



*National Association of  
State Energy Officials*

# NASEO Webinar: Advancing a CO<sub>2</sub> Transport Network in the United States



November 7, 2024

Thank you to the U.S. Department of Energy Office of Fossil Energy and Carbon Management for their support of this event.

# Welcome and Logistics

---

Kelsey Jones, Program Director, NASEO

# Speakers

- Robert Smith, Carbon Transport Program Manager, Office of Fossil Energy and Carbon Management, U.S. Department of Energy
- Ryan Kammer, Research Manager, Carbon Management, Great Plains Institute
- Nicolas Medina, Public and Stakeholder Engagement Manager, ExxonMobil Pipeline Company



U.S. DEPARTMENT OF  
**ENERGY**

Fossil Energy and  
Carbon Management

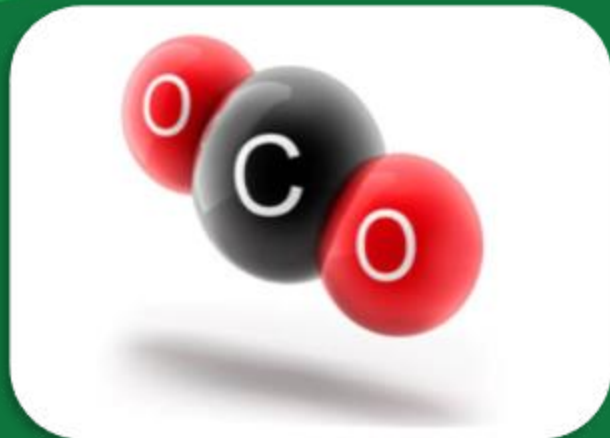
# DOE/FECM Carbon Transport Program Activities and Perspective

NASEO Webinar: Advancing a CO<sub>2</sub> Transport Network in the United States

---

**Robert Smith**

*Carbon Transport and Storage (CTS) Division  
Office of Fossil Energy and Carbon Management*



## Disclaimer:

“The following DOE-FECM PowerPoint presentations were created for the *NASEO Webinar: Advancing a CO2 Transport Network in the United States.*”

Neither the U.S. Government nor DOE, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

References herein to any specific commercial product, process, or services by trade name, trademark, manufacturer, or otherwise, do not constitute or imply its endorsement, recommendation, or favoring by the U.S. Government or DOE or its contractors or subcontractors.”

# Key Messages

## Carbon Management Technology...



...works and is essential for meeting climate goals.



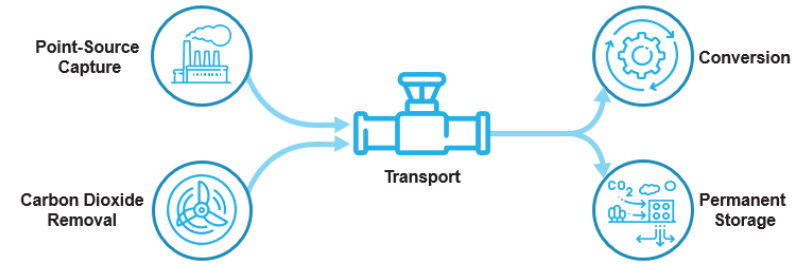
...is ready for commercial liftoff in the U.S. after recent policy advances.



...requires more policy, private investment, and collaboration to unlock its full potential.



# CO<sub>2</sub> Transport Must Expand Rapidly



**Today**

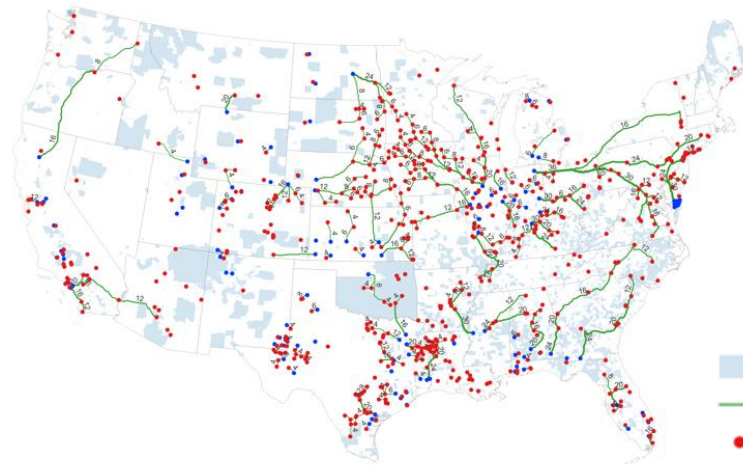
**2030**

**2050**



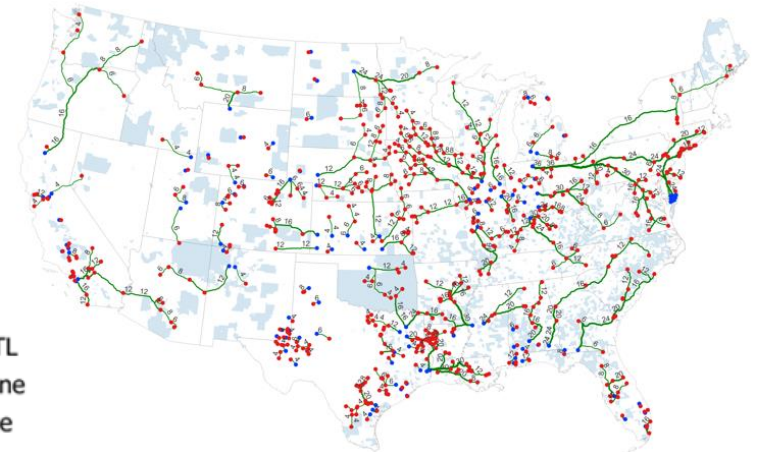
Existing CO<sub>2</sub> Pipeline Mileage (2024)

