

CSN

CARBON STORAGE
NEWSLETTER

FEBRUARY 2018

This newsletter is compiled by the National Energy Technology Laboratory to provide information on recent activities and publications related to carbon storage. It covers domestic, international, public sector, and private sector news in the following areas:

- ▷ DOE/NETL HIGHLIGHTS
- ▷ ANNOUNCEMENTS
- ▷ PROJECT and BUSINESS DEVELOPMENTS
- ▷ LEGISLATION and POLICY
- ▷ EMISSIONS TRADING
- ▷ CLIMATE and SCIENCE NEWS
- ▷ JOURNAL ARTICLES
- ▷ REPORTS and OTHER PUBLICATIONS

CARBON STORAGE PROGRAM
DOCUMENTS and
REFERENCE MATERIALS

- ▷ Carbon Storage Educational Resources
- ▷ Program Reports, Plans, and Roadmaps
- ▷ Conference Proceedings
- ▷ Carbon Storage Portfolio
- ▷ Systems Analysis
- ▷ Peer Review
- ▷ Best Practices Manuals
- ▷ Fossil Energy Techlines



DOE/NETL HIGHLIGHTS

DOE Issues Notice of Intent for Carbon Storage Funding Opportunities.

The U.S. Department of Energy's (DOE) Office of Fossil Energy (FE) and the National Energy Technology Laboratory (NETL) issued a Notice of Intent (NOI) for a Funding Opportunity Announcement (FOA) for cost-shared research and development (R&D) projects that will enhance carbon storage efficiency and safety. DE-FOA-0001826, "Developing Technologies to Advance the Understanding of State of Stress and Geomechanical Impacts within the Subsurface," focuses on two areas of interest (AOI): *Tools and Methods for Determining Maximum Principal Stress in the Deep Subsurface*, under which selected projects will develop tools and methods for determining in-situ stress state in the deep subsurface, and *Geomechanical Methods for Understanding Impact of Vertical Pressure Migration during Injection*, under which selected projects will predict, and compare with field observations, the temporal and spatial stress and pressure changes in the underburden that result from injection and the impacts related to these changes. The FOA supports the *Carbon Storage Program*.

ANNOUNCEMENTS

DOE Swears in New Assistant Secretary for Fossil Energy.

The new Assistant Secretary for DOE's FE was officially sworn in by the Energy Secretary. The Assistant Secretary for Fossil Energy (ASFE) will oversee FE's R&D program; serve as a primary policy advisor for the Energy Secretary and DOE on issues involving U.S. fossil fuels; and supervise the more than 1,000 scientists, engineers, technicians, and administrative members of the FE staff across the Nation.

RGGI States Initiate Auction Process for Auction 39.

The states participating in the Regional Greenhouse Gas Initiative (RGGI) released the *Auction Notice* and application materials for their 39th quarterly auction of carbon dioxide (CO₂) allowances, which is to be held March 14, 2018. The notice and materials provide potential auction participants with the information needed to submit applications and indicate their intent to bid. Using a minimum price of \$2.20, Auction 39 will offer 13,553,767 CO₂ allowances for sale.

Forum on CCS Cooperation.

Bellona held its second forum on Nordic carbon capture and storage (CCS) cooperation, focusing on Norway and Sweden joining forces for CO₂ management. The industry and environmental non-governmental organization representatives from Oslo, Norway, and Gothenburg, Sweden, that attended the forum discussed the reduction of greenhouse gases (GHGs) and how three CCS projects around the Oslo fjord showcase the potential of CO₂ capture plants being built on cement and waste incineration plants.

Report on Role of CCS.

The International Energy Agency (IEA)-established Coal Industry Advisory Board (CIAB) released a report on the investment in CCS. Among other findings, CIAB reported on the Australian government promoting CCS investment and working with industry to co-develop CCS technology projects that are industrially scalable.



*Steven Winberg,
Assistant Secretary for Fossil Energy*

ANNOUNCEMENTS *(cont.)*

[Online Tool Calculates Soil's Carbon Storage Potential.](#)

Researchers from the International Center for Tropical Agriculture (CIAT) developed *The Soil Carbon App*, an online tool that can calculate soil's capacity for storing organic carbon. The tool can be used by investors and decision makers to assess to which degree planned efforts to restore degraded land will bind organic carbon in soil and reduce potential CO₂ emissions.

