Quarterly Newsletter

JULY-SEPTEMBER 2024 WORKFORCE DEVELOPMENT

Welcome

EXCITING MILESTONE!

The Bureau of Economic Geology's Gulf Coast Carbon Center (GCCC) achieved a major step forward in their carbon capture and storage (CCS) efforts. We are now finalizing contracts with our partner universities, setting the stage for increased activities and events. Stay tuned as we gear up to bring even more impactful initiatives to our community!

CONTENT:

TXLA CMC UNIVERSITIES

- Lamar University
- Louisiana State University
- Texas A&M University-Corpus Christi
- Texas A&M University-Kingsville
- The University of Texas at Austin
- University of Houston

This quarter, we highlight potential workforce development opportunities in CCS. As you discuss and incorporate workforce development into your Community Benefit Plans, it is important to inform community members about available opportunities and transferable skills.

If you have any questions for our group regarding CCS, please contact us at txlacmc@beg.utexas.edu. This project is funded for 2024–2026 by Department of Energy's (DOE's) National Energy Technology Laboratory (NETL) project DE-FE32361.

TXLA CMC PHONEBOOK

CONNECT WITH OTHERS INTERESTED IN CCS!

Our phonebook connects you to others in the CCS community, enabling meaningful outreach and collaboration. Please feel free to share our newsletter with anyone interested in joining the directory to foster connections.

