



U.S. DEPARTMENT OF
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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 Funding to Support CO₂ Transport and Storage

The U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management (FECM) announced federal funding for projects that will help advance commercial-scale carbon capture, transport, and storage throughout the United States to reduce carbon dioxide (CO₂) emissions from industrial operations and power plants as well as legacy emissions in the atmosphere. Specifically, the funding will provide technical, informational, and educational assistance to stakeholders involved in DOE and private sector-based carbon transport and storage projects located throughout the nation, as well as to communities impacted by these projects. The application deadline for this **funding opportunity announcement (FOA)** is January 30, 2024.

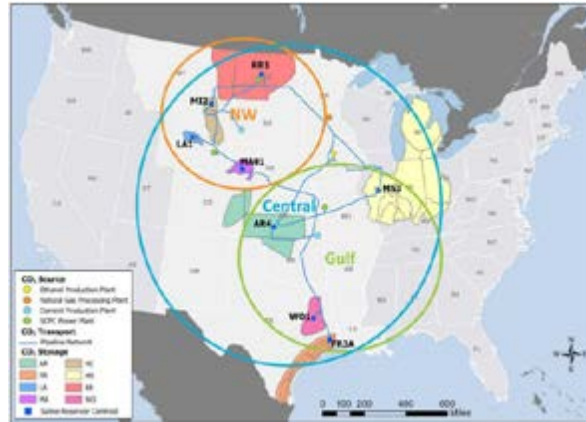
From *energy.gov*. December 2023.

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



NETL Research Suggests Tailored, Regional Approach for CCS

National Energy Technology Laboratory (NETL) researchers explored variables associated with transporting and storing CO₂ in **the Central United States**. Dividing the region into three impact areas, they found that geographic differences had significant impacts on costs and provided a framework to evaluate them. In the research, each impact area provided the means to design a carbon capture and storage (CCS) network that could connect different source types at hypothetical locations with geologic storage reservoirs through either a (1) dedicated pipeline connecting a single source to a single storage reservoir site or (2) trunkline network consisting of pipeline segments and hubs connecting multiple sources to multiple storage reservoir sites. The analysis resulted in the evaluation of more than 100 integrated source-to-sink matching scenarios, and the results highlighted the significance of the location and type of the CO₂ source, capture rate of a CO₂ source, quality of the saline storage reservoir, and distance between source and sink on overall costs. A [poster](#) and [presentation](#) on this topic are also available.



From NETL. December 2023.

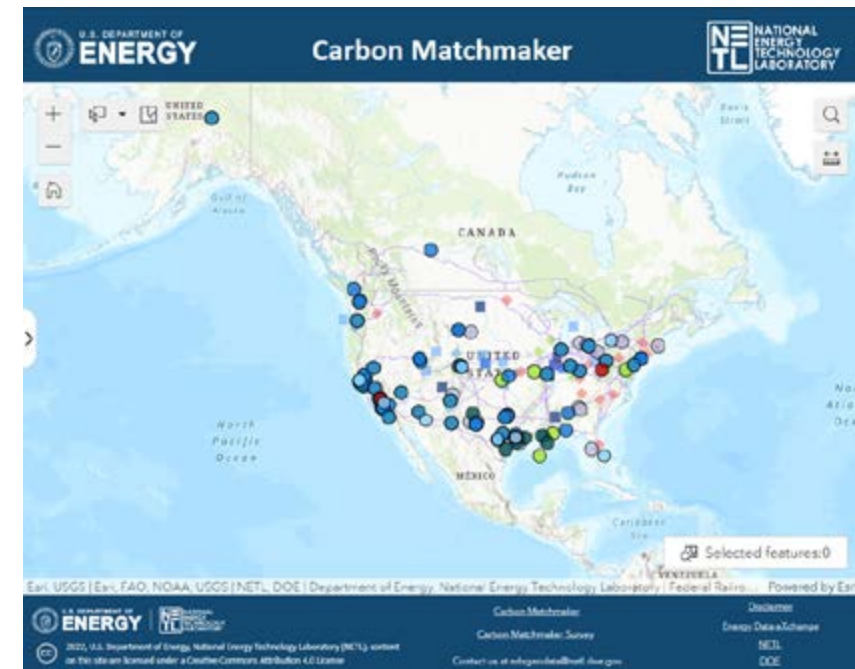
DOE Re-Opens Funding Opportunity to Expand National CO₂ Storage Infrastructure

DOE-FECM announced the third opening of a five-year **funding opportunity** available through President Biden's **Investing in America agenda** to support the transport and storage of CO₂ captured from industrial and power generation facilities, as well as from legacy CO₂ emissions removed directly from the atmosphere. Projects selected under the Bipartisan Infrastructure Law's (BIL) Storage Validation and Testing Program will develop new and expanded carbon storage projects through FECM's **Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative**, each with the capacity to store 50 or more million metric tons of CO₂ over a 30-year period. Multiple openings of this FOA allow for the continuous development of commercial-scale carbon storage infrastructure, with projects focusing on feasibility determination, detailed site characterization, planning, permitting, and construction stages of project development.