**5,500+ miles of pipelines**



Modeling from Los Alamos National Laboratory (2024)

**19,892+ miles of pipelines**



Modeling from Los Alamos National Laboratory (2024)

**27,438 + miles of pipelines**

A network of rail, truck and ship/barge transport with intermodal hubs must also expand in addition to pipelines

# Carbon Transport Challenges

- Safety/environmental oversight requirements & standards
- Federal/state project siting/permitting
- Securing land easements for new construction
- CO<sub>2</sub> quality for modal transportation specification
- Technical, integrity and emergency response
- Custody transfer metering & 45Q
- Modal cost optimization via techno-economic analysis & life cycle assessment



Source: Network Dispatches



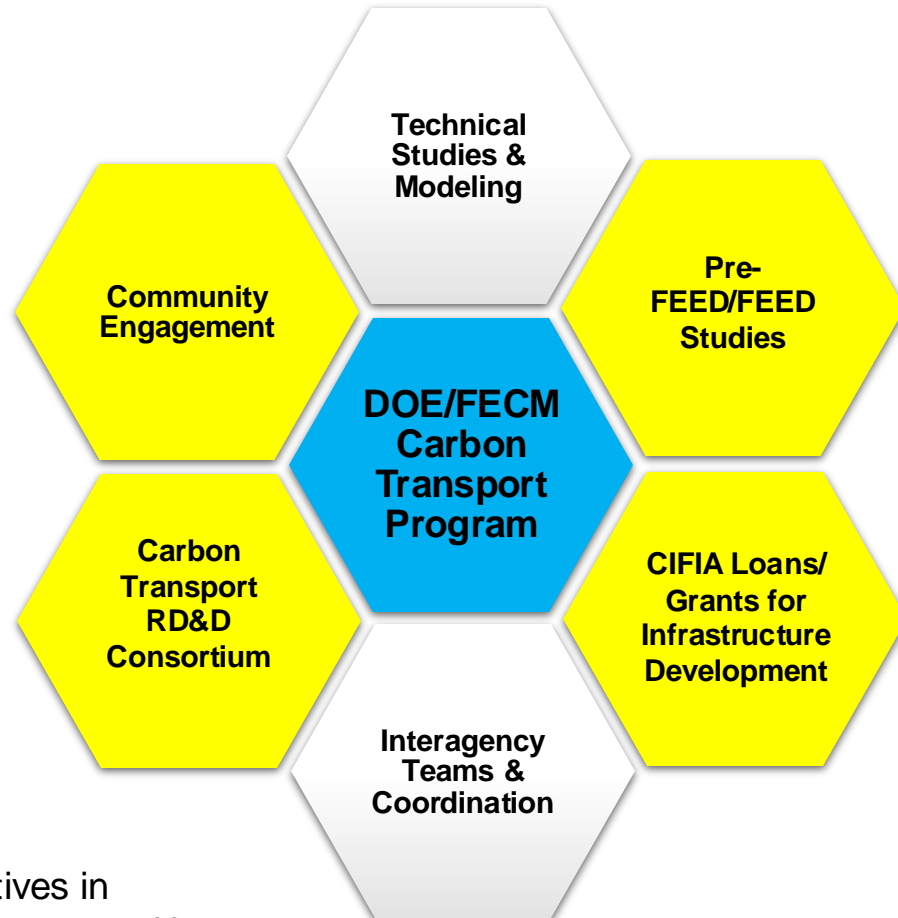
Source: NAP



Source: Catalyst Today, Vol 410.



# Carbon Transport Initiatives



■ Initiatives in yellow covered in next few slides



## Transport Initiatives can Enable Solutions

- Coordinate project developments
- Nurture government policy synergies
- Remove technical barriers
- Transfer research outputs into outcomes
- Accurately inform communities
- Quantify emissions profile
- Optimize costs and routing
- Mature project readiness
- Improve NEPA preparedness
- Finance infrastructure development

# Community Benefits

## Projects are required to provide:

To achieve the greatest impact for all Americans with this once-in-a-generation investment in infrastructure, it is critical that BIL-funded projects invest in America’s workforce, mitigate new impacts, and deliver tangible and measurable benefits to impacted communities. Projects that fail to do this may fail to gain social support and may in turn decrease support for future projects.

**To ensure projects offer opportunities, maximize benefits, and minimize negative impacts, projects must include a Community Benefits Plan, which includes:**



# Transport Pre-FEED/FEED Studies

## Pre-FEED Study Objective:

To support advancements in infrastructure engineering and early conceptual designs needed for large-scale transport projects.

Up to 12 months  
& \$800K

## FEED Study Objective:

Accelerate the planning and development of CO<sub>2</sub> transportation infrastructure by a variety of modes, such as through rail, trucks, ships, and pipelines.