Click or Scan

CCUS Workforce Pathways

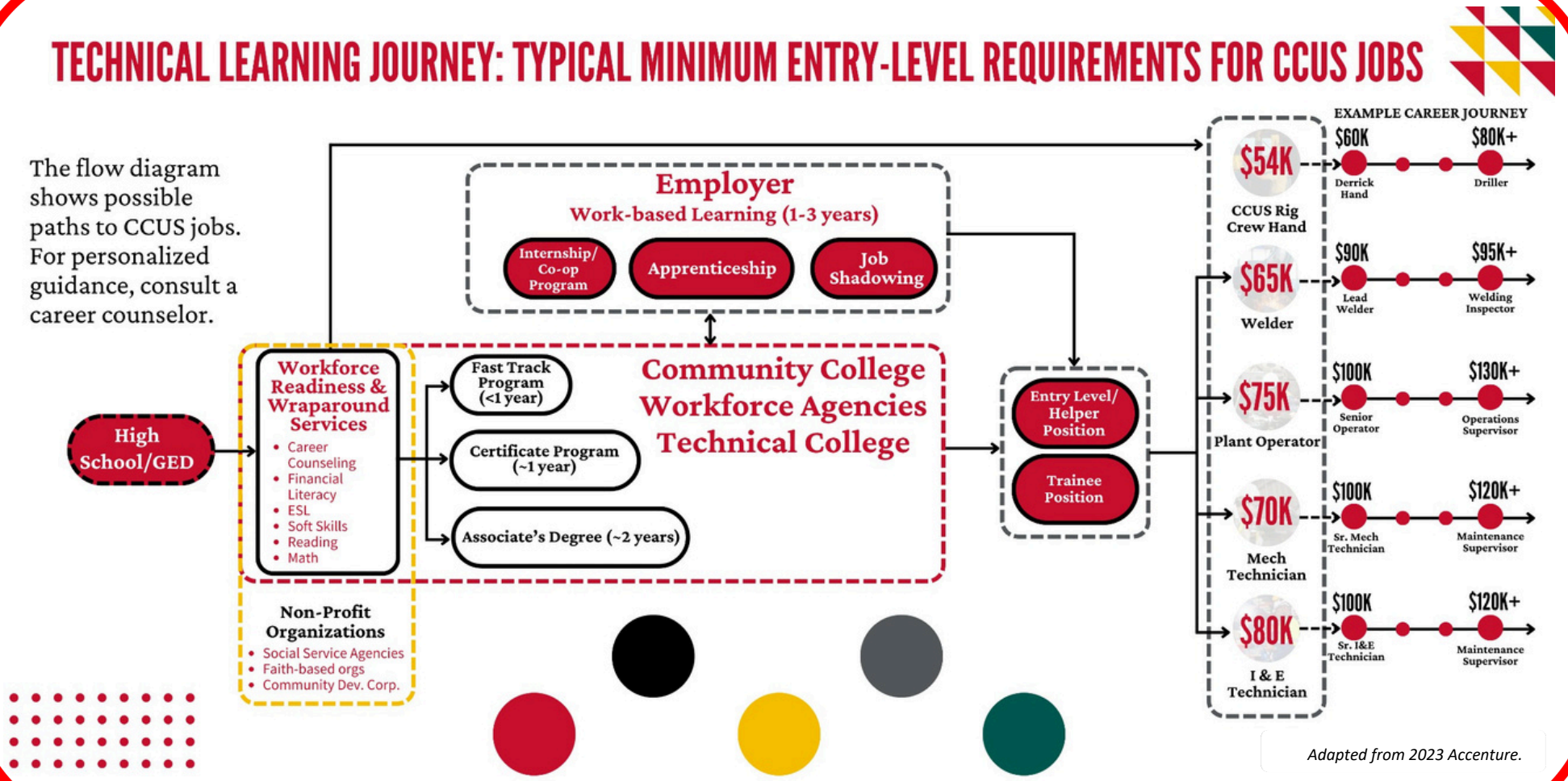


Diagram provided by Dr. Ramanan Krishnamoorti - University of Houston.

As developing technologies and new career paths emerge from energy transition initiatives, career trajectories in the CCUS industry are evolving. While many conventional roles in oil and gas are here to stay, the shift toward a sustainable energy future will require re-skilling and adaptability extending beyond traditional career pathways. Essential skills for this transition include media literacy, business acumen, adaptability, and more. Read more here.

Additionally, see the Greater Houston Partnership's *Mapping Paths to Prosperity* for Houston's Hydrogen Sector, here.

News

SHAPING THE FUTURE: TRAINING TOMORROW'S WORKFORCE IN CCS

ACADEMIC COURSES AND CONTINUING EDUCATION - FALL 2024

Louisiana State University

Dr. Mehdi Zeidouni, with the Craft & Hawkins Department of Petroleum Engineering, is teaching "**Subsurface CO_2 Storage**," a senior/graduate-level CCS course which will cover topics on capacity, containment, and injectivity.

The course incorporates community outreach goals where students can design individualized projects sharing CCS data and impact information with community partners.

The main learning objectives are to:

- Differentiate the mechanism of CO_2 immobilization in the subsurface.
- Model CO_2 flow and interactions with the rock-fluid system, and identify implications for pressure buildup, injectivity, and storage capacity.
- Evaluate storage containment effectiveness considering wells and faults intersecting the storage formation.
- Identify monitoring, verification, and accounting tools required to monitor the storage operation.
- Understand CCS impacts and communicate those impacts with relevant communities.

Lamar University

Dr. Tracy Benson, with the Dan F. Smith Department of Chemical and Biomolecular Engineering, is teaching "**Introduction to CCUS, Environment & Industry, and Why CCUS?**"

This course covers topics of CCUS processes, geologic formations, onshore/offshore storage, risks, realistic expectations, CO_2 utilization, and many topics on absorption and process design.

Texas A&M University-Kingsville

Dr. Jingbo Liu, with the Department of Chemistry, is teaching "**UNIV 1201-008**", an undergraduate Global Studies course which discusses carbon management with a focus on solutions and technologies of carbon capture, sequestration, and conversion.