From [energy.gov](#). December 2023.

NETL Online Information Hub Connects CCUS Community

Developed by NETL researchers in coordination with DOE-FECM, **Carbon Matchmaker**, an online information hub, connects users across the carbon capture, utilization, and storage (CCUS) community and carbon dioxide removal (CDR) supply chains, helping to achieve net-zero greenhouse gas (GHG) emissions through strong public-private partnerships in a just and sustainable way. Carbon Matchmaker aligns with goals and initiatives included in the BIL, which directs more than \$12 billion for carbon management research, development, and demonstration over five years. Organizations across the CCUS and CDR supply chains (i.e., providers of services, materials, equipment and tools) interested in being included, may do so, via the **Carbon Matchmaker Self-Identification Form**. From NETL. November 2023.



Since its launch in July 2022, Carbon Matchmaker has reviewed and approved significant amounts of data, integrating it into an interactive web map so those using the tool can locate resources and form teams to address carbon management issues in their regions.

ANNOUNCEMENTS



Proposed Rule to Allow CCS Projects in National Forests



The U.S. Forest Service is working toward allowing CCS projects on national forest land according to a [proposed rule published by the agency](#). The rule would amend existing Forest Service regulations by allowing “exclusive and perpetual use” of national forest land and pore space beneath it for approved CCS projects.

From *Reuters*. November 2023.

Fifth National Climate Assessment Report Released

The U.S. Global Change Research Program released the [Fifth National Climate Assessment](#) report, which demonstrates how climate change is affecting America’s working lands, how communities are reducing their risks, and how solutions to climate change can be found in productive landscapes. Mandated by the Global Change Research Act of 1990 and produced approximately every four years, the report provides authoritative scientific information about climate change risks, impacts, and responses in the United States.

From *U.S. Department of Agriculture*. November 2023.



2023 Global Status of CCS Report



The latest edition of the Global CCS Institute’s CCS report found that as of July 31, 2023, there are 41 commercial-scale CCS facilities in operation, 26 facilities in construction, and 325 in various stages of development. The [Global Status of CCS Report 2023](#) also found that between 2022 and 2023, 11 new countries registered CCS facilities in various stages of development.

From *Carbon Capture Journal*. November 2023.

IEA CCUS Handbook on CCUS Policies and Business Models

The latest International Energy Agency (IEA) CCUS Handbook, [CCUS Policies and Business Models: Building a Commercial Market](#), provides governments with a policy toolkit to address challenges to CCUS deployment. It also provides an overview of existing policies that have helped launch CCUS projects to date, identifies the main challenges to future large-scale deployment, and highlights international best practices. The handbook is supported by IEA’s [CCUS Projects Database](#) and complements the IEA CCUS Handbooks on [Legal and Regulatory Frameworks for CCUS](#) and [CO₂ Storage Resources and Their Development](#).

From *IEA*. November 2023.



DOE’s Carbon Management Day Webinar

DOE-FECM celebrated its third annual Carbon Management Day on December 1, 2023. The [webinar](#) provided the latest news and announcements on DOE carbon management initiatives, featured a fireside chat with DOE carbon management leaders, and informed stakeholders on how they can get involved.

From *energy.com*. December 2023.

UK Forum Commissions Projects to Test, Demonstrate Offshore Wind and CCS

The Crown Estate’s Offshore Wind and CCS Colocation Forum commissioned two research projects designed to inform the best approach to test and demonstrate the colocation of offshore wind and CCS activities in the future. The research projects—Project Colocate and Project Anemone—build on the forum’s [Spatial Characterisation Report](#), which identified areas of potential overlap for offshore wind and CCS on the seabed, and the [North Sea Transition Authority’s Seismic Imaging Report](#), which explored various options for monitoring carbon storage and offshore wind sites to help resolve possible colocation issues.

From *The Crown Estate*. November 2023.

