



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 funding to strengthen nation's infrastructure for CO₂ storage

The U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management (FECM) announced funding to support 23 selected projects across 19 states that will develop the infrastructure needed for national decarbonization. The projects, funded by the Bipartisan Infrastructure Law (BIL), will provide for the development and validation of commercial large-scale carbon storage infrastructure to significantly and responsibly reduce carbon dioxide (CO₂) emissions from industrial operations and power plants, as well as from legacy emissions in the atmosphere, while supporting good jobs and environmental priorities in local communities. All projects will support the **Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative**, managed by FECM, and focus on the detailed site characterization, planning, permitting and construction stages of project development under CarbonSAFE. DOE is also seeking information from stakeholders on carbon storage infrastructure needs prior to opening the next round of this funding opportunity.

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

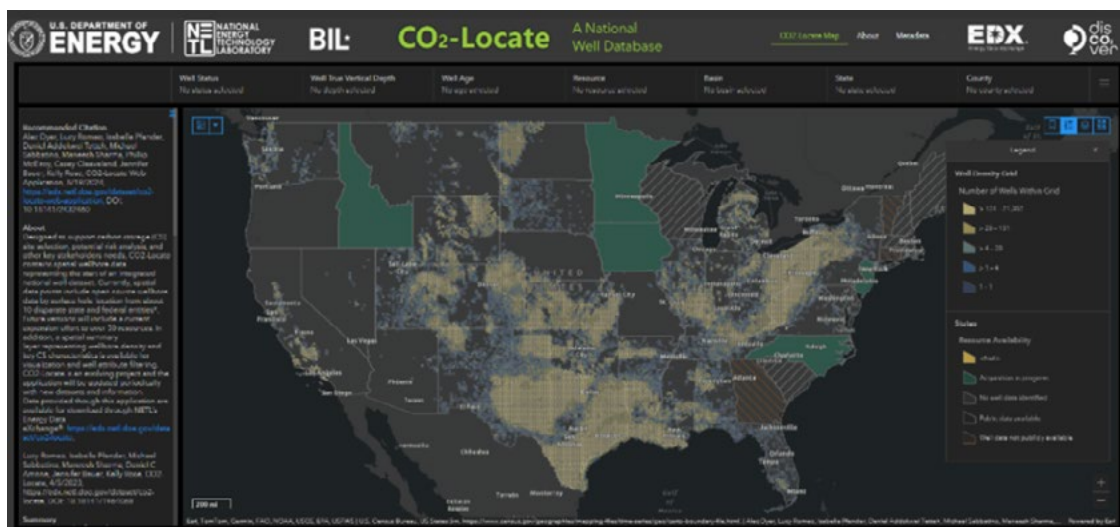


ANNOUNCEMENTS

NETL launches web application making data accessible for permitting and risk assessment of carbon storage

The National Energy Technology Laboratory's (NETL) new **CO₂-Locate** web application, available on NETL's Energy Data eXchange (EDX)[®], offers decision-makers access to information needed to help create a net-zero carbon emissions power sector. The CO₂-Locate Database is an integrated national dataset representing open-source wellbore data from state and federal entities that was designed to provide interactive access to information for project managers, researchers, industry professionals, the public and other stakeholders. It makes data publicly accessible for users to gain insights that can help reduce risk and uncertainty, streamline processes, and reduce costs. The CO₂-Locate web application helps users review specific areas for injection, evaluate potential for monitoring wells, support risk assessments, and analyze environmental and social justice metrics to help transition toward a sustainable future.

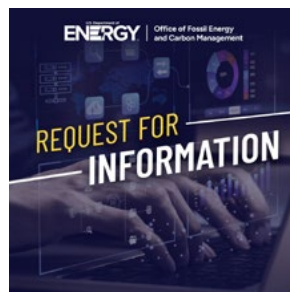
From *energy.gov*. October 2024.