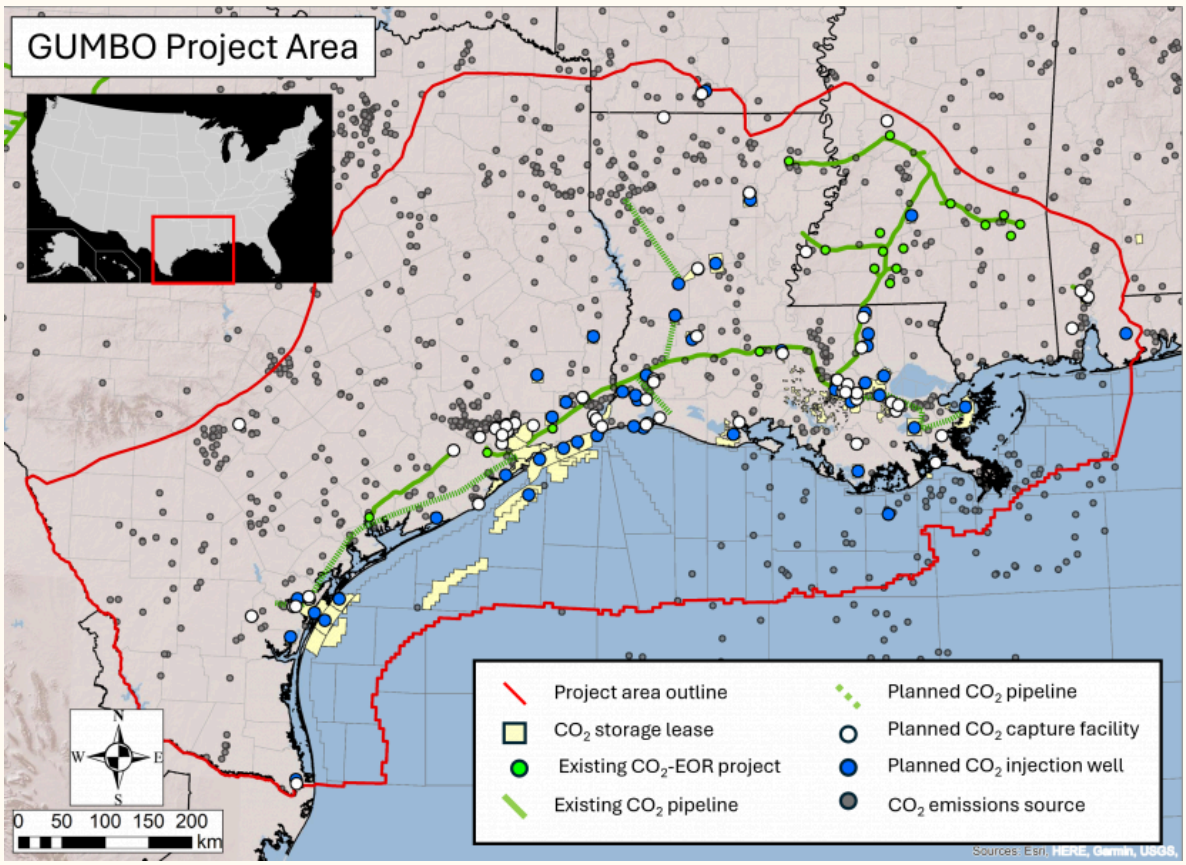
Additionally, she's instructing a graduate course, "**Chemistry and Nanoscience**," on the energy materials needed to foster carbon neutrality.

University of Houston

Dr. Ramanan Krishnamoorti, alongside other UH professors and industry partners, offer an **online executive education** course focused on the technology, economics, and challenges of **Carbon Capture Utilization and Storage** (CCUS). Taught by renowned energy experts, the course explores CCUS's critical role in decarbonization and its impact on industries like oil and gas, power, petrochemicals, and manufacturing.

News

SHAPING THE FUTURE: TRAINING TOMORROW'S WORKFORCE IN CCS



Existing and planned carbon capture and storage infrastructure in the Gulf Coast region. credit: **University of Texas Jackson School of Geosciences**

The DOE's Office of Fossil Energy and Carbon Management has awarded $5 million to a UT-Austin-led research consortium, named **Project GuMBO (Gulf of Mexico Basin Opportunities)**, to advance the CCS industry. Led by **Dr. Alex Bump**, a research associate professor at UT-Austin's Jackson School of Geosciences - Gulf Coast Carbon Center, the project will focus on technical support for subsurface storage, workforce training, and community engagement. With over 50 CCS projects already in development across the region, Project GuMBO aims to help navigate challenges like pressure interference between projects and explore synergies with technologies like geothermal energy and hydrogen production.