Up to 24 months  
& \$6M

## Front-End Engineering Design for CO<sub>2</sub> Transport

### FEED Scope:

- **Engineering and Design Package**
  - Route report and map (i.e., wetlands and environmental)
- **Design basis document**
- **Critical safety and risk assessments**
  - Air dispersion and potential impact radius study, Emergency Response Plan, and redundant safety design
- **Environment, Safety & Health and Regulatory Plan analysis**
- **Community Benefits Plan**
- **Cost and Business Case**



# Transport Pre-FEED/FEED Studies

Study Type	Mode/Project Type	Project General Location(s)	*Contingent Transport Capacity (MMTPA)
Pre-FEED	Multimodal Hub	OH/PA/WV	3.4+
Pre-FEED	Multimodal Hub	Tampa Bay area, FL	2+
FEED	Pipeline	WY	25
FEED	Pipeline	LA/TX	250
FEED	Pipeline	WY/SD/MT	60
FEED	Barge	OR/WA/CA	1+
FEED	Barge	FL/LA	1+
FEED	Barge	AL/MS/LA	2+

\*Values are approximated based on preliminary findings and subject to change

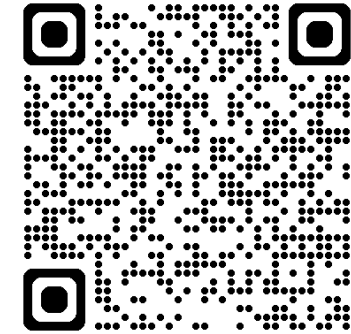
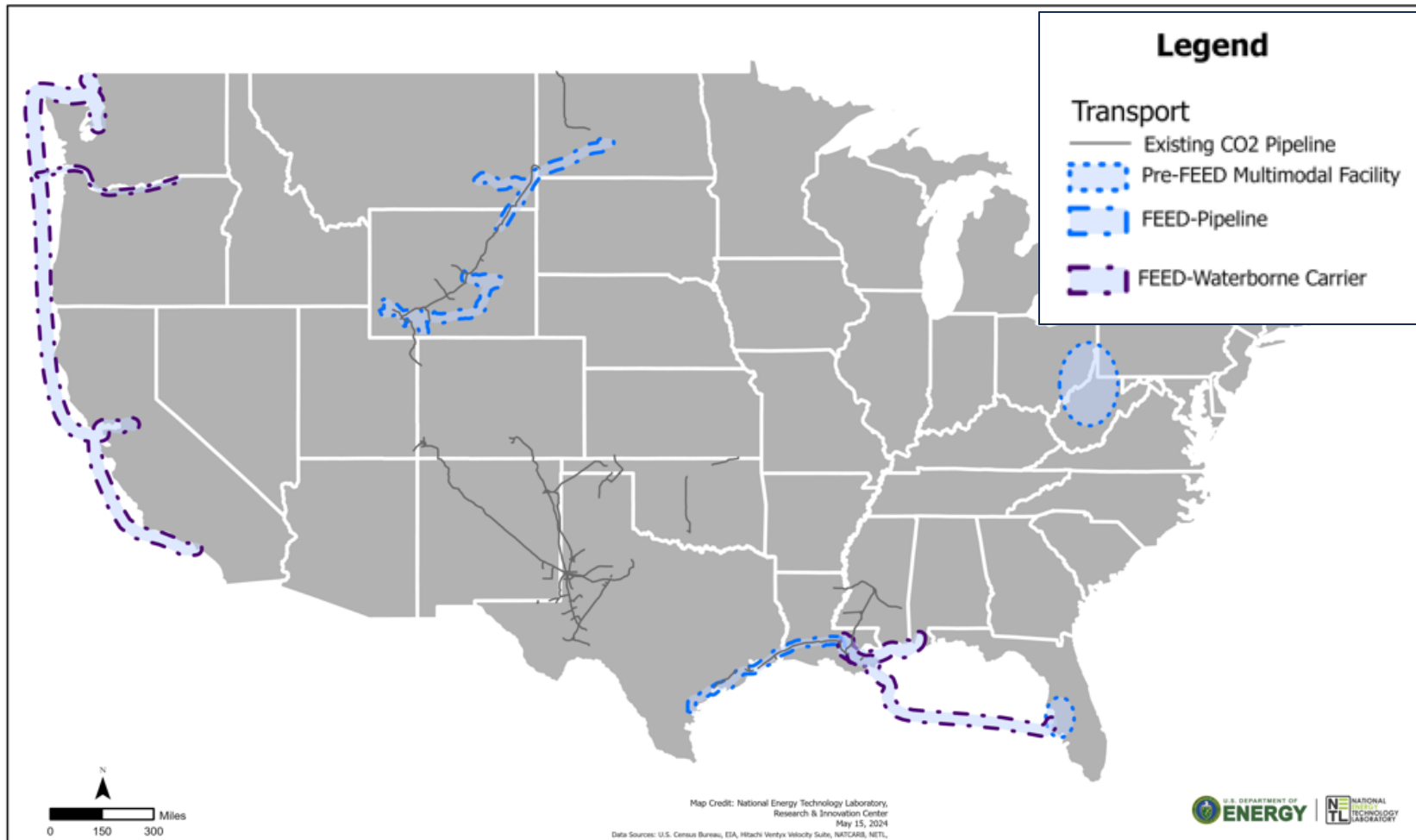
NOTE: The plus sign (+) means potentially scalable

MMTPA: Million Metric Tonnes per Annum

**Total: 344.4+ MMTPA**



# Transport Pre-FEED/FEED Studies



Scan QR-Code to visit the Carbon Management Projects (CONNECT) Toolkit and map where all DOE/FECM funded projects will be displayed.

