (ABS). Designs for the LCO_2 floating storage and offloading unit and the LCO_2 carrier were reviewed per the latest ABS Rules. ***ABS is a classification society for gas carriers***.

From *The Maritime Executive*. June 2023.

LEGISLATION AND POLICY

Carbon Offset Legislation Signed into Law in Alaska.

Carbon offset legislation giving the state authority to develop carbon management projects on state lands, sell carbon offset credits, and lease state lands for carbon management purposes was signed into law in Alaska. SB 48 is expected to generate new revenue for the state, enable more active forest management, and ensure public access and use of state lands. In addition to establishing the framework for carbon offset projects, the bill also gives the Alaska Oil and Gas Conservation Commission the authority to pursue primary authority over Class VI underground injection wells. (Class VI wells are used for geologic storage of CO_2.)

From *Office of Governor Mike Dunleavy*. May 2023.

EU Plans Strategy to Scale Up Investment in CCS.

In a public consultation, the European Commission announced plans to scale up its investment in capturing and storing CO_2 emissions. According to the Commission, infrastructure to capture and store CO_2 underground, or to use it in industry, was not developing fast enough. In an attempt to boost the industry, the Commission will produce a European Union (EU) strategy that could include 2040 and 2050 targets for CO_2 storage infrastructure, or EU-wide standards on CO_2 quality and access to carbon capture infrastructure.

From *Reuters*. June 2023.

Carbon Capture, Storage Bill Advances in Louisiana.

House Bill 571, which would give local lawmakers a percentage of the revenue from carbon stored under state land or water bottoms, was advanced by Louisiana lawmakers. Under the bill, 30% of revenues from carbon storage under state land or water bottoms would go to local governments. The bill now lies with Louisiana Gov. John Bel Edwards.

From *Iowa Capital Dispatch*. June 2023.

CCUS-Boosting Legislation Introduced.

The bipartisan Carbon Removal, Efficient Agencies, Technology Expertise (CREATE) Act was introduced in the U.S. Senate. The legislation would create a comprehensive federal initiative for CDR by creating a new interagency group on Large-Scale Carbon Management; establish four working groups within the Large-Scale Carbon Management interagency group to pursue a technological and detailed CDR research and demonstration initiative across several federal agencies; and require that the working groups focus on carbon removal in the oceans, atmosphere, and land using both natural and technological approaches.

From *U.S. Senate Committee on Environment and Public Works*. June 2023.

Pennsylvania Senate Committee Advances CCS Legislation.

The Pennsylvania Senate Environmental Resources and Energy Committee advanced two bills addressing CCS and reporting requirements. Senate Bill 831 would establish a legal and regulatory framework for potential CCS in Pennsylvania. Senate Bill 286 would direct the Environmental Quality Board to establish reporting obligations for accidental discharges or spills that could enter the water.

From *Pennsylvania Business Report*. June 2023.

EMISSIONS TRADING

RGGI States Announce Results of CO_2 Allowance Auction.

The RGGI states announced the results of their 60th auction of CO_2 allowances, during which 22,026,639 allowances were sold at a clearing price of $12.73. Auction 60 generated $280.4 million for states to reinvest in strategic programs, including energy efficiency, renewable energy, direct bill assistance, and greenhouse gas abatement. None of the 11.25 million cost containment reserve (CCR) allowances made available were sold (CCR allowances are made available for sale if an auction's interim clearing price exceeds a certain level [$14.88 in 2023]). In addition, none of the 10.62 million emissions containment reserve (ECR) allowances were withheld (ECR allowances are withheld if the auction's interim clearing price is below an established price level [$6.87 in 2023]). Additional details are available in the ***Market Monitor Report for Auction 60***.

From *RGGI Press Release*. June 2023.

Oklahoma to Start Issuing Carbon Storage Permits.