The initiative includes partnerships with the **Houston Advanced Research Center, Louisiana State University, Texas A&M University Energy Experiment Center, Texas A&M Kingsville, Los Alamos National Lab, the University of Houston,** as well as a number of community colleges and private companies. A key goal is **training the next generation** of skilled professionals, with plans for both in-person and online programs. The project covers parts of five Gulf states, including Texas and Louisiana, which are already national leaders in CCS development.

Recent Events

SUMMER HIGHLIGHTS: ENGAGING STUDENTS AND EXPANDING HORIZONS

TEXAS A&M UNIVERSITY-KINGSVILLE

Dr. Jingbo Liu, the 2024 recipient of the American Chemical Society (ACS) Energy and Fuels Division Mid-Career Award, attended the **ACS Fall Meeting (Aug 17-22, 2024)**, where the faculty organized Presidential events in elevating chemical enterprise with a focus on carbon separation and conversion. Distinguished professors, researchers, and engineers from academia, DOE national laboratories, and industry presented topics that will be featured in an **upcoming undergraduate course** on the integration of carbon management, with a focus on solutions and technologies for CCUS. The topics included the following:

- Creating a sustainable supply chain using carbon dioxide and water
- Engineering the electrochemically driven capture and conversion of atmospheric CO_2
- CO_2 electrolysis for chemical and food production
- Advances in elevating the chemistry of carbon transformations for closing material cycles towards a sustainable climate, environmental, and energy future
- CO_2, cement, and steel: How new chemical processes could transform some of the largest industrial sources of greenhouse gas emissions to reach net-zero goals
- Coupling waste oxidation with CO_2 reduction in engineered metabolisms

Additionally, there is ongoing research and development from the team on microbial fuel cells study using microbes to mitigate carbon emissions in collaboration with the US Air Force Academy, and green chemistry to produce nanomaterials used in multidisciplinary fields with a focus on battery and fuel cells to support the global mission of net-zero of carbon.

LOUISIANA STATE UNIVERSITY

Dr. Mehdi Zeidouni was a part of hosting a CCS event on the LSU campus to facilitate technical discussions between industry, regulatory, and other stakeholders. The team also took part in public forums addressing local CCS impacts in Louisiana, and is creating research opportunities for undergraduate students through LSU Discover.

PORT ARTHUR CHAMBER OF COMMERCE

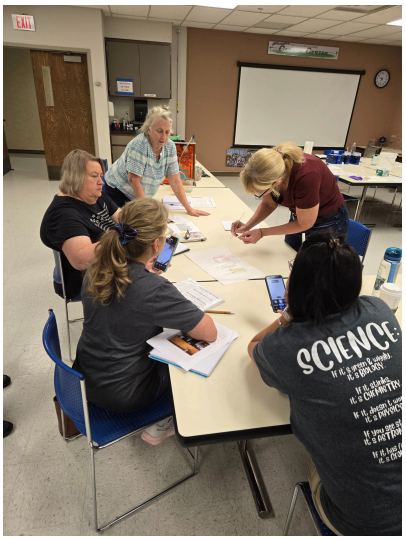
WITH IEAGHG AND GCCC

Dr. Susan Hovorka, Dr. Katherine Romanak, Dr. Tip Meckel, and Angela Luciano with UT-Austin and Dr. Tracy Benson with Lamar University attended the **7th International Workshop on Offshore Geologic CO_2 Storage,** hosted by the Port Arthur Chamber of Commerce and co-organized by the IEAGHG R&D Programme and the BEG's GCCC, to share international CCS expertise at the center of U.S. investments in offshore storage. The workshop brought together stakeholders from industrial, regulatory, policy-making, financial, academic, and other fields. The TXLA CMC team presented ongoing and future projects involved in public engagement. There was widespread acknowledgment of the need to improve public awareness, as preliminary research indicated that more information on CCS could influence public opinion, given the general lack of familiarity with the topic. The conference concluded with a DOE-sponsored field trip to visit the ExxonMobil CO_2 pipeline, followed by a visit to the beach.

