



U.S. DEPARTMENT OF ENERGY



NATIONAL ENERGY TECHNOLOGY LABORATORY

# CTSN CARBON TRANSPORT and STORAGE NEWSLETTER

VOL. 24, NO. 4

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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 Funding to Advance CO<sub>2</sub> Capture and Storage, Conversion Technologies

The U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management (FECM) announced additional funding to support two carbon management priorities: the conversion of carbon dioxide (CO<sub>2</sub>) into environmentally responsible and economically valuable products and the development of lower-cost, highly efficient technologies to capture CO<sub>2</sub> from industrial sources and power plants for storage or conversion. Projects selected under **this funding opportunity announcement (FOA)** will focus on two areas: (1) technologies that utilize CO<sub>2</sub> from sources such as industrial and power generation facilities, as well as from legacy CO<sub>2</sub> emissions captured directly from the atmosphere, to produce value-added products while simultaneously reducing CO<sub>2</sub> emissions; and (2) lower-cost, highly efficient technologies for carbon capture from industrial facilities and power plants for secure geologic carbon storage or conversion into long-lasting products such as synthetic aggregates, building materials, and concrete. Responses are due April 29, 2024.

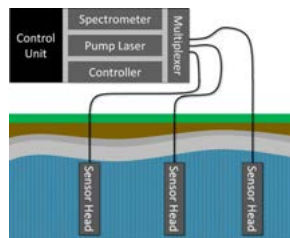
From [energy.gov](https://www.energy.gov). February 2024.

## ANNOUNCEMENTS

DOE Announces Intent to Launch Voluntary CO<sub>2</sub> Removal Purchasing Challenge

DOE-FECM issued a notice of intent (NOI) to launch a Voluntary Carbon Dioxide Removal Purchasing Challenge, which will call on external organizations to join DOE in purchasing high-quality CDR credits. This public-private partnership structure aims to catalyze CDR credit purchases and improve the transparency of the CDR credit supply. No new funding will be made available through this Challenge. DOE-FECM is seeking public input on how to structure the Challenge, as well as on interest in joining when it formally launches later this year. Interested parties may submit comments electronically to [VoluntaryCDRchallenge@hq.doe.gov](mailto:VoluntaryCDRchallenge@hq.doe.gov) and include "Voluntary CDR Purchasing Challenge" in the subject line no later than May 15, 2024. Responses must be provided as attachments to an email. Only electronic responses will be accepted.

From [energy.gov](https://www.energy.gov). March 2024

NETL Researchers Awarded Patent for Laser Technology That Detects CO<sub>2</sub> Emission Releases from Underground Storage Sites

National Energy Technology Laboratory (NETL) researchers were awarded a patent for improvements to laser technology that can be used to more efficiently detect potential release of CO<sub>2</sub> from underground carbon storage sites. The technology also holds potential for use as an online sensor in a range of other hostile environments that require environmental monitoring. The patent was the fifth in a series of technology patents that cover aspects of a laser-induced breakdown spectroscopy probe for underground storage site monitoring.

From [NETL](https://www.netl.doe.gov). February 2024.

DOE to Continue Investing in CO<sub>2</sub> FEED Studies

DOE-FECM intends to [reissue an FOA](#) that will provide Bipartisan Infrastructure Law (BIL) funding for front-end engineering design (FEED) studies that support and accelerate the planning for CO<sub>2</sub> transport from anthropogenic sources to CO<sub>2</sub> conversion or secure geologic storage locations. All modes of CO<sub>2</sub> transport (pipeline, truck, rail, barge, and ship), including any combination of transport modes, may be considered. Projects will accelerate the development of a large-scale carbon storage industry needed to achieve the Biden Administration's goals calling for net-zero carbon emissions in the power sector by 2035 and the broader economy by 2050. If released, a third closing date could be anticipated in the third quarter of fiscal year 2024.

From [NETL](https://www.netl.doe.gov). February 2024.

## NETL Launches EDX Spatial to Bring Energy Research Data and Interactive Maps to Decision Makers

NETL developed [EDX Spatial](#), the official geospatial visualization, exploration, and discovery tool of the Energy Data Exchange (EDX). Now available to the public, EDX Spatial offers access to thousands of individual spatial data layers, as well as collated [Data Collections](#) that align with DOE-FECM/NETL-funded research. The current inventory of EDX Spatial Data Collections includes the [Carbon Storage Open Database](#) and the [National Carbon Sequestration Database \(NATCARB\) Viewer 2.0](#).

From [NETL](https://www.netl.doe.gov). February 2024.