[Free Online CCS Course.](#)

The University of Edinburgh has developed a free, five-week massive open online course (MOOC) explaining CCS technology. The course, which begins in March 2018, will be taught by leading academics at the University, and offers the option of gaining a Verified Certificate.

PROJECT and BUSINESS DEVELOPMENTS

[UAE Company to Expand CCUS Technology.](#)

The Abu Dhabi National Oil Company (ADNOC) announced plans to expand its use of carbon capture, utilization, and storage (CCUS) technology. The United Arab Emirates (UAE) company said it is expanding its use of the technology in order to meet an increase in CO₂ utilization for enhanced oil recovery (EOR) over the next 10 years. Starting in 2021, ADNOC will increase CO₂ utilization, expecting to reach 250 million standard cubic feet per day (MMscfd) by 2027 by capturing additional CO₂ from its gas processing plants and injecting it into different onshore oil fields. To date, ADNOC has stored approximately 240,000 metric tons of CO₂. From *Thomson Reuters Zawya* on January 17, 2018.

[Chilean Government Agrees to CCS Plan.](#)

The government of Chile and the Chilean association of electricity producers have agreed to not build new coal power plants that are not equipped with CCS or equivalent technologies. In addition, the two parties will also establish a joint working group that will focus on phasing out the operation of coal-fired power plants that do not currently utilize CCS or equivalent technologies.

[Carbon Capture Testing at Facility for Advancement of CCS Technologies.](#)

Cansolv Technologies will use SaskPower's carbon capture test facility to explore new and existing capture technologies, from which the research gained will be used to inform future projects and the next generation of CCS technologies. Testing on new CCS technologies was completed at SaskPower's carbon capture test facility in 2017; with SaskPower's "plug-and-play" system, the tested technology has been removed and new equipment and chemistry will be added for testing. From *Carbon Capture Journal* on January 22, 2018.

[Carbon Fund Invests in Carbon Project.](#)

Climate Trust Capital, a U.S.-based private investment fund, has invested in a carbon project in the biogas sector. Climate Trust Capital will invest more than \$1 million in a covered lagoon digester that will, among other effects, produce carbon offsets under California's (USA) cap-and-trade system. The investment comes from Climate Trust Capital's Fund I, which focuses on investing in U.S.-based carbon offset projects. From *The Climate Trust Media Release (via PR-Web)* on January 23, 2018.

LEGISLATION and POLICY

[Oregon Unveils Carbon Legislation.](#)

Oregon lawmakers are offering public review of a *pair of bills* designed to reduce GHG emissions. Currently labeled as *Legislative Concept 44* (Senate version) and *Legislative Concept 176* (House version), the "cap and invest" bills would establish limits on GHG emissions in Oregon, USA, requiring the purchase of allowances to cover output above the limit. The cap and available allowances would gradually be reduced in order to meet Oregon's GHG emissions goals of 45 percent below 1990 levels by 2035, and 80 percent below 1990 levels by 2050. From *Oregon Live* on January 9, 2017.

[DNV GL Launches Certification Framework and Recommended Practice for CCS.](#)

DNV GL has launched a framework for certifying geologic storage of CO₂, as well as a recommended practice for the design and operation of CO₂ pipelines. The *certification framework*, which enables verification and conformity with the new International Organization for Standardization (ISO) standard "ISO 27914:2017 Carbon dioxide capture, transportation and geological storage — Geological storage," represents international consensus on the requirements for the safe and effective storage of CO₂ in geologic formations. The *recommended practice* provides guidance on safe and reliable design, construction, and operation of pipelines intended for large-scale transportation of CO₂, and enables compliance with the requirements of the new ISO standard "ISO 27913:2017 Carbon dioxide capture, transportation and geological storage — Pipeline transportation systems." From *DNV GL Press Release* on January 17, 2018.

[Washington State House Committee Approves Low-Carbon Standards Bill.](#)

A Washington state House committee approved a bill requiring fuel producers and importers to reduce GHG emissions. *House Bill 2338*, which will look to reduce CO₂ emissions from the transportation sector, will now head to a fiscal committee. If passed, the bill would direct the state's Department of Ecology to adopt a clean fuels program requiring fuel producers to reduce their carbon emissions 10 percent below 2017 levels by 2028. The program would begin in 2020. From *AP News* on January 24, 2018.