EU Announces Funding for Decarbonization Projects

The European Commission announced funding for projects developing technologies that help reduce GHG emissions as well as projects expanding the production of clean power components. The call is from the Innovation Fund, which is funded by the European Union’s (EU) Emissions Trading System (ETS).

From *Rigzone*. November 2023.

Carbon Storage Hub Declared Project of Common Interest

The European Commission announced the selection of the [Norne Carbon Storage Hub](#) as a Project of Common Interest to promote the storage of European CO₂ emissions in Denmark. Launched by Fidelis New Energy in 2021, Project Norne was designed to be a large-scale, vertically integrated onshore CO₂ transportation and storage network in Denmark, supporting decarbonization efforts across Europe.

From *PR Newswire*. November 2023.



Report Outlines North Sea’s Carbon Storage Potential

According to a report by Xodus and Subsea7, approximately 100 reservoirs will need to be prepared in the North Sea to satisfy the UK government’s climate ambitions by 2050. Over the next decade, the report predicts that up to 100% of Europe’s CCUS projects will be focused on the North Sea.

From *Offshore Magazine*. November 2023.

ANNOUNCEMENTS *(cont.)*Sri Lanka Plans CO₂ Storage

To achieve carbon neutral status by 2050, Sri Lanka's cabinet of ministers approved a [roadmap and strategic plan](#), which has identified measures to reduce GHG emissions and increase carbon storage.

From *Economy Next*. November 2023.

Companies Agree to Employ Concrete CO₂ Storage Technology

Deloitte and CarbonCure have agreed to utilize concrete CO₂ storage technology. Under the agreement, Deloitte will purchase [high-quality carbon credits](#) to directly support the deployment of [CarbonCure's carbon removal technologies](#) worldwide.

From *Carbon Herald*. November 2023.

Application for CCS Onshore CO₂ Transportation Pipeline Accepted

The UK Planning Inspectorate accepted for examination Harbour Energy's application to build the [Viking CCS onshore CO₂ transportation pipeline](#). The onshore pipeline will transport captured CO₂ from the Immingham industrial area to the former Theddlethorpe Gas Terminal site on the Lincolnshire coast. From Theddlethorpe, the CO₂ will be transported to the depleted Viking gas fields for storage beneath the seabed.

From *Carbon Capture Journal*. November 2023.

PROJECT AND BUSINESS DEVELOPMENTS



DAC Facility Opens in California

Heirloom Carbon Technologies unveiled a direct air capture (DAC) facility in California that has the potential to capture up to 1,000 tons (~907 metric tons) of CO₂ per year for eventual storage. The facility has been operational for nearly 1,000 hours and has been actively capturing atmospheric CO₂, which will be stored in concrete through a [partnership with CarbonCure Technologies](#).

From *Heirloom Carbon News Release*. November 2023.



Injection Begins at Texas CCS Project

Energy companies BKV and EnLink Midstream announced that a CO₂ injection at a CCS facility in Texas was completed ahead of schedule. The [Barnett Zero CCS facility](#), to be used as a prototype for future projects, is expected to achieve an average storage rate of up to 210,000 metric tons of CO₂ equivalent per year. EnLink will transport natural gas produced by BKV in the Barnett shale in North Texas to its Bridgeport processing plant, where CO₂ will be compressed and stored underground in a nearby well.

From *Reuters*. November 2023.

Research Funding Awarded to UK CCS Projects



The UK Carbon Capture and Storage Research Community Network+ (UKCCSRC) awarded funding to 13 projects, several of which focus on the knowledge and technical developments required for CO₂ storage. The funding comes from the UKCCSRC's [Flexible Funding 2023](#) call and support from the UK's Engineering and Physical Sciences Research Council.

From *Carbon Capture Journal*. November 2023.

Companies Partner on BECCS Project

Evero Energy Group Limited and Mitsubishi Heavy Industries are partnering on Evero's [Ince Bioenergy with Carbon Capture and Storage \(InBECCS\)](#) project, which is expected to be operational in 2029. The InBECCS project will be retrofitted on Evero's Ince Bio Power site, a waste wood-to-energy facility located in the northwest of England, close to the Hynet industrial cluster. The project is expected to generate up to 250,000 metric tons of engineered carbon removals per year.

From *Mitsubishi Heavy Industries Press Release*. November 2023.

Indonesia, US to Explore CCS Investment

Indonesia's state energy company Pertamina and U.S. oil company Exxon Mobil agreed to carry out further evaluations for investments in CCS facilities using two underground basins in the Java Sea. According to a statement by Pertamina, the CCS hub with Exxon has the potential to store at least 3 gigatonnes of CO₂ released by industries in Indonesia and the rest of the region.