<https://www.energy.gov/fecm/connect-toolkit-beta>

# CO<sub>2</sub> Transportation Infrastructure Finance & Innovation Program of Loans & Grants

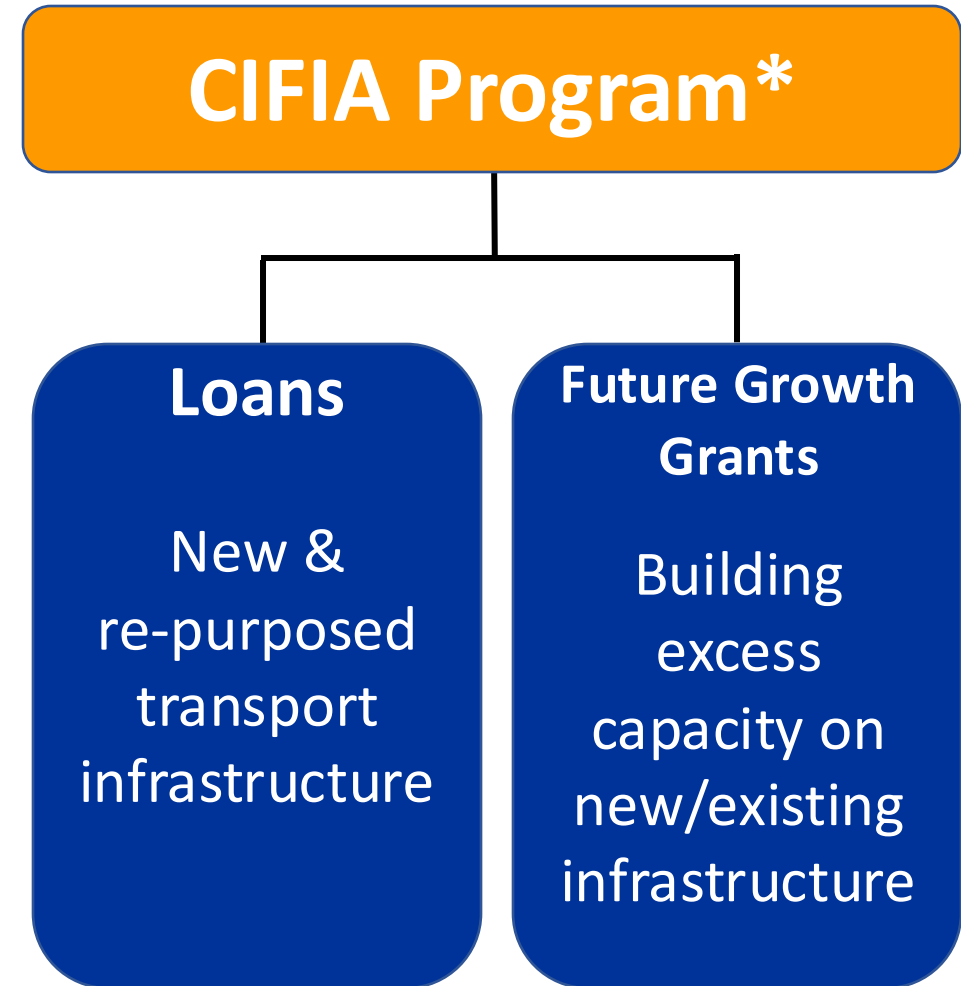
**BIL Funding:** \$2.1B with credit subsidy of approx. \$20B

**Objective:** Offers access to capital for large-capacity, common-carrier CO<sub>2</sub> transport infrastructure projects to transport CO<sub>2</sub> from points of capture to conversion facilities and/or storage wells.

**Transport Modes:** Pipeline, rail, truck, ship & barge



\*CIFIA funding of up to 80% of project costs



# Some CIFIA Program Key Eligibility Requirements

- Is a common carrier CO2 transportation infrastructure project in the United States, with total project costs greater than \$100 million, that will transport CO2 captured from anthropogenic sources and/or ambient air by pipeline, shipping, rail, or other transportation infrastructure for storage or use.
- Can attract public and/or private investment to fund Project costs not covered by the CIFIA Loan, as evidenced by binding commitments and/or expressions of interest from other potential funders.
- Will publish a publicly available tariff with just and reasonable rates, terms, and conditions for nondiscriminatory CO2 transportation service.

NOTE: See “CIFIA Program Guide” for the full list of requirements



U.S. DEPARTMENT OF  
**ENERGY**

Fossil Energy and  
Carbon Management



[Click here to visit the CIFIA  
Program webpage](#)

# CIFIA Future Growth Grant Eligibility Requirements

Future Growth Grant (FGG) FOA now issued! LPO also posts revised CIFIA Program Guide on CIFIA Program Website

**In General:** A FGG application must meet CIFIA program eligibility requirements of a base project, and additional requirements stated in the FOA. Grant applications will follow a similar process of an LOI and Application as described in the FOA.

Funding Opportunity Announcement (FOA) Number: DE-FOA-0002966

FOA Type: **Amendment 000003**

Assistance Listing Number: 81.089, Fossil Energy Research and Development

FOA Amendment 000003 Issue Date:	08/28/2024
Submission deadline for Letter of Interest:	08/15/2024 5:00pm ET
Submission Deadline for Full Applications:	10/30/2024 5:00pm ET
Expected Date for DOE Selection Notifications:	February 2025
Expected Timeframe for Award Negotiations:	March to July 2025