[State Lawmakers Form Alliance on Carbon Pricing.](#)

State legislators from nine U.S. states announced the formation of a coalition focused on, among other areas, reducing CO₂ emissions, ensuring policy proposals, and developing market-based solutions. The Carbon Costs Coalition, in which lawmakers from Connecticut, Maryland, Massachusetts, New Hampshire, New York, Oregon, Rhode Island, Vermont, and Washington have been meeting informally for two years, has been working with business leaders on implementing a carbon price. From *National Caucus of Environmental Legislators (NCEL) Press Release* on January 31, 2018.

[CCS Bill Revived.](#)

Legislation to boost CCS projects through the tax code has been introduced into the U.S. House of Representatives. According to the bill's sponsors, *H.R. 4857* ("The CO₂ Regulatory Certainty Act") aligns with tax guidelines and U.S. regulations related to CCS. From *E&E News* on January 23, 2018.

EMISSIONS TRADING

New Jersey Re-Joins RGGI..

The New Jersey Governor initiated the process of rejoining RGGI after the state had previously withdrawn from the cap-and-trade program in 2011. The next step is for the state's legislature to pass legislation to implement the Governor's order and devise a spending plan for the funds generated in RGGI's trading auctions, which, to date, have generated \$2.8 billion in proceeds to finance clean energy and energy efficiency projects. From *Reuters* on January 29, 2018.



Mexico Launches Updated Carbon Market.

Mexico will launch a national carbon emissions trading system (ETS) in 2018 in order to fund projects that help reduce emissions. According to Mexico's Ministry of Environment and Natural Resources, approximately 100 Mexican companies are currently participating in the California ETS to determine how carbon market prices would be set in Mexico. Once it becomes operational, the Mexican government will plan to link it with the markets in California, USA, and Québec, Canada. From *Diálogo Chino* on January 8, 2017.

UAE Proposes Emissions Trading.

The UAE's Security and Commodities Authority (SCA) announced an initiative to launch CO₂-focused emissions trading within the region. The initiative is part of an SCA-deliberated roadmap to ensure sustainable financial markets and comply with world standards. From *Al Bawaba* on January 29, 2018.

CLIMATE and SCIENCE NEWS

Researchers Discover Catalyst for Converting CO₂.

Scientists from the University of Toronto; the University of California, Berkeley; and the Canadian Light Source (CLS) have developed a method for the efficient conversion of CO₂ into plastic. The researchers were able to do so by designing a catalyst and identifying the conditions that maximize ethylene production during reaction, while also minimizing methane and carbon monoxide production. The research paper, titled "*Catalyst electro-redox controls morphology and oxidation state for selective carbon dioxide reduction*," was published in the online journal *Nature Catalysis*. From *The Independent* on January 16, 2018.

Coastal Water Absorbing More CO₂.

According to researchers, the water over the continental shelf is storing more atmospheric CO₂, which increases the acidity of seawater and has the potential to affect the health of marine organisms and the ocean ecosystem. By using recently available and historical data from the previous 35 years to calculate global trends of CO₂ concentration increases in the coastal ocean, scientists found that while the amount of CO₂ in the open ocean is increasing at the same rate as in the atmosphere, these same CO₂ concentrations are increasing slower in the coastal ocean. According to the research team, the study's findings suggest that the continental shelves are becoming a crucial element in the global carbon cycle. From *Chemeurope* on February 2, 2018.

JOURNAL ARTICLES

U.S. DOE's Economic Approaches and Resources for Evaluating the Cost of Implementing Carbon Capture, Utilization, and Storage (CCUS).

The following is the Abstract of this article: "[DOE] and [NETL] are world leaders in CCUS research and analysis. They have developed resources and a set of economic tools to evaluate the cost to implement CCUS for each segment of the value chain: capture, transport, and storage. This paper provides a comprehensive review of the economic models and analytical approaches DOE/NETL has developed for assessing the CO₂ capture, storage, and transport cost drivers that impact the entire CCUS value chain. Failure to effectively evaluate the economic opportunity for CCUS technology to reduce CO₂ emissions would deter wide-spread deployment. DOE's economic models and resources enable a variety of possible analytical approaches to evaluate the economics associated with deploying CCUS. The resources are open-source so that interested stakeholder groups can apply them to their specific problems, and to enable feedback to improve these models moving forward." **Derek Vikara, Chung Yan Shih, ShangMin Lin, Allison Guinan, Timothy Grant, David Morgan, and Donald Remson**, *Journal of Sustainable Energy Engineering*. (Subscription may be required.)

