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

VOL. 22, NO. 12

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

DOE Accepting Letters of Interest for Loans Under CO_2 Transportation Infrastructure Finance and Innovation Program.

The U.S. Department of Energy (DOE) is accepting Letters of Interest from applicants for loans under a $2.1 billion Carbon Dioxide Transportation Infrastructure Finance and Innovation (CIFIA) Program. Enacted under the Bipartisan Infrastructure Law (BIL), CIFIA offers funding for large-capacity, shared carbon dioxide (CO_2) transportation projects located in the United States. Appropriated annually through 2026, CIFIA will support shared infrastructure projects that connect anthropogenic sources of carbon with endpoints for its storage or utilization. The program is administered jointly by DOE's Loan Programs Office (LPO) and the Office of Fossil Energy and Carbon Management (FECM). Additional details on eligibility, priority considerations, and financial terms and conditions are available on the ***CIFIA website***.

From *energy.gov*. October 2022.

CONTINUE

ANNOUNCEMENTS

FY 2022 Carbon Transport and Storage Newsletter Annual Index Available.

The National Energy Technology Laboratory's (NETL) FY 2022 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 2021 through September 2022.

Company Offers Corrosion Testing for CCS Developments.

Welltec opened a new test flow loop facility in Esjerg, Denmark, that will provide corrosion testing for carbon capture and storage (CCS) developments. The center is expected to replicate extreme environmental conditions, ensuring materials planned for storing CO_2 in a subsurface reservoir provide the necessary levels of durability and wear resistance.

Carbon Storage Evaluation Agreement Reached.

TC Energy and Pembina Pipeline entered into a carbon storage evaluation agreement with the Government of Alberta to further evaluate an Area of Interest for storing carbon from industrial emissions in Alberta (Canada). The agreement will allow the Alberta Carbon Grid to move into the next phase of the province's carbon capture, utilization, and storage (CCUS) process.

Report: CCS Capacity Rises.

The capture capacity of CCS projects in the project pipeline has risen from 169 million metric tons per year in 2021 to 244 million metric tons per year currently, according to the Global CCS Institute. In addition, the ***Global Status of CCS 2022*** report also found that the U.S. legislation ***Inflation Reduction Act (IRA)*** could increase the deployment of CCS 13-fold by 2030 compared to existing policy.

RGGI Auction 58.

The states participating in the Regional Greenhouse Gas Initiative (RGGI) plan to host their 58th quarterly auction of CO_2 allowances on December 7, 2022. Auction 58 will offer allocation year 2021 and 2022 CO_2 allowances (initial offering) and allow for activation of an Emissions Containment Reserve (ECR) or a Cost Containment Reserve (CCR). The CCR contains several CO_2 allowances, in addition to the initial offering, that will be offered for sale when the interim clearing price exceeds a threshold. The ECR represents several CO_2 allowances that will be withheld from the initial offering when the interim clearing price falls below a threshold.

Increase in EOR Creating Demand for CO_2 Market.

A report published by the market research company Maximize Market Research shows that increasing utilization of CO_2 for enhanced oil recovery (EOR) has created a demand for the CO_2 market. Maximize Market Research's "Carbon Dioxide Market 2022" found that the global CO_2 market size is expected to reach ~$12 billion by 2029, at a compound annual growth rate of ~4.8%.

Scaled-Up Technology Addresses CCUS Economics.

Schlumberger and RTI International entered into an agreement to accelerate the industrialization and scale-up of RTI's non-aqueous solvent technology, which addresses the efficiency of absorption-based carbon capture and the overall economics of CCUS projects, according to the company.

PROJECT AND BUSINESS DEVELOPMENTS

CCS Project to Be Developed in Nebraska.

Carbon America and Bridgeport Ethanol LLC agreed to develop a CCS project at the Bridgeport Ethanol facility in Nebraska (USA). Carbon America will install carbon capture equipment that will extract CO_2 from the ethanol production process and transfer the gas via a CO_2 pipeline to a storage site near the plant. Once fully operational, the Bridgeport CCS project is expected to capture and store approximately 175,000 tons of CO_2 annually (equivalent to 95% of total emissions from the ethanol plant's fermentation operations).