Recent Events

SUMMER HIGHLIGHTS: ENGAGING STUDENTS AND EXPANDING HORIZONS

THE UNIVERSITY OF TEXAS AT AUSTIN



This quarter, the Gulf Coast Carbon Center (GCCC) expanded educational outreach through a series of teacher workshops, K-12 youth education, and undergraduate level research training.

CARBON-NOT AMBASSADORS

Three middle school teachers - Cynthia Hopkins from Corpus Christi ISD, Julia Dolive from Fort Bend ISD, and Stephanie Hurst from Cleveland ISD in Texas - gathered at the GCCC to dive into Carbon Capture and Storage (CCS) topics, ranging from the carbon cycle, to project developments in their area, to the basics of monitoring groundwater around storage sites.

Over the course of the workshop, the teachers engaged in hands-on demos, discussions, and experiments about how CO_2 can affect the groundwater in order to develop lesson plans that can align CCS concepts with the Texas Essential Knowledge and Skills (TEKS) standards.

As this initiative expands, these educators, the Carbon-Not Ambassadors, are preparing to share their newfound knowledge with wider audiences, either virtually or in person at CAST24 in San Antonio this November.

Through these efforts, we aim to foster an informed and engaged community, ready to contribute to and understand the environmental solutions of the future.

GEOFORCE

During the week of July 22nd, 2024, around 20 high school students joined Dr. Susan Hovorka at the Gulf Coast Carbon Center for an immersive learning experience focused on CCS. The week kicked off with a ‘CCS Choices' game, illustrating the impact of everyday activities on carbon emissions and exploring various mitigation strategies, including CCS technologies.

Throughout the week, students engaged in hands-on activities, including analyzing well logs, examining core samples, and using tools like EASiTool to estimate CO2 storage capacity. They also took a tour of a post-combustion amine scrubbing pilot plant located at the Bureau of Economic Geology’s Texas Carbon Management Program.

Recent Events

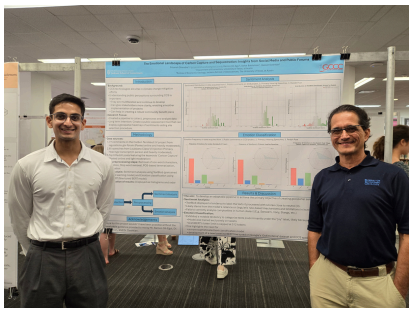
SUMMER HIGHLIGHTS: ENGAGING STUDENTS AND EXPANDING HORIZONS

The week culminated in poster presentations where students showcased their findings on CCS, highlighting real-world applications of the concepts they learned.

This week-long event provided a blend of theoretical knowledge and practical skills, fostering a deeper understanding of CCS and its role in addressing climate change. It was an excellent example of our ongoing educational outreach efforts aimed at empowering the next generation with critical environmental knowledge.

RESEARCH EXPERIENCE TRAINEESHIP (RTX)

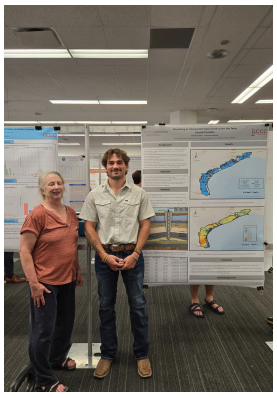
Three undergraduate students, majoring in Economics, Computer Engineering, and Geological Sciences, completed their summer research projects with GCCC and presented their final posters, showcasing how CCS knowledge is being applied across diverse fields. This interdisciplinary approach highlights the potential for individuals from various academic backgrounds to contribute to the CCS industry, broadening the scope of involvement and fostering innovation in carbon management.