The Value of CCS under Current Policy Scenarios: NDCs and Beyond.

The following is the Abstract of this article: "This paper describes preliminary results of analysis using the Global Change Assessment Model (GCAM) to evaluate the potential role of CCS in achieving emissions reduction targets. Scenarios are modelled using the *Paris-Increased Ambition* (PIA) case developed by Fawcett et al. (2015), and a more aggressive *Paris Two-Degree Ambition* (P2A) case. Both cases are based upon nationally determined contributions (NDCs) agreed to at the UNFCCC Conference of Parties (COP-21) in December 2015, coupled with additional mitigation effort beyond the 2030 Paris time-frame, through the end of the century. Analysis of CCS deployment and abatement costs under both policy scenarios suggests that, as modelled, having CCS in the technological portfolio could reduce the global cost of addressing emissions reduction targets specified under the policy scenario by trillions of dollars. Through the end of the century, total global abatement costs over the century associated with the PIA case – with five percent annual reduction in emission intensity and reaching 2.2 degrees by 2100 – are reduced by \$15 trillion USD in the scenario where CCS is available to deploy by 2025 and remains available through 2100, nearly halving the cost of climate change abatement. Under the more ambitious P2A case, with 8 percent annual reduction in emission intensity and reaching 1.9 degrees by 2100, the availability of CCS reduces global abatement costs by \$22 trillion USD through the end of the century, again nearly halving the costs of addressing the policy, relative to achieving the same target using an energy portfolio that does not include CCS. PIA and P2A scenarios with CCS result in 1,250 and 1,580 GtCO₂ of global geologic storage through the end of the century, respectively." **Casie L. Davidson, Robert T. Dahowski, Haewon C. McJeon, Leon E. Clarke, Gokul C. Iyer, and Matteo Muratori**, *Energy Procedia*. (Subscription may be required.)

JOURNAL ARTICLES *(cont.)*

A review of developments in carbon dioxide storage.

The following is the Abstract of this article: "CCS has been identified as an urgent, strategic and essential approach to reduce anthropogenic CO₂ emissions, and mitigate the severe consequences of climate change. [Carbon dioxide] storage is the last step in the CCS chain and can be implemented mainly through oceanic and underground geological sequestration, and mineral carbonation. This review paper aims to provide state-of-the-art developments in CO₂ storage. The review initially discussed the potential options for CO₂ storage by highlighting the present status, current challenges and uncertainties associated with further deployment of established approaches (such as storage in saline aquifers and depleted oil and gas reservoirs) and feasibility demonstration of relatively newer storage concepts (such as hydrate storage and CO₂-based enhanced geothermal systems). The second part of the review outlined the critical criteria that are necessary for storage site selection, including geological, geothermal, geohazards, hydrodynamic, basin maturity, and economic, societal and environmental factors. In the third section, the focus was on identification of CO₂ [behavior] within the reservoir during and after injection, namely injection-induced seismicity, potential leakage pathways, and long-term containment complexities associated with CO₂-brine-rock interaction. In addition, a detailed review on storage capacity estimation methods based on different geological media and trapping mechanisms was provided. Finally, an overview of major CO₂ storage projects, including their overall outcomes, were outlined. This review indicates that although CO₂ storage is a technically proven strategy, the discussed challenges need to be addressed in order to accelerate the deployment of the technology. In addition, beside the necessity of techno-economic aspects, public acceptance of CO₂ storage plays a central role in technology deployment, and the current ethical mechanisms need to be further improved." **Mohammed D. Aminu, Seyed Ali Nabavi, Christopher A. Rochelle, and Vasilije Manovic**, *Applied Energy*. (Subscription may be required.)

An interval robust stochastic programming method for planning carbon sink trading to support regional ecosystem sustainability— A case study of Zhangjiakou, China.