From *Ethanol Producer Magazine*. October 2022.

Large-Scale CCS Project Announced in Louisiana.

CF Industries, ExxonMobil, and EnLink Midstream will collaborate on a potential business prototype for industrial-scale CCS projects. The companies entered into a commercial agreement to capture CO_2 emissions from CF Industries' Ascension Parish manufacturing complex, transport it through EnLink's transportation network, and store it on property owned by ExxonMobil in Vermilion Parish in Louisiana (USA). The companies estimate the project to be capable of capturing and storing up to 2 million metric tons of CO_2 annually. The start-up for the project is scheduled for 2025.

From *Louisiana Governor John Bel Edwards News Release*. October 2022.

PROJECT AND BUSINESS DEVELOPMENTS *(cont.)*

North Sea Carbon Storage Trial Set to Begin.

Belgium and Denmark agreed to allow cross-border transport of captured CO_2 from industrial operations to the reservoirs being developed as part of the Greensand CCS project. The deal will allow CO_2 collected at sites in Belgium to be transported across the border into the Danish waters that host the storage site. For the trial project, CO_2 will be captured at a Belgian ethylene plant run by Ineoe Oxide and shipped to Ineos' Nini West oil platform, located off the coast of Denmark, where it will be injected into the former oilfield.

From *Upstream*. October 2022.

Approval Sought for CCS Hub in the USA.

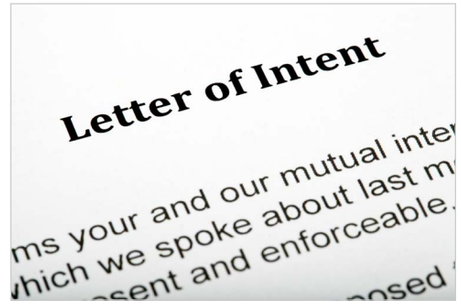
Gulf Coast Sequestration (GCS) initiated the process for obtaining a Class VI Underground Injection Control permit from the U.S. Environmental Protection Agency for a CCS project in Lake Charles, Louisiana (USA). The site is expected to be capable of storing 2.7 million metric tons of CO_2 per year.

From *gasworld*. October 2022.

Companies Sign Letter of Intent for CCUS Projects.

Energy company Western Midstream and an Occidental Petroleum subsidiary signed a Letter of Intent to collaborate on CCUS projects. The target regions for the potential projects are the Colorado DJ Basin and the Delaware Basin. The focus of the Letter of Intent is the delivery of low-carbon oil and natural gas products to end consumers, with the CO_2 being transported for storage, EOR, or utilization.

From *Carbon Herald*. October 2022.



LEGISLATION AND POLICY

New CCUS Bill Signed in Indiana.

A CCUS bill signed into law in Indiana (USA) addresses common issues affecting carbon storage regulations, including pore space ownership, liability, permitting, monitoring, and mineral rights primacy. The legislation is designed to address regulatory uncertainty, attract potential stakeholders for CCUS projects, and establish a path to the deployment of commercial-scale CCUS projects for owners and operators of large-scale carbon emitters in Indiana.

From *JD Supra*. October 2022.

EMISSIONS TRADING

Nova Scotia to Replace Cap-and-Trade System.

Nova Scotia is proposing legislation for an emissions-reduction plan that would replace its cap-and-trade system for large industrial greenhouse gas (GHG) emitters. According to officials, the proposed changes to the Environment Act would create a pricing system based on GHG output. The Canadian province's current cap-and-trade system expires at the end of 2022. The new system, which still needs approval from the federal cabinet, would begin on January 1, 2023.

From *Canada's National Observer*. October 2022.

India to Launch National Carbon Trading Market.

In a ***recent energy bill***, the Indian government approved the creation of a national carbon market. According to the bill, the government will issue carbon credits to entities that choose to register under the carbon credit trading scheme. The carbon market will be voluntary at first, with plans to eventually roll out a mandatory cap-and-trade system.

From *Energy Monitor*. October 2022.

Singapore, Vietnam Sign Carbon Credits MOU.