Priyansh Dhandha, Economics major at UT-Austin, presented:
"**The Emotional Landscape of Carbon Capture and Sequestration: Insights from Social Media and Public Forums.**"
Priyansh was mentored by Ramon Gil-Egui, Dr. Sahar Bakhshian, and Dr. Hassan Dashtian

Taegon Hibbits, Computer Engineering major at the University of Maryland at College Park, presented:
"**Automated classification of methane super emitters using satellite data.**"
Taegon was mentored by Dr. Hassan Dashtian

Ashtyn Christian, Geology major at TAMU-Kingsville, presented:
"**Visualizing an interpolated USDW base across the Texas Coastal Counties.**"
Ashtyn was mentored by Dr. Susan Hovorka



Recent Events

SUMMER HIGHLIGHTS: ENGAGING STUDENTS AND EXPANDING HORIZONS

LAMAR UNIVERSITY

In August, Dr. Tracy Benson participated in a community meeting to discuss local storage projects and an 18-mile CO_2 pipeline in the region. The discussions revolved around critical issues such as health and safety, emergency response, and the impact on property values. Additionally, his team is working with local project developers to explore monitoring options, with the goal of ensuring real-time public communication regarding any potential issues.

He has additionally led several educational outreach initiatives, teaching K-12 students and teachers about Carbon Capture and Storage (CCS) in the Golden Triangle region —a key area for emerging CCS projects.

Column: Why carbon capture and storage is a win for Jefferson Co.

Click to Read the post from the:

Beaumont Enterprise

Opinion by Tracy Benson, Contributor

It's exciting to see Lamar University's Dr. Tracy Benson share insights on the benefits of CCS for Jefferson County in the *Beaumont Enterprise*. As Dr. Benson highlights, CCS can significantly reduce emissions, bolster the local economy, and create thousands of jobs—all while leveraging Texas' unique geology for safe, permanent CO_2 storage. This kind of thought leadership is exactly what our community needs to stay ahead in the energy transition. Great work, Dr. Benson!

LAMAR INTRO TO ENGINEERING

The Lamar Intro to Engineering (LITE) outreach program engaged around seventy 7th and 8th graders, focusing on promoting STEM careers, especially in chemical engineering. The students participated in various activities using dry ice, candles, and other materials to demonstrate carbon dioxide's properties, such as gas density and chemical reactions.

ChemE CAMP

For the second consecutive year, the ChemE Camp hosted high school students, engaging around 20 participants in plant tours of the Valero Refinery and BASF facilities—two of the largest emitters in the area. Additionally, students enjoyed a field trip along the Neches River, where they explored critical transport routes past the Port of Beaumont.

STEM TEACHER WORKSHOP

The STEM teacher workshop has been held for more than ten years. This year, Dr. Benson engaged in discussions with K-12 educators about the relevance of CCS in today's landscape. His conversations encompassed critical topics such as the energy transition and the integral role that CCS plays within it. He also explored innovative teaching methods, including Reverse Acid-Base Titration, to enhance student understanding of these important concepts.

Upcoming Opportunities

COMMUNITY PUBLIC MEETINGS, CLASS VI IN TEXAS, GHGT-17, CAST24

Climate Now

COMMUNITY PUBLIC MEETINGS

Climate Now, working with the Department of Energy, has organized public meetings for community members in the Beaumont/Port Arthur, Houston Ship Channel, and Galveston/Texas City regions. These meetings will take place in Beaumont, Pasadena, and Texas City, TX, respectively.

There will be an open house for exhibitors between 4:00 pm - 9:00 pm (CST), followed by speakers and panelists aiming to raise knowledge on CCS between 7:00 pm - 8:30 pm (CST).

If you are in this area and are interested in attending, please see descriptions and registration links below.

BEAUMONT/ PORT ARTHUR REGISTRATION	HOUSTON SHIP CHANNEL REGISTRATION	TEXAS CITY/ GALVESTON REGISTRATION
Tue, October 8th **4pm-8:30 pm (CST)** Location: Beaumont Event Centre 700 Crocket Street, **Beaumont**, TX	**Wed, October 9th** **4pm-8:30 pm (CST)** Location: Health and Safety Council 5213 Center St, **Pasadena**, TX	**Thu, October 10th** **4pm-8:30 pm (CST)** Location: Nessler Civic Center 2010 5th Ave N, **Texas City,** TX

Class VI in TX

ECTOR COUNTY PUBLIC COMMENTS

The Environmental Protection Agency is now accepting public comments online for three Class VI injection wells proposed by Oxy Low Carbon Ventures in Ector County, TX. These comments will be due on **October 7th, 2024.**

Additionally, the in-person public comment meeting will be held **October 2nd, 2024** with livestream options available through zoom. Registration links below.