The following is the Abstract of this article: "In this study, an interval two-stage robust optimization method (ITRM) is developed for planning carbon-emission trading between ecosystem and industrial systems under uncertainty. The developed ITRM incorporates interval-parameter programming (IPP) and two-stage stochastic programming (TSP) within a robust optimization (RO) framework to deal with uncertainties presented as both probabilities and intervals and to reflect economic penalties as corrective measures or recourse against any infeasibilities arising due to a particular realization of an uncertain event. Compared with the traditional TSP, ITRM can effectively reflect the risk generated by stochastic programming process and enhance the robustness of the model, such that it is suitable for risk-averse planners under high-variability conditions. The ITRM is applied to a case of carbon sink trading of Zhangjiakou and CO₂ emission planning under uncertainty. The results obtained reveal that carbon trading mechanism can greatly optimize the allocation of resources and reduce the cost of emission abatement. The results also reveal that the contribution of forest ecosystems to carbon sinks and ecosystem services than others. Moreover, the system benefit would decrease as the robustness level is raised. Results indicate that when the robustness level is relatively low, the decision makers would pay more attention to the economic benefit of the system and neglect the stability of the system." **Z.S. Guo, Y.P. Li, G.H. Huang, S.W. Jin, and Brian W. Baetz**, *Ecological Engineering*. (Subscription may be required.)

Heterogeneity, pore pressure, and injectate chemistry: Control measures for geologic carbon storage.

The following is the Abstract of this article: "Desirable outcomes for geologic carbon storage include maximizing storage efficiency, preserving injectivity, and avoiding unwanted consequences such as caprock or wellbore leakage or induced seismicity during and post injection. To achieve these outcomes, three control measures are evident including pore pressure, injectate chemistry, and knowledge and prudent use of geologic heterogeneity. Field, experimental, and modeling examples are presented that demonstrate controllable GCS via these three measures. Observed changes in reservoir response accompanying CO₂ injection at the Cranfield (Mississippi, USA) site, along with lab testing, show potential for use of injectate chemistry as a means to alter fracture permeability (with concomitant improvements for sweep and storage efficiency). Further control of reservoir sweep attends brine extraction from reservoirs, with benefit for pressure control, mitigation of reservoir and wellbore damage, and water use. State-of-the-art validated models predict the extent of damage and deformation associated with pore pressure hazards in reservoirs, timing and location of networks of fractures, and development of localized leakage pathways. Experimentally validated geomechanics models show where wellbore failure is likely to occur during injection, and efficiency of repair methods. Use of heterogeneity as a control measure includes where best to inject, and where to avoid attempts at storage. An example is use of waste zones or leaky seals to both reduce pore pressure hazards and enhance residual CO₂ trapping." **Thomas Dewers, Peter Eichhubl, Ben Ganis, Steven Gomez, Jason Heath, Mohamad Jammoul, Peter Kobos, Ruijie Liu, Jonathan Major, Ed Matteo, Pania Newell, Alex Rinehart, Steven Sobolik, John Stormont, Mahmoud Reda Taha, Mary Wheeler, and Deandra White**, *International Journal of Greenhouse Gas Control*. (Subscription may be required.)

Carbon tariffs: An analysis of the trade, welfare, and emission effects.

The following is the Abstract of this article: "The potential of carbon tariffs to restore competitiveness, avoid carbon leakage, and reduce global carbon emissions has been prominently discussed. To analyze the effects of carbon tariffs on trade, welfare, and carbon emissions, [the authors] develop a multi-sector, multi-factor structural gravity model that allows an analytical and quantitative decomposition of the emission changes into scale, composition, and technique effects. [The authors'] analysis shows that carbon tariffs are able to reduce world emissions, mainly via altering the production composition within and across countries, hence reducing carbon leakage. This reduction comes at the cost of lower world trade flows and lower welfare, especially for developing countries. Applying [the authors'] framework to investigate the effects of the emission reduction pledges made by the Annex I countries in the Copenhagen Accord, [the authors] find that combining national emission targets with carbon tariffs would increase the Accord's effectiveness by lowering the leakage rate from 13.4% to 4.1% (with bootstrapped 95% confidence intervals of [11.5, 15.8] and [3.3, 4.9], respectively)." **Mario Larch and Joschka Wanner**, *Journal of International Economics*. (Subscription may be required.)

JOURNAL ARTICLES *(cont.)*

Supercritical CO₂ uptake by nonswelling phyllosilicates.