## DOE Announces Funding for Pilot-Scale Testing of Advanced CDR Technologies

DOE-FECM announced funding to help develop a commercially viable carbon dioxide removal (CDR) industry in the United States. The funding will support pilot projects and testing facilities to demonstrate and scale CDR technologies that reduce carbon dioxide (CO<sub>2</sub>) emissions by removing it directly from the atmosphere and then storing it in geologic, biobased, and ocean reservoirs, or converting it into value-added products.

From [energy.gov](https://www.energy.gov). February 2024.



## NETL Launches Class VI Data Support Tool Geodatabase

NETL has a [new video](#) describing its [Class VI Data Support Tool Geodatabase](#) that provides information needed to accelerate the completion of federal well construction permit applications to store CO<sub>2</sub> in the subsurface. The free and publicly available tool leverages data from the Carbon Storage Open Database, EDX, the U.S. Geological Survey, and other sources.

From [YouTube](https://www.youtube.com). February 2024.



## NETL's CCS Pipeline Route Planning Database Highlighted in Research Journal

NETL's Carbon Capture and Storage (CCS) Pipeline Route Planning Database was highlighted in the science journal [Data in Brief](#). The [paper](#) outlined details on individual data layers and methods used to identify data needs and planned upgrades for the next version of the database. The CCS Pipeline Route Planning Database is a one-stop-shop for U.S. geospatial data resources collected to help strategically plan safe and sustainable routes for the transportation of CO<sub>2</sub> from where it is captured to where it can be stored underground or converted into other products.

From [NETL](https://www.netl.doe.gov). February 2024.



## Carbon Capture Scotland Secures Milestone Storage Capacity

Carbon Capture Scotland, with German-based partner Landwärme, has secured 300,000 metric tons of CO<sub>2</sub> storage at the Stenlille project site in Denmark, anticipated to open in 2026. Carbon Capture Scotland operates an end-to-end carbon-removal offering, including capture, liquefaction, transport, and storage of biogenic CO<sub>2</sub>. Landwärme, a biomethane supplier, integrates carbon capture solutions with biomethane production.

From [Carbon Capture Scotland News Release](https://www.carboncapture.scot.nhs.uk). February 2024.



## ANNOUNCEMENTS *(cont.)*



### Partnerships to Drive Innovation in BECCS

Drax has joined Boeing as a founding member of the University of Sheffield's Energy Innovation Centre (EIC). The partnership is expected to drive research into next-generation carbon capture technology, including innovations in bioenergy with carbon capture and storage (BECCS). EIC offers industry partners access to two of its research facilities, including the Translational Energy Research Centre, which contains pilot-scale production facilities suitable for investigating different methods of carbon capture, utilization, and storage (CCUS).

From *Bioenergy Insight*. February 2024.

### Quality Scores Released for Forestry Carbon Credit Types



The Carbon Credit Quality Initiative (CCQI) released scores for two types of forestry carbon credits via detailed factsheets—**improved forest management** and **commercial afforestation**. According to CCQI, these project types comprise approximately 10% of recent credit issuances in the voluntary carbon market.

From *Carbon Credit Quality Initiative*. February 2024.

### Online Tool Estimates Carbon Storage in Oregon Coastal Habitats

Oregon's Coastal Management Program partnered with experts to develop a greenhouse gas (GHG) inventory that estimates carbon storage rates in coastal habitats, which are efficient at capturing and storing CO<sub>2</sub> from the air and surrounding waters.

From *Pew Charitable Trusts*. February 2024.

### NSTA Opens Consultation on Publicly Accessible Carbon Storage Data

The North Sea Transition Authority (NSTA), which regulates the United Kingdom's (UK) oil and gas, offshore hydrogen, and carbon storage sectors, opened a public consultation to determine what information about carbon storage data could be publicly disclosed. NSTA is seeking public views regarding proposals for a set of regulations relating to the public disclosure of carbon storage information and samples. The consultation will be open until April 12, 2024.

From *Carbon Herald*. February 2024.



### Southeast Asia Carbon Storage Study Released

Technology company CGG released a Southeast Asia Carbon Storage Study to support and accelerate the screening process for all players in the region's CCUS market. The study ranks and prioritizes large-scale opportunities across 58 basins in Indonesia, Malaysia, Thailand, and Vietnam to help streamline the process of identifying the best basins and plays for potential carbon storage.

From *CGG Press Release*. February 2024.

### RGGI Secondary Market Report Available



The independent market monitor for the Regional Greenhouse Gas Initiative (RGGI) market released the **Report on the Secondary Market for RGGI CO<sub>2</sub> Allowances: Fourth Quarter 2023**. Prepared by Potomac Economics, the report contains information on the secondary market for RGGI CO<sub>2</sub> allowances, including futures prices, market activity, and allowance holdings.

From *RGGI*. February 2024.