DOE FECM seeks stakeholder input on carbon storage infrastructure needs

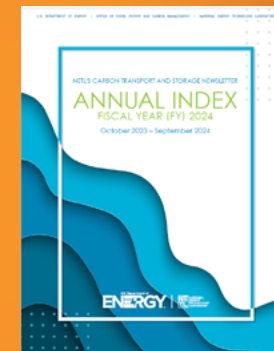
DOE-FECM released a **request for information (RFI)** seeking input from stakeholders, prior to its next round of funding, on carbon storage infrastructure needs. The goal of the RFI is to gain perspective on what aspects of the **CarbonSAFE initiative**, including its objectives, have been the most successful and what can be improved in achieving the program's vision of "support(ing) rapid deployment of carbon storage necessary to enable the decarbonization of the U.S. economy." The submission deadline is December 20, 2024.

From *FECM*. October 2024.



FY 2024 Carbon Transport and Storage Newsletter Annual Index Available

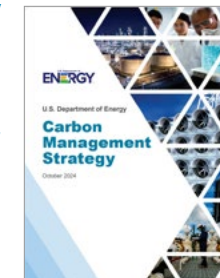
The FY 2024 Carbon Transport and Storage Newsletter Annual Index is available. The document is a compilation of NETL's Carbon Transport and Storage Newsletters published from October 2023 through September 2024.



DOE accepting public comments on Carbon Management Strategy

DOE is soliciting public comments on its Carbon Management Strategy, which provides a comprehensive roadmap for the remainder of the decade that outlines the diverse tools and approaches DOE will use to develop and deploy carbon management solutions in line with the administration's climate, economic and social priorities. **DOE's Carbon Management Strategy** is focused on near-term actions that can position carbon management to scale as needed in subsequent decades. Comments must be submitted electronically to carbonmanagementstrategy@hq.doe.gov by December 10, 2024.

From *energy.gov*. October 2024.



DOE announces Tribal Fossil Energy and Carbon Management Working Group

DOE announced the formation of the Tribal Fossil Energy and Carbon Management Working Group — a collaboration with tribal leaders to reduce greenhouse gas (GHG) emissions and strengthen national security. Administered by DOE-FECM, the working group will explore technical assistance and capacity-building to leverage funding opportunities related to FECM's portfolio and other DOE offices, including the development of carbon capture, transport and storage facilities.

From *energy.gov*. November 2024.

DOE/OCED seeks public input on approaches to catalyze DAC technology commercialization

DOE's Office of Clean Energy Demonstrations (OCED) issued an **RFI** to obtain public input regarding additional approaches that current and future DOE programs could implement to help direct air capture (DAC) technology developers address challenges in raising project investment capital and achieving sustained facility operations. This RFI will help inform the **Regional DAC Hubs program**, which supports an ecosystem of projects that aim to remove legacy CO₂ from the atmosphere and accelerate efforts to meet the administration's clean energy and climate goals.

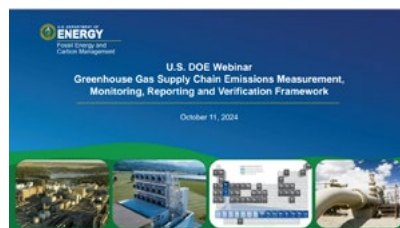
From *OCED*. October 2024.



ANNOUNCEMENTS *(cont.)***DOE-FECM hosts webinar on GHG MMRV Framework**

In partnership with the U.S. Energy Association, DOE-FECM hosted a webinar on the **Greenhouse Gas Supply Chain Emissions Measurement, Monitoring, Reporting and Verification (MMRV) Framework**. FECM Assistant Secretary Brad Crabtree and other DOE officials discussed DOE's international collaboration to advance the Greenhouse Gas Supply Chain Emissions MMRV and shared recent updates and progress in furthering these efforts and provided stakeholders an opportunity to provide additional feedback. Slides from the webinar are available [here](#).

From [energy.gov](#). October 2024.

**DOE funding for CDR supports storage**

DOE-FECM, with DOE's Hydrogen Fuel Cell Technologies Office, announced federal funding for **11 projects** to help develop a commercially viable carbon dioxide removal (CDR) industry in the United States. Several of the projects support small-scale biomass carbon removal and storage technology.

From [energy.gov](#). October 2024.