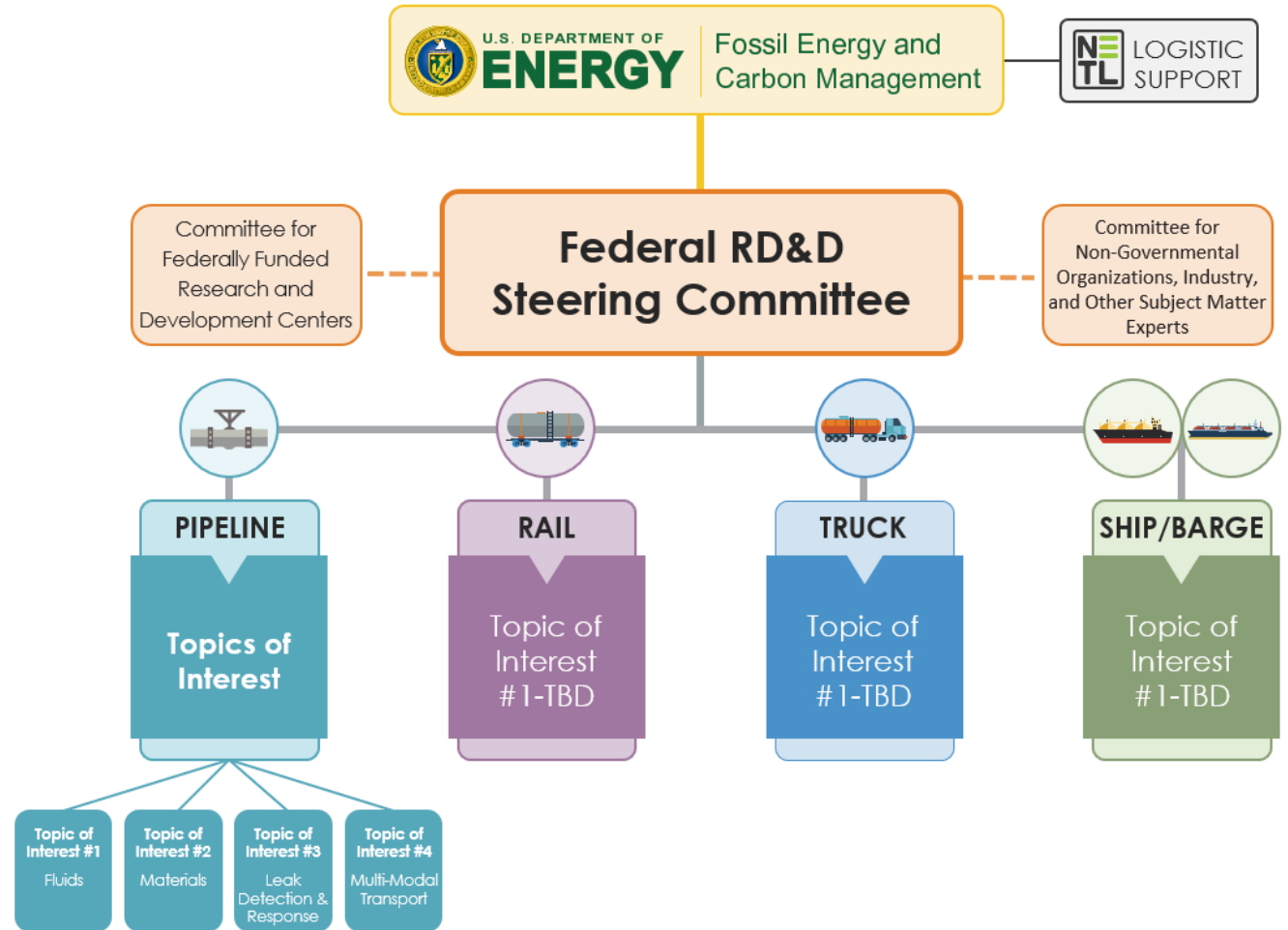
Source: Virginia Mercury





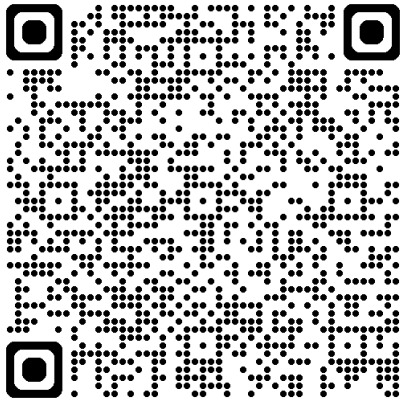
# Consortium Benefits & Structure

1. Awareness of RD&D activities
2. Leveraging collaboration and costs
3. Increased credibility
4. Improve chances to achieve goals
5. Growing network of knowledge
  - Increased access to experts
  - Increased access to organizations
  - Increased access to peer reviewed knowledge
  - Increased access to multi/intermodal transport companies



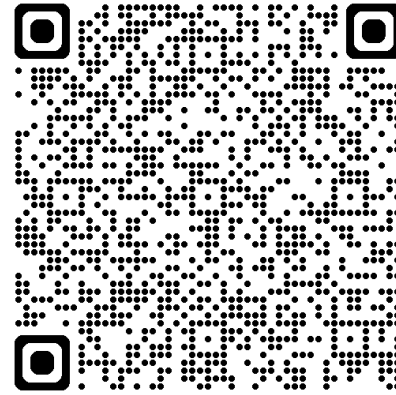
# Transport Funding/Other Opportunities

## Pre-Front-End Engineering Design Studies



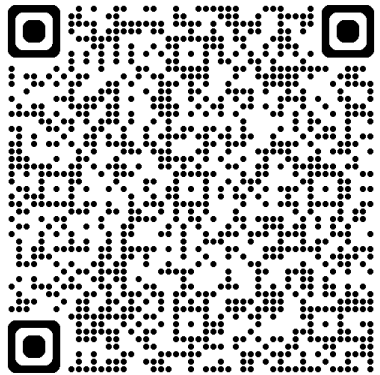
<https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%3fdoc%3dDE-FOA-0002614%26agency%3dDOE&doc=DE-FOA-0002614&agency=DOE>