From *Reuters*. November 2023.

Partnership to Store CO₂ in Louisiana

CapturePoint LLC announced a partnership with Southwestern Energy Company to dedicate CO₂ from its Haynesville natural gas processing plant for storage in the [Central Louisiana Regional Carbon Storage Hub \(CENLA Hub\)](#). The initiative aims to store captured CO₂ underground in suitable geologic formations in Rapides and Vernon Parishes.

From *businesswire*. November 2023.

PROJECT AND BUSINESS DEVELOPMENTS *(cont.)*

Companies to Collaborate on Cross-Border CCS

Santos and Korean energy company SK E&S **signed a memorandum of understanding (MOU)** to collaborate on carbon solutions. Under the MOU, the companies will develop a low-carbon hub in Darwin in the Northern Territory (following a CO₂ storage permit award). Santos and SK E&S will also collaborate on securing additional CO₂ storage, including the Bayu-Undan field, and develop a transboundary business model to aggregate and transport CO₂ from Korea to Australia for underground storage.

From *Carbon Capture Journal*. November 2023.



Additional CCS Acreage Secured in Australia

Santos and joint venture partner Beach Energy secured additional carbon storage acreage in Australia by being awarded a Gas Storage Retention license southwest of Moomba. Under the license, the joint venture is authorized to carry out activities to establish the nature and extent of natural reservoirs, test the reservoirs for storage of CO₂, and establish the commercial feasibility of CO₂ storage and storage techniques. The license area is near Santos' Moomba CCS project, which is on track for startup in 2024 and is expected to store up to 1.7 million metric tons of CO₂ per year.

From *World Oil*. November 2023.

CO₂ From Dutch Plant to be Stored Under Norway Seabed

Yara, a fertilizer company, signed a binding agreement to capture CO₂ emissions from its Dutch ammonia plant and transport it to the Norwegian North Sea for storage beneath the seabed. The CO₂ will be liquefied and shipped from the Sluiskil plant by Northern Lights, TotalEnergies, and Shell. The CCS plant will begin operations in 2025 with the potential to reduce CO₂ emissions by 800,000 metric tons over 15 years. According to the company, the project is expected to be one of the first that transports CO₂ from one nation and across borders for storage by another.

From *Reuters*. November 2023.

Japanese, Malaysian Companies to Develop CCS Project

Japanese companies have agreed to develop a CCS project with Malaysian energy firm Petronas by the end of 2028. Japan Petroleum Exploration Company is developing the CCS project with JGC Holdings Corp and K Line, as well as state-controlled Petronas. The companies plan to start the front-end engineering design in 2024 with the goal of injecting and storing CO₂ from Japan and Malaysia in depleted oil and gas fields off the Malaysian coast.

From *Reuters*. November 2023.

LEGISLATION AND POLICY



Introduced Legislation to Coordinate Federal Soil Carbon Storage Efforts

The U.S. House of Representatives introduced bipartisan legislation to empower the federal government to support interagency work around soil carbon storage research and monitoring. The ***Coordination for Soil Carbon Research and Monitoring Act*** (1) establishes an Interagency Committee on Soil Carbon Research led by the White House Office of Science and Technology Policy; (2) directs the committee to develop a cross-agency strategic plan for federal research, development, and deployment regarding soil carbon storage sampling and measurement methodologies, measurement and monitoring technologies, and community needs; (3) establishes working groups to coordinate soil carbon research priorities; and (4) requires regular reporting to Congress on soil carbon storage research and monitoring activities.

From *Congresswoman Jennifer McClellan Press Release*. November 2023.

U.S., China to Collaborate on Large-Scale CCUS

The United States and China will each advance at least five large-scale cooperative CCUS projects by 2030, according to a statement jointly released by both governments. Among other announcements, the ***Sunnylands Statement on Enhancing Cooperation to Address the Climate Crisis*** also stated that the two countries will operationalize the Working Group on Enhancing Climate Action in the 2020s to engage in dialogue and cooperation.

From *S&P Global*. November 2023.

Parliament of Australia Passes Law Enabling Offshore CO₂ Storage

The Parliament of Australia passed amendments to the legislation required to aid injection and transportation of CO₂ in Australian waters. The amendments to Environment Protection (Sea Dumping) Act 1981 ensure compliance with London Protocol obligations, enabling permits for offshore CO₂ capture, transportation, and storage in Australian waters.