EPA releases 2023 data collected under GHG Reporting Program

The U.S. Environmental Protection Agency (EPA) released 2023 GHG data collected under its **Greenhouse Gas Reporting Program**. In 2023, reported direct emissions of GHGs from large stationary sources, representing approximately 50% of total U.S. emissions, were down by approximately 4% from 2022. From 2011 to 2023, total reported GHG emissions from large facilities decreased by approximately 22%, driven by a decrease in power plant emissions.

From [EPA News Release](#). October 2024.

Verra releases modules for CCS

Verra released three modules intended for use under the methodology **"VM0049 Carbon Capture and Storage (CCS)"** in the Verified Carbon Standard Program. These modules enable projects to quantify the CO₂ removals resulting from direct air capture projects. With the publication of the modules, Verra's CCS methodology is now operational and can be used by projects to deliver real, additional and high-

integrity emission removals globally.

From [Verra](#). October 2024.

New CO₂ measurement solution aims to bring transparency to CCUS projects

Measurement technology company Vaisala launched a product that measures CO₂ and humidity and is specifically designed to bring transparency to carbon capture, utilization and storage (CCUS) projects. **MPG241** measures CO₂ and humidity in point source and DAC processes, as well as in different CCUS projects. According to Vaisala, MPG241 requires no calibration gases, needs less maintenance and has a 10+ year lifespan in heavy-duty use.

From [Carbon Capture Journal](#). October 2024.

Report on BECCS

IDRIC released a **report** outlining key discussions and recommendations from a December 2023 workshop held in London on the potential of bioenergy with carbon capture (BECCS) to support the UK's commitment to achieve its net-zero emissions target by 2050. Attendees at the workshop emphasized that trust, demand and collaboration are critical components in the successful integration of BECCS into the UK's energy strategy.

From [Carbon Capture Journal](#). October 2024.

**CarbonCure achieves carbon storage milestone**

CarbonCure Technologies — a climate tech company deploying its carbon utilization solution across the global cement and concrete industry — announced it has saved more than 500,000 metric tons of CO₂ to date across 7.5 million truckloads of CarbonCure concrete. CarbonCure injects captured

CO₂ into fresh concrete where it immediately mineralizes and is stored, enabling producers to use less cement while maintaining their concrete's compressive strength.

From [Carbon Herald](#). October 2024.

CCS projects see growth in 2024

Industrial CCS projects have been experiencing rapid growth since 2017, with the total number of projects reaching 628 worldwide in 2024, according to a **report** published by the Global CCS Institute. As of July 24, 2024, among these projects, 50 were operational, 44 were under construction and 534 were in development, marking a 60% increase over the past year.

From [energynews](#). October 2024.





PROJECT AND BUSINESS DEVELOPMENTS

Exxon Mobil expands potential carbon storage area



Exxon Mobil acquired state leases for more than 271,000 acres in Texas state waters for an offshore CO₂ capture operation. The lease with the Texas General Land Office follows Exxon's 2021 bid for federal land off the Texas coast for CO₂ capture, and its emergence as a high bidder on 69 blocks in the shallow waters of the U.S. Gulf of Mexico in 2023 to further expand its potential carbon storage area.

From *Reuters*. October 2024.

Japanese companies team up for CCS project

Japan Petroleum Exploration Co., Idemitsu Kosan Co. and Hokkaido Electric Power Co. have teamed up to develop a CCS facility located in the Tomakomai area on Japan's northern island of Hokkaido. The three companies aim to launch the project, which will have a capacity of 1.5 million to 2 million metric tons of CO₂ per year, in 2030.

From *Reuters*. October 2024.

Partnership to accelerate CCUS projects

Consulting and engineering firm Wood is leading a joint industry partnership (JIP) to accelerate CCUS projects through the creation of **Industry Guidelines for Setting the CO₂ Specifications in CCUS Chains**. The purpose of the JIP is to collate industry research and the experience of operators currently operating in the CCUS arena to determine the effects of impure CO₂ in existing carbon capture chains.

From *Offshore Energy*. October 2024.