VISIT:

EPA CLASS VI PUBLIC NOTICE

PUBLIC COMMENT MEETING:

Wed, October 2nd, 7 pm - 9:00 pm (CST)
Location: MCM Elegante Hotel
5200 East University Boulevard,
Odessa, TX

ZOOM - OCT 3, 2024 - 11AM-2PM

ZOOM - OCT 3, 2024 - 6PM-9PM

Upcoming Opportunities

Community Public Meetings, Class VI in Texas, GHGT-17, CAST24

Help Us Spread the Word!

Know any science teachers who could benefit having resources that fit learning standards? Share this opportunity! We're providing teachers with valuable resources and industry contacts to enhance their classrooms.

Partner with Us for Community Engagement!

If your project needs community engagement or benefits, our long-term plan is to help **connect you with local teachers** who will learn and teach about CCS in their classrooms. Let's collaborate to bring real-world industry insights into the classroom!

ghgt-17

October 20-24, 2024

CALGARY TELUS CONVENTION CENTRE, AB, CANADA

The **17th Greenhouse Gas Control Technology Conference** (GHGT) is the premier international conference on greenhouse gas reduction technologies.

This year will be the biggest GHGT to date with hundreds of presentations, posters, keynotes, and plenary talks.

GCCC is involved with 14 presentations during this event. Register to learn more information about the latest low-carbon solutions.

GHGT-17 REGISTRATION

November 14-16, 2024

HENRY B. GONZÁLEZ CONVENTION CENTER, SAN ANTONIO, TEXAS

The **Conference for the Advancement of Science Teaching** (CAST) is a must-attend convention for thousands of science educators across Texas.

GCCC will be in attendance to promote education of CCS in K-12 classrooms. See details for our events below:

- **Nov. 14th, 8:00 am, Room 224**
- **Nov. 16th, 9:30 am, Room 224**
- **Nov. 14th - 16th, Booth #831**

Please pass this information to any educators who may be interested in receiving STEM material that fit in with current **Texas Essential Knowledge and Skills (TEKS)** standards.

CAST24 REGISTRATION

Resources/Links

LEARN MORE

ONLINE COURSES

- The **University of Edinburgh** offers a free, self-paced online course that explores carbon capture and storage (CCS) technologies and their crucial role in climate mitigation. Click below for more details.
  https://www.onlinecourses.ed.ac.uk/all-courses/climate-change-carbon-capture-and-storage-english-edx
- The **University of Houston** offers a self-paced online executive education course on Carbon Capture, Utilization, and Storage (CCUS), featuring live meetings and networking opportunities. The course covers the technology, economics, and challenges of CCUS. Click below for more details.
  https://uh.edu/uh-energy-innovation/uh-energy/educational-programs/micro-credentialing/ccus-executive-education/

REPORTS AND FACT SHEETS

- The **University of Houston**'s white paper explores how Houston can redefine itself as a clean energy leader while ensuring its workforce—especially from disadvantaged communities—has the skills needed for the emerging energy ecosystem. Click below to read more about the analysis.
  https://uh.edu/uh-energy-innovation/uh-energy/energy-research/white-papers/white-paper-files/white-paper-2024-workforce-dev.pdf
- The Regional Deployment Initiative with the **Great Plains Institute** has released **Jobs and Growth Fact Sheets** based on analysis by the Rhodum Group. Discover more below alongside details for TX and LA.
  https://carboncaptureready.betterenergy.org/analysis/
  - Texas - Factsheet
  - Louisiana - Factsheet

Questions/Comments

REACH US AT THE GULF COAST CARBON CENTER - BUREAU OF ECONOMIC GEOLOGY

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LEAVE A COMMENT!

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