### Webinar on CCS Developments in the US

The *Carbon Capture Journal* recorded a webinar reviewing CCS projects in the United States. Speakers included Tracy Evans, CEO of *CapturePoint*, and John Thompson, Technology and Markets Director at the *Clean Air Task Force*.

From *Carbon Capture Journal*. February 2024.

### Capture Carbon, Capture Value: An Overview of CCS Business Models

The Oxford Institute for Energy Studies released a **paper** identifying the main commercial and non-commercial risks associated with CCS. The paper also analyzes incentive mechanisms, regulatory and legal frameworks, types of industry and ownership structures, and public-private partnerships that are likely to emerge in different parts of the world to mitigate these risks and enable viable business models to scale up the technology.

From *The Oxford Institute for Energy Studies*. February 2024.



## PROJECT AND BUSINESS DEVELOPMENTS



### EnLink, ExxonMobil Collaborate on CCS

EnLink Midstream and ExxonMobil are collaborating to explore CCS opportunities along the Gulf Coast. The initiative aims to extend beyond the southeast Louisiana Mississippi River Corridor and into several other areas, addressing one of the highest concentrations of industrial CO<sub>2</sub> emissions in the United States. According to U.S. Environmental Protection Agency findings, the Gulf Coast region generates more than 215 million metric tons of CO<sub>2</sub> per year.

From *Offshore Technology*. February 2024.



### Seatrium Secures Full-Scale CCS Retrofit

Seatrium—a Singapore-based shipbuilding group—secured a turnkey CCS retrofit contract from Norwegian shipowner Solvang ASA. The initiative involves the retrofitting of a 7-megawatt (MW) Wärtsilä CCS system onto Solvang's ethylene carrier, the Clipper Eris. The system is expected to capture 70% of CO<sub>2</sub> emissions from the main engine by using amine cleaning technology. The project will involve the entire value chain for handling CO<sub>2</sub>, including liquefaction and storage onboard the vessel.

From *Offshore Energy*. February 2024.

### Singapore, Indonesia to Collaborate on CCS

Singapore and Indonesia signed a letter of intent to collaborate on cross-border CCS, with work underway for a legally binding agreement to enable the transport and storage of CO<sub>2</sub> between both countries. Earlier this year, Indonesia issued a presidential regulation to allow CCS operators to set aside 30% of their storage capacity for imported CO<sub>2</sub>. Singapore aims to achieve net zero by 2050 through low-carbon technological pathways like hydrogen and CCS.

From *S&P Global*. February 2024.

### Planning Documents Filed for CCS Project

Planning documents were filed for a gas turbine and CCS project in Stallingborough, close to the South Humber Bank Power Station in Lincolnshire, England. The proposed development is expected to consist of one combined cycle gas turbine plant. Carbon emissions from burning gas will be captured, compressed, and transported via pipeline for storage beneath the seabed.

From *BBC.com*. February 2024.

### Companies Agree to Subsurface CO<sub>2</sub> Storage Exploration



Weyerhaeuser

Weyerhaeuser and Lapis Energy signed a two-year exploration agreement for subsurface CO<sub>2</sub> storage in Arkansas, Louisiana, and Mississippi. The agreement covers 187,500 acres and spans five potential storage sites, including two that were previously identified by Weyerhaeuser as prospective opportunities for CCS development. Under the agreement, Lapis will determine the storage potential of each site; upon successful completion of the technical and commercial assessments, Lapis will have the option to move sites into full-scale development agreements and complete the work required to permit, build, and operate permanent CO<sub>2</sub> storage sites serving large-scale industrial sources.

From *PR Newswire*. February 2024.

### Funding Secured for CCS Project in South Australia

Santos has secured funding for their share of the Moomba CCS project in South Australia. The project, the first phase of which is 80% complete, will have the capacity to store up to 1.7 million metric tons of CO<sub>2</sub> per year (with actual volumes depending on the availability of CO<sub>2</sub> for storage). Santos has also recently signed a

series of agreements with international third parties to evaluate the potential to capture, transport, and store their emissions at Moomba.

From *Santos News Release*. February 2024.

## LEGISLATION AND POLICY



### Germany Plans to Enable Underground Storage of CO<sub>2</sub> at Offshore Sites

According to government officials, Germany plans to enable underground carbon storage at offshore sites. The proposed "Carbon Management Strategy," which has not yet been developed into detailed legislation, foresees enabling the transport of CO<sub>2</sub> and its storage under the sea in Germany's exclusive economic zone, except in marine conservation areas. The country aims to reduce its emissions to net zero by 2045.

From *The Associated Press*. February 2024.



### Announcement of Acreage for CO<sub>2</sub> Storage on Norwegian Continental Shelf

The Norwegian Ministry of Energy announced two areas in the North Sea for applications related to CO<sub>2</sub> injection and storage on the Norwegian continental shelf. Awards in such areas are a prerequisite for large-scale CCS. The application deadline is April 24, 2024.