Partnership advancing CCS project in offshore Coastal Bend region



The Aves CCS joint venture partnership is working on an innovative project to capture and store CO₂ emissions from the Coastal Bend industrial region approximately 1.5 miles beneath the seabed in the Gulf of Mexico. The carbon storage hub project is located in close proximity to more than 35 million

metric tons per year of existing industrial emissions, with more than 20 million metric tons per year of greenfield project emissions anticipated in the same area by 2035. The Aves CCS joint venture partnership — comprised of Repsol as the operator, Carbonvert and Mitsui — brings together their collective experience across oil and gas, CCS, industrial, and renewable projects in the United States and internationally.

From *Carbonvert Press Release*. October 2024.

Dairy cooperative launches carbon storage project

FrieslandCampina — a Dutch multinational dairy cooperative — launched a 10-year project to store CO₂ in grassland in the Netherlands. The collaboration with dairy farmers, who together manage 780 hectares (1,927 acres) of permanent grassland, is expected to result in the storage of 1,755 metric tons of CO₂ per year. Recently approved by the **National Carbon Market Foundation**, the project is aimed at carbon storage in permanent grassland on mineral agricultural soils.

From *FrieslandCampina*. October 2024.



Collaboration looks to accelerate CCUS technology

Indonesian state-owned energy company PT Pertamina is collaborating with the JOGMEC and JAPEX energy companies to develop and accelerate the application of CCUS technology in Pertamina's oil and gas fields. The project involves injecting 100 tons of CO₂ per day over a 25-day period using specially designed equipment. The CO₂ is injected in a liquid or gas state at well pressures of 1,000 to 1,500 pounds per square inch (psi), and this represents the second phase of a pilot test following the initial "huff and puff" method conducted in late 2023. After the second phase, Pertamina plans to evaluate oil production levels and, if successful, expand the full implementation of CCUS technology with CO₂-enhanced oil recovery at Sukowati and other oil fields.

From *Indonesia Business Post*. October 2024.

CCS project in South Australia fully operational

Australian oil and gas producer Santos announced that its **Moomba CCS project** in the Cooper Basin is fully operational, injecting CO₂ into depleted oil and gas reservoirs at a full rate. The project is expected to store 250,000 metric tons of CO₂ by year's end, with plans to increase injection capacity to 1.7 million metric tons of CO₂

per year over the next year, as the supply of emissions allows. The CCS facility located in South Australia's desert outback features a four-stage compressor, five injection wells, CO₂ dehydration units and pipelines; CO₂ from the Moomba gas plant is injected into depleted underground reservoirs in the Strzelecki and Marabooka fields.

From *Journal of Petroleum Technology*. October 2024.



PROJECT AND BUSINESS DEVELOPMENTS *(cont.)*



Japan-Australia CCS value chain to be studied

INPEX

Japanese exploration and production company INPEX and Japanese electric utilities provider Chubu Electric Power will conduct a joint study to assess the feasibility of establishing a CCS value chain involving the capture of CO₂ in Japan and its transportation from the Port of Nagoya in Aichi Prefecture to Australia for

storage. INPEX was awarded a **GHG storage assessment permit** in the Bonaparte Basin off the northwestern coast of the Northern Territory of Australia with TotalEnergies CCS Australia and Woodside Energy in 2022. This project aims to begin CO₂ injection around 2030 and could represent a key component of the Darwin-based CCUS Hub1 proposed by the Northern Territory Government.

From *MarketScreener*. October 2024.

California CCS project receives approval

Kern County (California) approved plans for California Resources Corporation's (CRC) **Carbon TerraVault I (CTV I) CCS project**. Located at CRC's Elk Hills Field in Kern County, CTV I's storage reservoir has a total estimated storage capacity of up to 46 million metric tons of CO₂. Once operational, the CTV I project is expected to be capable of injecting and storing more than 1 million metric tons of CO₂ per year.

From *California Resources Corporation*. October 2024.



Consortium creates value chain for CO₂ storage in concrete

A consortium of companies has joined forces to demonstrate the feasibility of the entire CO₂ removal value chain, from carbon capture and liquefaction to transport and, finally, end use in concrete manufacturing. The CO₂ is supplied by ARC, a Danish waste-to-energy plant capable of capturing up to 4 metric tons of CO₂ daily directly from flue gas. The CO₂ removals are sold to Swiss outdoor clothing and climbing gear brand **Mammut** via a carbon removal marketplace operated by Danish startup Klimate, and Belgian logistics company Bofort is responsible for safely transporting the liquefied CO₂ before it is mineralized by the Finnish Carbonaide.