Singapore and Vietnam signed a Memorandum of Understanding (MOU) to support decarbonization efforts in both countries by collaborating on energy and carbon credits. The MOU also includes collaboration on research, development, and deployment of low-carbon energy technologies.

From *Carbon Herald*. October 2022.

SCIENCE

Vibrating Trucks Used to Search for CO_2 Storage Sites.

University of Copenhagen researchers are using vibrating trucks to study the CO_2 storage potential of deep soil layers in northwest Zealand. The vibrations send powerful sound waves into the earth, which are reflected from the soil, registered by geophones, and transformed into a detailed image. The collected images are used to form an underground map that helps researchers find suitable locations for CO_2 storage.

From *Mirage News*. October 2022.

Antarctic Krill Valuable as Carbon Sink.

According to a report by the World Wide Fund for Nature, krill found in waters around the Antarctic Peninsula and Scotia Sea, which sits between Antarctica and South America, are worth an estimated $15.2 billion each year in carbon storage. The report calculated the value of the krill as a carbon sink based on the estimated "social cost of carbon," or the price, in U.S dollars, of releasing an extra metric ton of CO_2 after factoring in the net damages from its impact on global climate change.

From *The West Australian*. October 2022.

Scientists Study Conversion of CO_2 to Solid Minerals for Storage.

Pacific Northwest National Laboratory (PNNL) researchers studied how CO_2 converts from a gas to a solid in ultrathin films of water on underground rock surfaces, publishing their scientific review article in the journal ***Nature Reviews Chemistry***. The review discussed how mineralization work can lead to practical CO_2 storage systems.

From *Phys.org*. October 2022.

Pacific Northwest NATIONAL LABORATORY

PUBLICATIONS

CO_2 Pipeline risk assessment and comparison for the midcontinent United States.

The following is from the abstract of this article: "A comprehensive quantitative risk assessment for the construction and operation of CO_2 transportation networks considered for the Midcontinent United States was conducted. The results showed risks associated with CO_2 pipelines were significantly less than those of other pipeline types. The assessment used four conceptual pipelines of different lengths to discuss risks operators may see. The assessment evaluated the risk associated with construction and operation using data from the US Occupational Safety Health Administration to determine the risk of injury or death for pipeline workers and data from the US Pipeline and Hazardous Materials Safety Administration for CO_2, natural gas distribution, natural gas transmission/gathering, and non-CO_2 hazardous liquid pipelines to develop quantitative likelihood and severity values leading to risk values. The data for the assessment covered incidents from 2010 to 2017 for CO_2 pipelines. The average risk for construction and 30 years of operation for four CO_2 pipeline configurations ranging between 79 and 1,546 miles in length was found. The construction and operational risk averaged between $1,400,521 (approximately $0.02/tonne of CO_2) for the shorter pipeline (79 miles) and $27,481,939 (approximately $0.10/tonne of CO_2) for a longer pipeline (1,546 miles). The largest risks of fatality for CO_2 pipelines comes from vehicle transport. The largest operational risk to the pipeline was due to leakage. Public pipeline opposition is also a significant risk; it was not quantified but is addressed."

Andrew Duguid, Jared Hawkins, and Laura Keister, *International Journal of Greenhouse Gas Control*. (Subscription may be required.)

Sequestering CO_2 as CO_2 hydrate in an offshore saline aquifer by reservoir pressure management.