From *Norwegian Ministry of Energy Press Release*. March 2024.



## EMISSIONS TRADING

### Red Trail Energy Issues Carbon Removal Credits

North Dakota-based Red Trail Energy (RTE) and Pure.earth announced that RTE has produced CO<sub>2</sub> Removal Certificates in the voluntary carbon market. The CO<sub>2</sub> removal credits are generated through BECCS from ethanol production and comply with Puro's geologically stored carbon methodology. The **RTE project** was supported by DOE/NETL through its cooperative agreements with the University of North Dakota Energy and Environmental Research Center.



Image Credit: Red Trail Energy

From Gasworld. March 2024.

### Germany to Launch CBAM Awareness Campaign

German emissions trading authority Dehst is launching an awareness campaign on compliance with the European Union's (EU) carbon border adjustment mechanism (CBAM), as many companies did not register or submit the mandatory report at the end of the first reporting phase. The EU's CBAM aims to prevent companies from relocating to other jurisdictions to avoid carbon costs in sectors covered by the bloc's emissions trading system and is initially being applied to cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen. Reporting obligations began with the launch of the transition period on October 1, 2023, while the levy on imports will be phased in from the start of 2026.

From *Argus Media*. February 2024.

## SCIENCE

### Study: Improved Rangeland Grazing Management Could Boost Carbon Storage

A study found that improved grazing practices implemented at the scale of traditional pastoralist migrations can remove a significant volume of GHGs from the atmosphere and store in soil carbon. The study, conducted by a team of scientists from various universities and organizations in the United States, Kenya, and Tanzania, was performed across more than five million acres of rangeland in Northern Kenya. According to the **study findings**, the statistically significant magnitude of increase in soil carbon associated with conducting high-density, short-duration grazing practices was slightly higher than that predicted by a relatively simple model that links soil carbon changes to grazing management. Calculations from this long-term study suggest that improved grazing practices, implemented at a large scale, have removed millions of metric tons of CO<sub>2</sub> from the atmosphere and support the issuance of carbon credits to the **Northern Kenya Rangelands Carbon Project**.

From Newswise. February 2024.

### Anoxic Marine Basins Viable Carbon Storage Candidates: Study

Research led by UC Santa Barbara suggests that anoxic marine basins may be among the most viable places to conduct large-scale carbon storage in the deep ocean while minimizing negative impacts on marine life. Anoxic marine basins are deep and largely isolated from the main, oxygen-supplying currents. They cannot support animal life and are populated primarily by microbes and fungi with metabolisms different from those of creatures in oxygen-rich environments. Combined, these conditions are ideal for the preservation of plant matter. The study's results are **published in the journal AGU Advances**.

From *Phys.org*. February 2024.

### Washington State Passes Legislation to Link Carbon Markets with California, Quebec

The Washington State Senate passed legislation aimed at bolstering efforts to integrate its cap-and-invest carbon market with those of California and Quebec. **Senate Bill 6058** introduces a series of technical adjustments to the carbon markets, facilitating better alignment with the respective systems.

From *Carbon Herald*. February 2024.

### EU Reaches Deal on Carbon Removal Certification Scheme



The European Parliament and the Council of EU member states reached a deal on a proposal to set up a registry for certified CDRs obtained from eco-farming practices and industrial processes. The tentative agreement aims to scale up high-quality carbon removal in the EU to reach the EU's objective of reducing emissions to net zero by 2050.

From *Euractiv*. February 2024.

### Carbon Capture Method Powered by Geothermal Energy Could Help Store CO<sub>2</sub>

According to a study conducted by researchers from Ohio State University, by combining direct air CO<sub>2</sub> capture technologies (DACC) and geothermal energy, large-scale CO<sub>2</sub> removal systems could potentially generate enough energy to remove CO<sub>2</sub> from the atmosphere and store it underground. Traditional DACC methods require a significant amount of energy, which can contribute to GHG emissions. The new approach, called direct air CO<sub>2</sub> capture with CO<sub>2</sub> utilization and storage, aims to integrate recycled CO<sub>2</sub> into the system to make it more efficient. The researchers' findings were **published in Environmental Research Letters**.

From *Tech Explorist*. February 2024.

 **THE OHIO STATE UNIVERSITY**



## 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<sub>2</sub>, 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<sub>2</sub> emissions. The program also serves to increase the understanding of the effectiveness of advanced technologies in different geologic reservoirs appropriate for CO<sub>2</sub> 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<sub>2</sub> behaves in the subsurface. These objectives are necessary to increasing public confidence in safe, effective, and permanent geologic CO<sub>2</sub> 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

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## 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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