## Front-End Engineering Design Studies



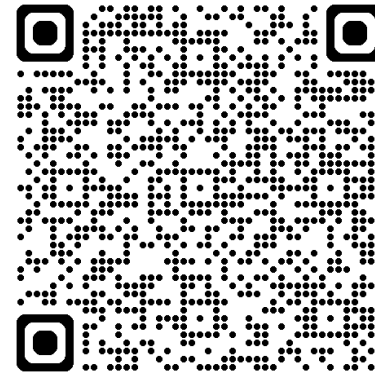
<https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%3fdoc%3dDE-FOA-0002730%26agency%3dDOE&doc=DE-FOA-0002730&agency=DOE>

## Loans/Grants for Infrastructure Construction



<https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%2f%3fdoc%3dDE-FOA-0002966%26agency%3dDOE&doc=DE-FOA-0002966&agency=DOE>

## Research, Development & Demonstration Consortium



<https://www.energy.gov/fecm/request-information-carbon-transport-research-development-demonstration-consortium>

# Thank You!



U.S. DEPARTMENT OF  
**ENERGY**

Fossil Energy and  
Carbon Management

<https://www.energy.gov/fe/office-fossil-energy>

*Sign up to receive DOE FECM's email updates [here](#).*

**Amanda Raddatz Bopp**

Director, Carbon Transport & Storage Division

Email: [amanda.raddatzbopp@hq.doe.gov](mailto:amanda.raddatzbopp@hq.doe.gov)

**Robert Smith**

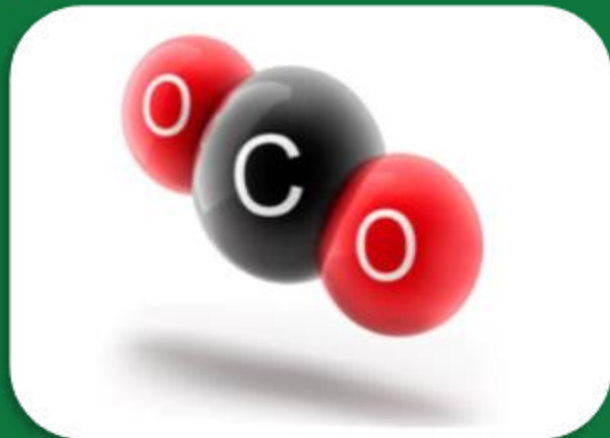
Program Manager – CIFIA

Email: [robert.smith8@hq.doe.gov](mailto:robert.smith8@hq.doe.gov)

**Kevin Dooley**

Program Manager – FEED Studies

Email: [kevin.dooley@hq.doe.gov](mailto:kevin.dooley@hq.doe.gov)



# CO<sub>2</sub> Pipeline Safety and State Considerations

Ryan Kammer

11/7/2024



**GREAT PLAINS  
INSTITUTE**

Better Energy.  
Better World.

# Background on GPI

## Overview and Mission

- Independent nongovernmental organization focused on energy policy and technology.
- Goal is to transform the energy system to benefit the economy and the environment.

## Objectives

- Increase energy efficiency and productivity.
- Decarbonize electricity production.
- Electrify the economy and adopt zero and low-carbon fuels.
- Capture carbon for beneficial use and permanent storage.



**GREAT PLAINS  
INSTITUTE**

Better Energy.  
Better World.