From *Carbon Capture Journal*. October 2024.

Network of CO₂ pipelines to be developed in southeast Texas



Enterprise Products Partners will develop a new CO₂ pipeline network in southeast Texas to support Occidental's **Bluebonnet Sequestration Hub**. According to Occidental's 1PointFive CCS company, the pipeline network will "transport CO₂ emissions captured by third parties at facilities in the vicinity of the Houston Ship Channel." The CO₂ pipelines will be "co-located" with existing infrastructure and will send CO₂ to the Bluebonnet Sequestration Hub, which was recently awarded DOE funding.

From *S&P Global*. October 2024.

BECCS plant launched

Swedish company Nordbex announced the launch of its BECCS plant in Nybro, Sweden. The project has an energy production capacity of 135 gigawatt hours and a carbon capture capacity of 200,000 tons per year. This is the first of five facilities already in the pipeline for Nordbex, which has come up with a practical approach to potentially scaling BECCS by mixing innovative approaches with the capabilities of existing infrastructure.

From *Carbon Herald*. October 2024.



Partnership advancing plans to establish CCS hub in China's Guangdong province

Shell and Exxon Mobil, in partnership with China National Offshore Oil Corporation, are advancing plans to establish a **CCS hub in southern China's Guangdong province**, specifically in the Daya Bay area. The consortium, along with the local Guangdong government, has completed the preliminary front-end engineering design study for the first phase of the CCS project, targeting the capture and storage of 2 million metric tons of CO₂ per year.

From *Upstream*. October 2024.

LEGISLATION AND POLICY



Denmark funds to support CCS

The government of Denmark announced funds to support the development of CCS initiatives. The third of its kind in a series of government-released funding opportunities directed toward the advancement of CCS projects, the **funds are provided by the Danish Energy Agency** and are currently in the tendering process where interested parties can apply and submit offers. The selected projects will receive the funding over a 15-year period, and the funding will go toward the capture, transportation and geologic storage of carbon that is biogenic, atmospheric or comes from fossil-based sources. The subsidies come with the requirement that capture facilities must be commissioned by December 1, 2029, and active capture and storage operations must begin in 2030.

From *Carbon Herald*. October 2024.



Danish Energy Agency

Singapore EMA issues grant call to study site-specific CCS

Singapore's Energy Market Authority (EMA) issued a grant call to select power generation companies and industry partners to co-fund and look into site-specific CCS feasibility studies for the power sector. The grant call will study post-combustion carbon capture for combined-cycle gas turbines, as well as precombustion carbon capture to produce hydrogen for power generation. Through the grant call, EMA and the power generation companies can deepen their understanding of power sector CCS pathways. According to EMA, the technology, if proven, will enable Singapore to use its existing natural gas infrastructure to achieve its decarbonization goals.

From *Asian Power*. October 2024.



EU drafting proposal to revise climate law



The European Union (EU) started the process of establishing the bloc's post-2030 climate policy framework. After launching a public consultation in June 2023, the European Commission published a communication on the 2040 target, accompanied by an impact assessment, in February 2024. The communication is the first step toward a legislative proposal in 2025 that will

amend the **European Climate Law**, and to subsequent proposals that will operationalize the 2040 target within key EU climate policies in 2026.

From *Carbon Market Watch*. October 2024.

Brazil passes CCS legislation

Brazil passed **new legislation** that focuses on regulating and inspecting activities involving the capture, transport and geologic storage of CO₂. Under the new framework, **Brazil's National Agency of Petroleum, Gas and Biofuels** will oversee CCS operations, issuing regulatory standards and granting authorization. The law also imposes several obligations on CCS operators, such as identifying and addressing emergencies, maintaining records on permanent carbon storage, and conducting inventories to monitor CO₂ storage and leakage.

From *Carbon Herald*. October 2024.