The following is the Abstract of this article: "Interactions between supercritical (sc) CO₂ and minerals are important when CO₂ is injected into geologic formations for storage and as working fluids for [EOR], hydraulic fracturing, and geothermal energy extraction. It has previously been shown that at the elevated pressures and temperatures of the deep subsurface, scCO₂ alters smectites (typical swelling phyllosilicates). However, less is known about the effects of scCO₂ on nonswelling phyllosilicates (illite and muscovite), despite the fact that the latter are the dominant clay minerals in deep subsurface shales and mudstones. [The authors'] studies conducted by using single crystals, combining reaction (incubation with scCO₂), visualization [atomic force microscopy (AFM)], and quantifications (AFM, X-ray photoelectron spectroscopy, X-ray diffraction, and off-gassing measurements) revealed unexpectedly high CO₂ uptake that far exceeded its macroscopic surface area. Results from different methods collectively suggest that CO₂ partially entered the muscovite interlayers, although the pathways remain to be determined. [The authors] hypothesize that preferential dissolution at weaker surface defects and frayed edges allows CO₂ to enter the interlayers under elevated pressure and temperature, rather than by diffusing solely from edges deeply into interlayers. This unexpected uptake of CO₂ can increase CO₂ storage capacity by up to ~30% relative to the capacity associated with residual trapping in a 0.2-porosity sandstone reservoir containing up to 18 mass % of illite/muscovite. This excess CO₂ uptake constitutes a previously unrecognized potential trapping mechanism." **Jiamin Wan, Tetsu K. Tokunaga, Paul D. Ashby, Yongman Kim, Marco Voltolini, Benjamin Gilbert, and Donald J. DePaolo**, *Proceedings of the National Academy of Sciences of the United States of America*. (Subscription may be required.)

Policy Parity for CCS? – Public Preference on Low Carbon Electricity.

The following is the Abstract of this article: "To examine the rationale for policy parity of three basic low carbon power sources, the consumer preference for those power sources was evaluated by choice experiment through a public survey in December 2015 - January 2016. A sample with decent representativeness was obtained by two stage stratified sampling and door-to-door canvassing. The choice questions were designed with realistic attributes simulating power retail market starting from April 2016. Through the data analysis, using random parameter logit model, [the authors] found that respondents' WTP shows that they considered not only CO₂ emission reductions but also the characteristics of the three methods of low carbon power generation. It is also found that WTP is 11 yen per 1% increase in renewables, 14 yen per 1% decrease in nuclear (this WTP varies from one individual to another), and 4 yen per 1% increase in thermal power generation with CCS. The results of WTPs for the share of renewables and CCS in the power mix of new electricity retail companies in the future market rationalizes the necessity of policy parity to some extent for those technologies implying inclusion of CCS in the FIT but not nuclear." **Kenshi Itaoka, Aya Saito, and Makoto Akai**, *Energy Procedia*. (Subscription may be required.)

REPORTS and OTHER PUBLICATIONS

Reduced-Order Model for the Geochemical Impacts of CO₂, Brine, and Trace Metal Leakage into an Unconfined, Oxidizing Carbonate Aquifer, Version 2.1.

BERKELEY LAB

NRAP Technical Team

The following is from the Executive Summary of this document: “The National Risk Assessment Partnership (NRAP) is a DOE-funded program to develop and demonstrate a methodology and toolset for predicting long-term risk profiles needed for quantifying potential liabilities at a CO₂ storage project. The approach taken by NRAP is to divide the system into components, including injection target reservoirs, wellbores, natural pathways including faults and fractures, groundwater, and the atmosphere. Next, detailed physics- and chemistry-based models of each component are developed. Using the results of the detailed models, efficient, simplified models, termed reduced-order models (ROM) are then developed for each component. Finally, the component ROMs are integrated into a system model that calculates risk profiles. The groundwater component models are based on two sites: the confined reducing, sandstone High Plains aquifer, which extends from South Dakota to Texas; and the unconfined, oxidizing carbonate Edwards aquifer in south-central Texas. Two ROMs have been developed for each aquifer, one with varied hydraulic parameters, and another with varied geochemical parameters, resulting in four separate groundwater ROMs. This report focuses on [Pacific Northwest National Laboratory’s (PNNL’s)] development of the geochemical ROM for the Edwards aquifer. The approach used to develop the groundwater geochemistry ROM for the Edwards aquifer was to develop a complex model of groundwater flow and reactive transport in the shallow, urban unconfined portion of the aquifer near San Antonio, Texas. The areal model domain covers a 5×8-km area and is 150-m thick, with upscaled heterogeneous porosity and permeability. This model, using the STOMP (Subsurface Transport Over Multiple Phases) simulator, used a well leak ROM provided by Los Alamos National Laboratory (LANL) to calculate CO₂ and brine leakage rates into the aquifer. The STOMP model included equilibrium, kinetic mineral, and adsorption reactions related to the carbonate and clay minerals in the aquifer reacting with major ions and trace metals in groundwater, as well as CO₂ and brine containing sodium (Na), chloride (Cl), arsenic (As), cadmium (Cd), and lead (Pb) leaking from the wellbore.”