# Great Plains Institute: Leading Federal and State Initiatives in Carbon Management and Industrial Decarbonization



**CARBON CAPTURE  
COALITION**

**STATE  
CARBON  
CAPTURE  
WORK  
GROUP**



**Carbon Action  
Alliance**

**REGIONAL  
CARBON  
CAPTURE  
DEPLOYMENT  
INITIATIVE**



**Industrial  
Innovation  
Initiative**

a partnership between Great Plains Institute and  
World Resources Institute

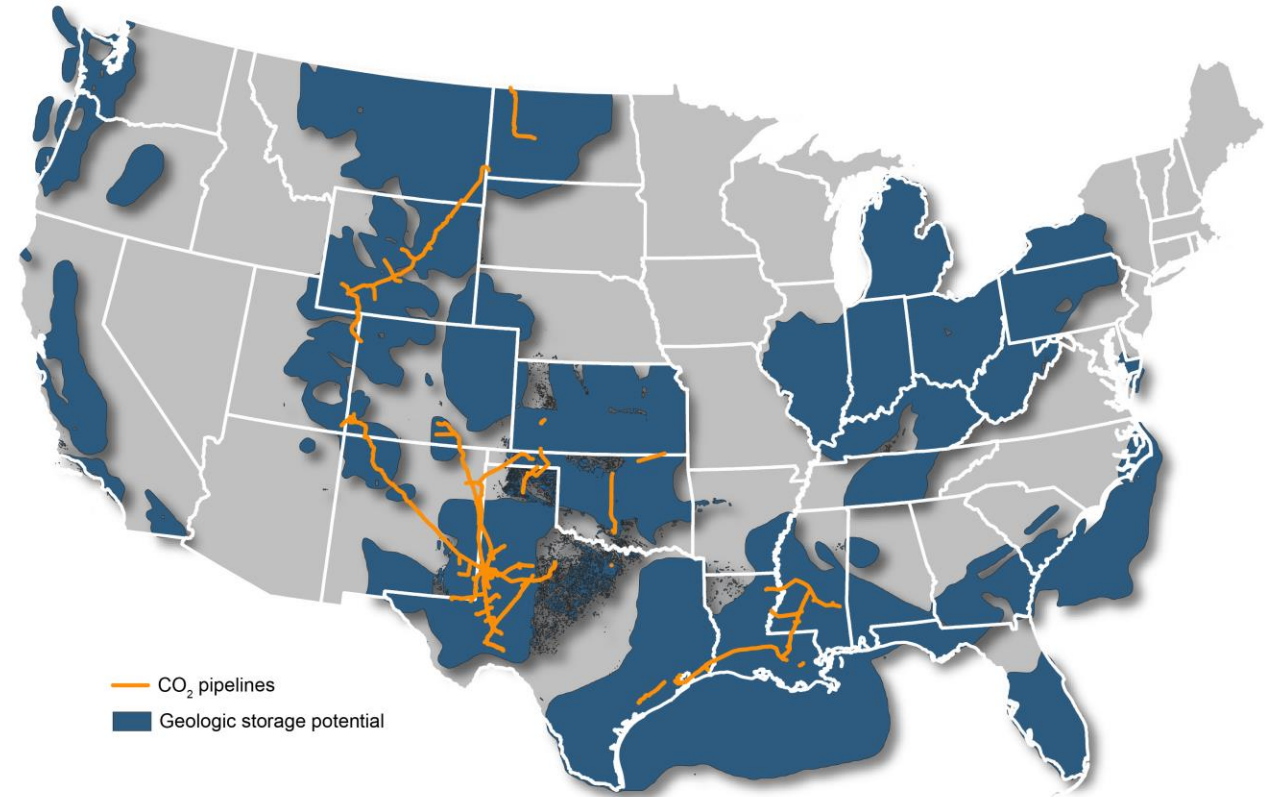
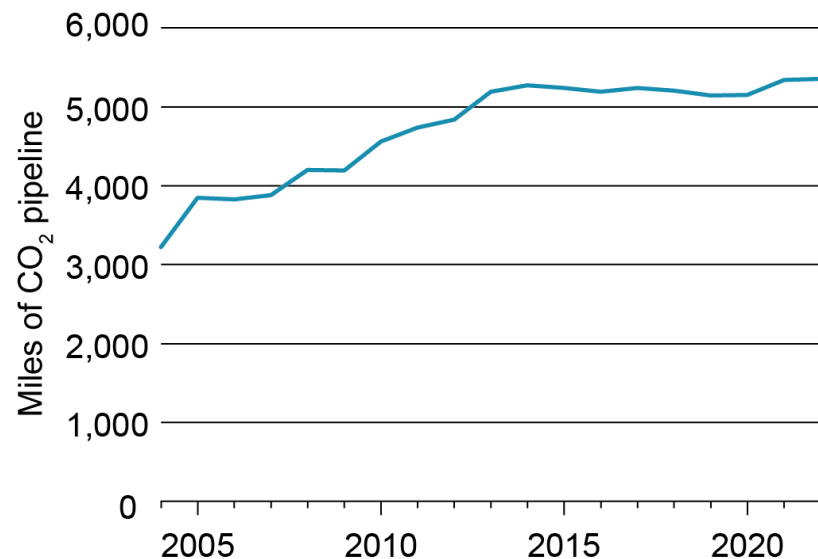


**GREAT PLAINS  
INSTITUTE**

Better Energy.  
Better World.

# Historical and current use of CO<sub>2</sub> pipelines in the United States

- First large-scale CO<sub>2</sub> pipeline in the 1970s.
- Roughly 5,300 miles of CO<sub>2</sub> pipeline in operation in 2024.



# State's role in safety oversight and siting

## Safety Oversight

- Federal oversight through the Pipeline and Hazardous Materials Safety Administration (PHMSA)
  - Includes construction, operation, and maintenance
  - CO<sub>2</sub> regulated under 49 CFR Part 195 and includes pipelines that transport CO<sub>2</sub> in the supercritical state
- States can participate in agreements with PHMSA that allow them to assume authority over intrastate pipelines, or act as agents on behalf of PHMSA for interstate pipelines
  - Must have standards as stringent as PHMSA to obtain intrastate oversight
- PHMSA offers grants for states or other organizations within a state to enhance emergency response capabilities

## Siting

- No federal siting authority for CO<sub>2</sub> pipelines
- Many states do not explicitly address the siting of CO<sub>2</sub> pipelines
- Siting authority varies by state from local or county-level jurisdictions to state-level boards or commissions
- Use of eminent domain not consistent
- Some states (e.g., Illinois, California) have placed a moratorium on CO<sub>2</sub> pipeline operation until updated rulemaking from PHMSA