A bill signed by Governor Kevin Slitt is a step toward Oklahoma gaining delegation authority from the U.S. Environmental Protection Agency (EPA) over the permitting process for Class VI wells in the state. The wells are used by industry to inject captured carbon deep underground into rock formations for permanent storage. North Dakota and Wyoming are the only states with primacy for all well classes (I, II, III, IV, V, and VI). According to the news release, the legislation sets in motion a review of the Oklahoma Carbon Capture and Geologic Sequestration Act that was adopted in 2009.

From *Carbon Herald*. June 2023.

Marketplace for Carbon Credits Unveiled.

CarbonKerma launched a ***blockchain-based marketplace for carbon credits*** derived from the use of CCUS technology. The platform is designed to provide companies that capture carbon with an efficient means of selling carbon credits to companies and consumers seeking to offset their carbon footprints. The platform utilizes the immutability characteristics of blockchain technology to ensure the integrity and traceability of the carbon that is sunk, traded, and retired. Each sunk metric ton of CO_2 is represented as a digital token on a one-for-one basis.

From *Yahoo Finance*. June 2023.

Zimbabwe to Regulate Voluntary Carbon Offset Trading.

According to its environment minister, Zimbabwe's government will regulate voluntary carbon offset trading in a bid to curb greenwashing and ensure benefits for local communities. Zimbabwe says organizations operating carbon credit projects in the country were largely unregulated, meaning there is no reliable data on the size of Zimbabwe's carbon market.

From *Reuters*. May 2023.

Singapore, Mongolia to Collaborate on Carbon Credits.

The governments of Singapore and Mongolia signed an MOU to identify potential carbon projects that can yield carbon credits supporting the two countries' climate ambitions. The MOU will be implemented by an interagency working group between Singapore's Ministry of Sustainability and the Environment and Mongolia's Ministry of Environment.

From *The Business Times*. June 2023.

SCIENCE

Climate Change Releases Carbon Stocks Deep Underground: Study.

According to a study conducted by the University of Zurich's Department of Geography, in the Sierra Nevada National Forest, global warming could be accelerating the decomposition of soil humus and affecting the compounds that help plants store carbon, which were previously thought to be stable. According to the study, ***published in the journal Nature Geoscience***, the warming climate is causing the loss of organic compounds that help plants store carbon in their leaves and roots. Previously, scientists had assumed that complex polymers were able to withstand natural decomposition for longer and thus store carbon in the soil. However, the study found that the compound lignin—which gives plants their stiffness—was reduced by 17%, while waxy compounds called cutin and suberin—which protect plants from pathogens and are found in leaves, stems, and roots—were down 30%.

From *Phys.org*. June 2023.

Researcher Receives NSF Award to Study Carbon Storage.

An Indiana University researcher was awarded ***$736,000 from the National Science Foundation*** to address gaps in the understanding of CO_2-water-rock interactions that naturally remove CO_2 from the atmosphere. The research team is particularly interested in investigating basalt-CO_2-water interactions, which have shown potential for rapid, long-term carbon storage.

From *Newswise*. June 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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1450 Queen Avenue SW
Albany, OR 97321-2198
541-967-5892

3610 Collins Ferry Road
Morgantown, WV 26507-0880
304-285-4764

626 Cochran Mill Road
Pittsburgh, PA 15236-0940
412-386-4687

Program staff are also located in **Houston, Texas** and **Anchorage, Alaska**.

CUSTOMER SERVICE: 1-800-553-7681

www.netl.doe.gov

CONTACTS

If you have questions, feedback, or suggestions for NETL's Carbon Transport and Storage Newsletter, please contact:

Carbon Transport and Storage Newsletter Support at *CTSNFeedback@netl.doe.gov*

Mark McKoy
Technology Manager
Advanced Carbon Storage R&D
304-285-4426
Mark.McKoy@netl.doe.gov

William Aljoe
Technology Manager
Carbon Storage Infrastructure
412-386-6569
William.Aljoe@netl.doe.gov