Updated short-term traded carbon values used for UK public policy appraisal.

The following is from the Background of this UK Department for Business, Energy, and Industrial Strategy (BEIS) document: “BEIS’s short-term traded carbon values for UK public policy appraisal are used for valuing the impact of government policies on emissions in the traded sector, i.e. those sectors covered by the EU Emissions Trading System (EU ETS). Short-term values quoted in this paper correspond to the period up to 2030 and long-term values correspond to the period post-2030. In 2009, the Department of Energy and Climate Change (DECC) set out a methodology for producing traded sector carbon values to 2050 in the paper ‘Carbon Valuation in UK Public Policy Appraisal: A Revised Approach’ (July 2009). The paper advocated moving from a social cost of carbon/damage cost approach for valuing carbon to a target consistent resource-cost approach. In 2012, the hybrid methodology for producing short-term traded carbon values was adopted and involved using a market-based approach using futures prices to produce short-term traded carbon values in the central scenario, and fundamentals-based high and low scenarios for sensitivity purposes. Since 2012, these values have been updated annually using the BEIS Carbon Price Model (BCPM). These values are being revised again as part of the annual process for updating BEIS’s analytical projections and assumptions.”

Geological CO₂ Sequestration Atlas of Miocene Strata, Offshore Texas State Waters.

The following is the Abstract of this University of Texas at Austin Bureau of Economic Geology document: “The purpose of this atlas is to provide a summary of research undertaken as part of a multiyear study (2009–2014) of Texas State Waters and the adjacent Federal Offshore continental shelf (i.e., near offshore waters of the State of Texas). The goal of the study was to assess and analyze existing data from historical hydrocarbon-industry activities in a regional transect of the Texas coast in order to verify the ability of Miocene-age rocks of the region to safely and permanently store large amounts of anthropogenic (industrial) CO₂. The authors’ intent in producing this atlas is to provide a resource for exploring the geological CO₂ sequestration potential of the near offshore waters of the State of Texas by populating the atlas with both large-scale regional, qualitative and detailed quantitative information that can help operators quickly assess CO₂ sequestration potential at specific sites. This is the first comprehensive attempt to accomplish this goal in the near offshore of the Gulf Coast and United States.”

ABOUT DOE'S CARBON STORAGE PROGRAM

The **Carbon Storage Program** advances the development and validation of technologies that enable safe, cost-effective, permanent geologic storage of CO₂. The Carbon Storage Program also supports the development of best practices for CCS that will benefit projects implementing CCS at a commercial scale, such as those being performed under NETL's Clean Coal Power Initiative and Industrial Carbon Capture and Storage Programs. The technologies being developed and the small- and large-scale injection projects conducted through this program will be used to benefit the existing and future fleet of fossil fuel power-generating facilities by developing tools to increase our understanding of the behavior of CO₂ in the subsurface and identifying the geologic reservoirs appropriate for CO₂ storage.

The [Carbon 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 Storage Program Resources



The [National Energy Technology Laboratory's CCS Database](#) includes active, proposed, and terminated CCS projects worldwide. The information is taken from publically available sources to provide convenient access to information regarding efforts by various industries, public groups, and governments towards development and eventual deployment of CCS technology. NETL's CCS Database is available as a Microsoft Excel spreadsheet and also as a customizable layer in Google Earth.

Newsletters, program fact sheets, best practices manuals, roadmaps, educational resources, presentations, and more are available via the [Carbon Storage Program Publications webpage](#).

Get answers to your carbon capture and storage questions at NETL's [Frequently Asked Questions webpage](#).

ABOUT NETL'S CARBON STORAGE NEWSLETTER

Compiled by the National Energy Technology Laboratory, this newsletter is a monthly summary of public and private sector carbon storage news from around the world. The article titles are links to the full text for those who would like to read more.



National Energy Technology Laboratory

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