Oregon approves plan to dedicate state forest to carbon storage and crediting

The **Oregon State Land Board** approved a proposed forest management plan to dedicate the **Elliot State Forest** to storing CO₂ while generating revenue from selling carbon credits. The plan – which prioritizes research, protecting animal habitat and increasing forest carbon storage – includes registering all 83,000 acres of the Elliott in the voluntary carbon crediting market to generate millions of dollars for the state.

From *Oregon Capital Chronicle*. October 2024.



EU Innovation Fund supports CCS projects

The European Commission selected 85 net-zero projects located in 18 countries to receive grants from the **Innovation Fund**. The selected projects, which cover a wide range of sectors, are set to enter into operation before 2030 and, over their first 10 years of operation, are expected to reduce emissions by approximately 476 million metric tons of CO₂ equivalent.

From *European Commission*. October 2024.

Canada proposes to back CCS project



Canada's federal financing agency **Canada Growth Fund** has proposed funding support for **Pathways Alliance's investment in a CCS project** aimed at reducing carbon emissions from oil sands. **Pathways Alliance** – made up of Canadian Natural Resources, Cenovus, ConocoPhillips Canada, Imperial, MEG Energy and Suncor Energy – represents approximately 95% of Canada's oil sands production, according to its website.

From *Reuters*. October 2024.

EMISSIONS TRADING



US nature-based carbon credit auction set for 2025

The American Forest Foundation (AFF) announced it will hold an auction for carbon credits for its [Family Forest Carbon Program](#) in February 2025. The [AFF Carbon Auction](#) will offer buyers a transparent and streamlined means of securing high-quality carbon credits while supporting rural communities and family forest owners.



From *Sustainable Brands*. October 2024.

Carbon credit portfolio rating framework launches

Carbon ratings agency BeZero Carbon launched a carbon credit portfolio rating framework that assesses the likelihood that a given basket of carbon credits achieves one metric ton of CO₂ equivalent reduced or removed for each portfolio credit issued. The BeZero Carbon Portfolio Rating enables buyers to make credible, risk-adjusted claims using a composition of carbon credits.



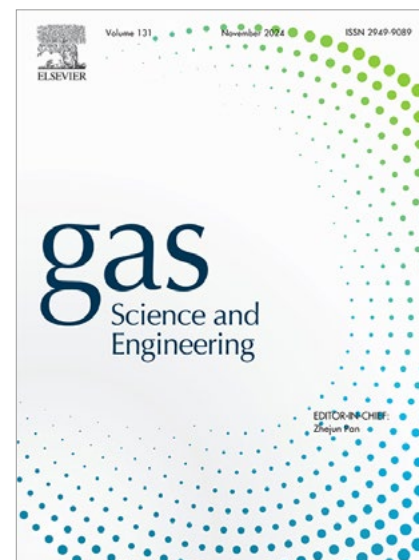
From *Carbon Herald*. October 2024.

SCIENCE

Evaluation of pressure interference from CO₂ injection from multiple projects located in close proximity

Large-scale decarbonization via CCS includes injection of large volumes of CO₂ from many projects that will elevate reservoir pressures and may lead to rapid convergence of fracture pressure thresholds and/or affect areas of review. [Strategic Systems Analysis and Engineering](#) researchers at NETL published a manuscript, titled "[Dynamic modeling studies of basin-scale pressure interference and CO₂ plume evolution in multi-well geologic CO₂ storage](#)," which involved numerical modeling to analyze how CO₂ plumes and pressure fronts evolve when CO₂ is injected into a single storage formation from multiple projects located in proximity. Results draw attention to the importance of future coordination among storage operators and regulatory stakeholders in regions where extensive CCUS development is expected to occur.

From *Gas Science and Engineering*. October 2024

Stacked CO₂ injection evaluated as strategy to mitigate pressure buildup from multiple projects occurring in close proximity

Multiple CO₂ storage projects planning to operate in close proximity could raise concerns associated with extensive reservoir pressure buildup and pressure interference. Researchers from NETL's [Strategic Systems Analysis and Engineering](#) team published "[Basin-scale study of CO₂ storage in stacked sequence of geological formations](#)," which quantitatively evaluates the benefits of mitigating the extent of pressure build up using stacked injection versus injecting into a single formation while still achieving the same or greater target CO₂ storage volumes.

From *Scientific Reports*. August 2024



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