From *Gas World*. November 2023.

LEGISLATION AND POLICY *(cont.)*

EU Governments to Auction 244 Million Carbon Permits

European governments will auction 244 million EU carbon permits from January to August 2024 under the EU ETS, the European Commission announced. The EU ETS requires manufacturers, power companies, and airlines to pay for each metric ton of CO₂ they release as part of Europe's efforts to meet its climate targets. The number of permits member states will sell from September to December 2024 will be published on July 31, 2024, the Commission said.

From *Reuters*. November 2023.



EU Approves Climate Policies



The European Parliament approved the Carbon Removal Certification Framework (CRCF) and the Net-Zero Industry Act (NZIA) in support of scaling up CDR capacity in the EU. Regarding the CRCF, four distinct types of certified units were introduced: carbon removal, carbon storage in products, carbon farming storage, and carbon farming emissions reduction. Regarding the NZIA, carbon removal was added to the list of net-zero technologies supported by the act, and CO₂ capture, infrastructure, and storage projects are now recognized as "Net-Zero Strategic Projects."

From *Carbon Herald*. November 2023.

EMISSIONS TRADING



China Issues Guidance for Restart of Domestic Voluntary Carbon Market

China's Ministry of Ecology and Environment (MEE) issued guidance for the development and implementation of projects in the domestic voluntary carbon market. The domestic voluntary carbon market, known as China Certified Emission Reduction (CCER), has been paused since 2017 for new project registrations as the government called for an enhancement of the regulatory framework. In early 2023, MEE released new legislation and approved methodologies for CCER credit issuance, paving the way for the market to onboard new projects and new supplies.

From *S&P Global*. November 2023.

Government of India Proposes Procedure for Carbon Credits Trading

The Government of India's Bureau of Energy Efficiency issued a draft Detailed Procedure for Compliance Mechanism under the Carbon Credit Trading Program. Under the procedure, the Ministry of Environment, Forest, and Climate will announce GHG emission intensity targets for tons of CO₂e per unit of equivalent product for each defined trajectory cycle applicable to obligated entities. The obligated entities will be informed of an annual target for three years; upon conclusion of this period, the targets will undergo revision.

From *Mercom India*. November 2023.

Japan Approves Projects Under Domestic Offset Scheme

Japan approved 26 projects with the potential to generate approximately 3.1 million carbon credits over their lifetimes. The projects were approved under the **J-Credit scheme**, which is designed to certify the amount of GHG emissions reduced and removed by sinks within Japan.

From *Carbon Pulse*. November 2023. (Subscription may be required.)

RGGI Secondary Market Report Available

The states participating in the Regional Greenhouse Gas Initiative (RGGI) released the **Report on the Secondary Market for RGGI CO₂ Allowances: Third Quarter 2023**. Prepared by independent market monitor Potomac Economics, the report is based on data reported to the U.S. Commodity Futures Trading Commission, the Intercontinental Exchange, and the Nodal Exchange, as well as other data.

From *RGGI*. November 2023.



SCIENCE



Study Focuses on Carbon Storage Potential

Research led by the Crowther Lab at ETH Zürich and co-authored by more than 200 scientists throughout the world found that forests have the potential to store up to 226 billion metric tons of carbon if protected and restored. Published in the journal *Nature*, the study found that approximately 61% of this potential is attainable by protecting existing forests and allowing them to reach old-growth maturity. The remainder requires restoring degraded and deforested areas and connecting forest fragments in key areas.

From *Mongabay*. November 2023.



Study: Reservoir Construction May Reduce Carbon Storage in Ocean Sediments

Research published in the journal *Frontiers in Marine Science* calculated carbon storage in the western Pacific Ocean since 1855, noting the negative impact of reservoir construction on carbon stocks. The researchers measured total organic carbon in the South Yellow Sea and East China Sea and found a noticeable trend in declining total organic carbon content from north to south through the study area, matching the increase in sediment grain size. They also found a noticeable decline in carbon reservoir stocks since the early 1990s, following the construction of reservoirs in the Ou River basin in 1988 and 1989, whose courses terminate in the sampled seas.

From *Phys.Org*. November 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 CO₂, 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 CO₂ emissions. The program also serves to increase the understanding of the effectiveness of advanced technologies in different geologic reservoirs appropriate for CO₂ 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 CO₂ behaves in the subsurface. These objectives are necessary to increasing public confidence in safe, effective, and permanent geologic CO₂ 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:



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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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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