The following is from the abstract of this article: "CO_2 has been successfully sequestered in aquifers at shallow water depth as supercritical CO_2. However, at a water depth larger than 630 m in tropical regions, there exists a hydrate stability zone (HSZ) extending below the seafloor where CO_2 and water can exist as solid CO_2 hydrate. It is generally believed that CO_2 cannot be stored inside the HSZ as formation of CO_2 hydrate will impair CO_2 injectivity. In this study, [the authors] investigate the feasibility of storing CO_2 inside this HSZ by reservoir pressure management vis-à-vis the CO_2 hydrate formation pressure through the use of water producers and CO_2 injectors. [The authors] carry out simulations to investigate CO_2 storage in three aquifers in tropical waters each with an area of 94 km^2 (9.7 km × 9.7 km), thickness of 50 m, porosity of 30% and permeability of 3,000 md. Three confined aquifers are compared. Aquifer 1 is a shallow water aquifer without a HSZ. It has a water depth of 300 m and buried depth of 830 mbsf. Aquifer 2, straddling (60% inside and 40% outside) the HSZ, has a water depth of 800 m and buried depth of 70 mbsf. Aquifer 3, residing inside the HSZ, has a water depth of 800 m and buried depth of 30 mbsf. The reservoir pressure is managed by four corner wells which function either as CO_2 injectors or water producers. [The authors] simulate CO_2 injection into these aquifers with the help of water production to manage the reservoir pressure to stay below either the reservoir fracture pressure or the hydrate formation pressure."

Kai Zhang and Hon Chung Lau, *Energy*. (Subscription may be required.)

PUBLICATIONS *(cont.)*

Data-driven offshore CO_2 saline storage assessment methodology.

The following is from the abstract of this article: "The world produces approximately 50 billion tonnes of greenhouse gases annually. This is measured in CO_2-equivalents, and geologic CO_2 storage has the potential to advance decarbonization and mitigate greenhouse gas emissions. New technologies to assess offshore carbon storage are needed to address resource, regulatory, and commercial needs. Although most efforts to assess storage resources focus on onshore criteria, offshore reservoirs offer significant storage potential and distinct development challenges. Potential advantages of offshore carbon storage include being further from human population centers and less potential to interact with groundwater. The U.S. Department of Energy's method for evaluating storage capacity in non-oil-bearing saline reservoirs has been enhanced to support assessments for offshore environments in the Offshore CO_2 Saline Storage methodology (OCSS). This methodology applies data-driven capabilities to estimate saline storage capacity while accounting for features specific to offshore reservoirs. Features include changes in CO_2 density and sedimentary differences that impact estimates of permanence and capacity. The Offshore CO_2 Saline Storage Calculator mechanizes OCSS to estimate storage capacity. This paper presents the methodology and estimates for 18 geologic domains in the Gulf of Mexico. Potential storage distributions, sensitivity analyses, and the incorporation of spatial data and tools to support safe site selection are also discussed."

Lucy Romeo, Randal Thomas, MacKenzie Mark-Moser, Andrew Bean, Jennifer Bauer and Kelly Rose, *International Journal of Greenhouse Gas Control*. (Subscription may be required.)

Numerical Trend Analysis for Factors Affecting EOR Performance and CO_2 Storage in Tight Oil Reservoirs.

The following is from the abstract of this article: "Improved oil recovery from tight oil reservoirs to fulfill the fossil fuel requirements and the CO_2 storage to meet the net carbon zero objectives are the two motivations of this work. CO_2 is a major anthropogenic greenhouse gas and its emission to […] plants' atmosphere is hazardous, particularly causing global warming. Therefore, its injection in the sub-surface oil-bearing formations not only improves the oil recovery but also reduces the carbon footprint from the planet. In this study, a mechanistic numerical simulation model is built using typical U.S. tight oil reservoir rock and fluid properties. The reservoir model is equipped with a hydraulically fractured single horizontal well that is subjected to multiple sensitivities using the huff-n-puff technique. Detailed CO_2 trapping and diffusivity mechanisms at the nanopore scale are discussed that numerically define the CO_2 solubility in formation oil and it's trapping phenomenon into the nanopore spaces. The results show that CO_2 injection works predominantly to achieve significant incremental oil recovery. Also, the reservoir with lighter in-situ fluid composition and higher reservoir pressure further enhances the oil recovery due to improved diffusivity and the solubility of CO_2 into the reservoir fluid. It is also found that the increased number of huff-n-puff cycles and the incremental CO_2 injection volume in each cycle not only enhance the oil recovery performance but likewise help to trap a larger volume of CO_2 into a reservoir. A few diagnostic contour plots are also presented in this study to demonstrate the simultaneous effect of multiple hydraulic fracture parameters and the CO_2 injection volume for the directional EOR and CO_2 trapping performance. The findings of this study can help for a better understanding of designing EOR operations in tight oil reservoirs to achieve both goals concurrently."

Fahad Iqbal Syed, Temoor Muther, Vuong Pham Van, Amirmasoud Kalantari Dahaghi, and Shahin Negahban, *Fuel*. (Subscription may be required.)

Heat pulse testing at monitoring wells to estimate subsurface fluid velocities in geological CO_2 storage.

The following is from the abstract of this article: "Monitoring the injected CO_2 during geological CO_2 storage (GCS) is essential to assure containment and identify CO_2 leakage. In this work, a new approach is introduced to estimate the evolution of the downhole fluid velocity at a monitoring well and identify CO_2 arrival time using in-well heat pulse/tracer test. The proposed technique involves using a downhole heater to generate a series of heat pulses and measuring their corresponding temperature response. The surface temperature of the downhole heater is controlled by the supplied electrical power and the heat loss by convection to the surroundings. Convective heat transfer is well described using Newton's law of cooling in which the temperature difference between the heater and the surrounding fluids drives the heat transfer, for which the convection heat transfer coefficient (h) controls the magnitude of heat loss. Among various factors that control h, it depends on the type of the flowing fluid and its velocity. Through analyzing the measured temperature at different heat pulses, the changes in h - due to mobilization of the in-situ brine or CO_2 arrival - can be estimated. Consequently, the velocity of the flowing fluid across the heater can be obtained. Since heat transfer by convection is sensitive to the type of the surrounding fluid, intrusion of CO_2 can be detected from the relatively higher surface temperature obtained at CO_2 arrival. Churchill and Bernstein (1977)'s correlation is adopted to estimate the change of fluid velocity in terms of the change in h. To demonstrate the validity of the proposed technique, the results are applied and validated against those of COMSOL Multiphysics simulation tool for single-phase brine (before CO_2 arrival) and single-phase CO_2 (after CO_2 arrival). The observed temperature heating is sensitive to the flowing fluid velocity and fluid type. The temperature signal observed at CO_2 arrival is large and easily detectable using temperature monitoring tool which provides reliable indication for tracking CO_2 arrival at monitoring wells compared with passive temperature monitoring. The results obtained using the proposed technique agree very well with the numerical results obtained from the simulation tool with a maximum estimation error of 7 percent."

Refaat G. Hashish and Mehdi Zeidouni, *Journal of Petroleum Science and Engineering*. (Subscription may be required.)

PUBLICATIONS *(cont.)*

DAS signature of reservoir pressure changes caused by a CO_2 injection: Experience from the CO_2CRC Otway Project.

The following is from the abstract of this article: "Distributed Acoustic Sensing (DAS) is a fast-developing technology and is being actively used in geophysical monitoring applications. DAS technology is based on continuous measurements along a fibre-optic cable and can record seismic waves/signals that induce axial strain in the cable. Most DAS systems are designed to measure signals higher than 1 Hz; however some DAS systems are sensitive to low-frequency (< 1 Hz) signals such as reservoir pressure variations. At the time of CO_2 injection within the CO_2CRC Otway Project, pressure related strain-rate DAS signals were observed in two monitoring wells. These signals are highly correlated with the pressure signals measured by borehole pressure gauges above the perforations in monitoring wells. Comparison of DAS measurements and pressure measurements shows a linear relationship between the two datasets. Analysis of data shows that DAS is able to detect reservoir pressure variations higher than 10^{-4} psi/s. Analysis of pressure variations and strain calculated from DAS strain rate values allows estimation of the elastic modulus of the reservoir formation. Obtained results show that DAS systems can be utilised not only as seismic sensors, but also as continuous pressure sensors that can help track possible CO_2 leakages into the overburden. In contrast to traditional pressure gauges, DAS is also capable of tracking the pressure profile along the entire well. DAS pressure sensing capabilities open up many new applications to complement subsurface reservoir pressure monitoring, CCUS and hydrogeological studies."

Evgenii Sidenko, Konstantin Tertyshnikov, Boris Gurevich, and Roman Pevzner, *International Journal of Greenhouse Gas Control*. (Subscription may be required.)

Fundamental study and utilization on supercritical CO_2 fracturing developing unconventional resources: Current status, challenge and future perspectives.

The following is from the abstract of this article: "Under the fact that considerable exploration and production of unconventional resources and worsening global climate, reducing carbon emission and rationally utilizing carbon resources have been drawn increasing attention. Supercritical CO_2 (SC–CO_2) has been proposed as anhydrous fracturing fluid to develop unconventional reservoirs, since its advantages of reducing water consumption, reservoir contamination etc. Well understanding of SC-CO_2 fracturing mechanism and key influencing factors will exert significant impact on the application of this technology in the field. In this paper, the fundamental studies on SC-CO_2 fracturing from the aspects of laboratory experiment and simulation are reviewed. The fracturing experimental setups, fracture monitoring and characterizing methods, unconventional formation categories, numerical simulation approaches, fracturing mechanism and field application etc., are analyzed. The fundamental study results indicate that compared with conventional hydraulic fracturing, SC-CO_2 fracturing can reduce fracture initiation pressure and easily induce complex fracture networks with multiple branches. The field test further verifies the application prospect and the possibility of carbon storage. However, due to the limitation of reservoir complexity and attributes of SC-CO_2, massive challenges will be encountered in SC-CO_2 fracturing. According to the current research status, the limitations in basic research and field application are summarized, and the future development direction of this technology and relevant suggestions are proposed."

Bing Yang, Hai-Zhu Wang, Gen-Sheng Li, Bin Wang, Liang Chang, Gang-Hua Tian, Cheng-Ming Zhao. and Yong Zheng, *Petroleum Science*. (Subscription may be required.)

Tracer analysis in flow channel characterization and modelling of gas and CO_2 injection EOR in unconventional reservoirs.

The following is from the abstract of this article: "A large amount of unproduced oil remains in unconventional shale reservoirs. In this paper [the authors] present the use of water and oil tracers as a key factor in flow channel characterization and in constructing a viable numerical model to forecast oil and gas recovery by depletion drive and enhancing oil recovery (EOR) by hydrocarbon gas or CO_2 injection in Niobrara and Codell formations in the Denver-Julesburg (DJ) Basin. First, a dual-porosity compositional model was built based on seismic interpretation results, well logs, and core analysis. Two hydraulic fracture scenarios, (1) uniform dimensions and (2) variable dimensions, were included in the static rock frame of the numerical model. Production performance matching demonstrated that the use of variable length and height for hydraulic fractures led to a more realistic representation of the reservoir performance. On another front, injection of water and oil tracers and flowback analysis provided the means to better quantify the fracture network distribution, flow communication between wells, and hydraulic fracture performance in each well. Finally, two 'huff-and-puff' (injection, shut-in, production) cycles of lean gas and CO_2 injection into the reservoir were modeled to assess EOR potential of cyclic gas injection. With identical gas injection rates, lean gas produced more oil than CO_2; however, CO_2-EOR modeling results indicated that a substantial amount of CO_2 was stored in the reservoir. The net carbon stored after CO_2-EOR was approximately 13% of the injected CO_2 and CO_2 utilization was 39,000 scf per incremental oil barrel produced which is much larger than the average CO_2 utilization of about 12,000 scf per incremental oil barrel produced in conventional reservoirs. However, the produced CO_2 from unconventional reservoir EOR operation can be recycled to achieve complete storage of CO_2 — rendering CO_2-EOR an effective means of decarbonization. Finally, transmissibility analysis of an existing major fault zone in the study area indicated that CO_2 did not leak via a major fault in the study area nor via the associated nearby natural fractures in the study area."

Yanrui Ning, Hossein Kazemi, Ali Tura, and T.L. Davis, *Journal of Petroleum Science and Engineering*. (Subscription may be required.)

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).

Click here to manage your Carbon Transport and Storage Newsletter subscription options or to unsubscribe.

The ***National Energy Technology Laboratory (NETL)***, part of DOE's national laboratory system, is owned and operated by the U.S. Department of Energy (DOE). NETL supports DOE's mission to advance the national, economic, and energy security of the United States.

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