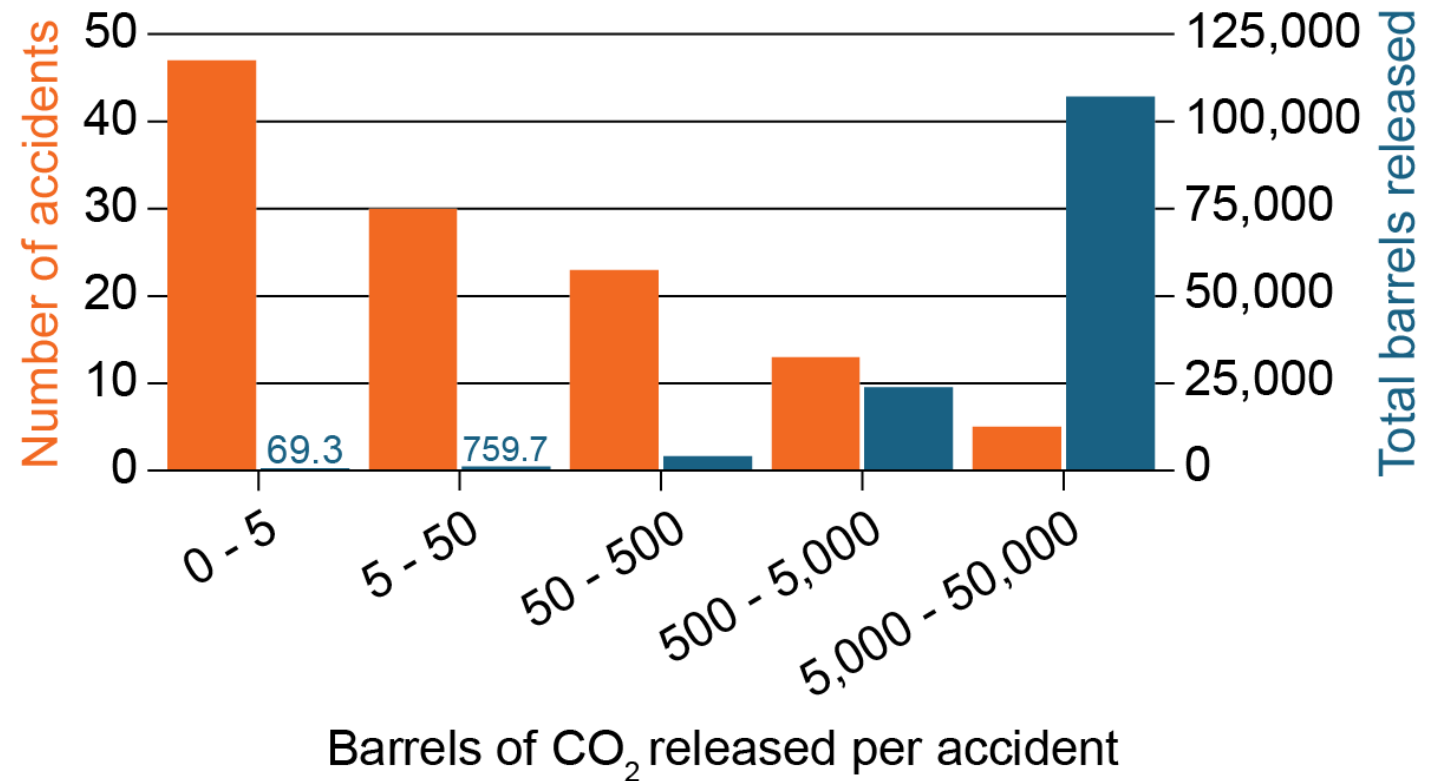




# Pipeline Safety

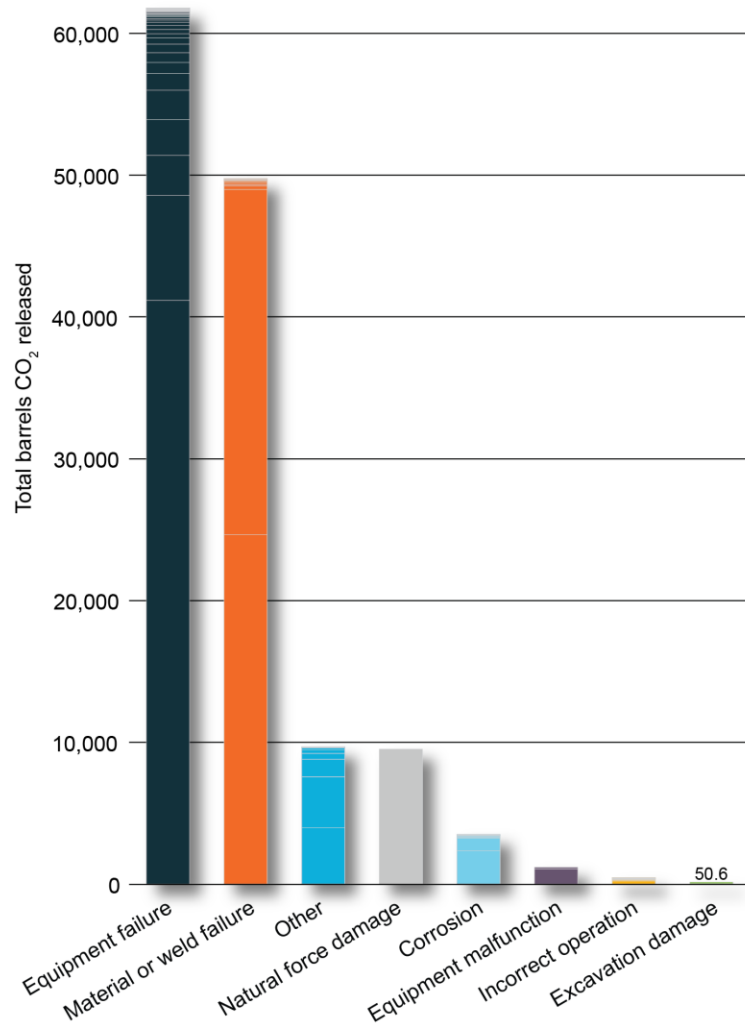
## Volume unintentionally released

- 123 accidents reported between 1994 and 2023
  - 5 accidents did not have a volume reported.
- Most accidents involved less than 5 barrels of unintentionally released CO<sub>2</sub>, while most of the volume released is from the five largest releases.



# Pipeline Safety

## Cause of releases



- Equipment failures may include failures of valves, O-rings, gaskets, or seals.
- Material/weld failures are typically cracks that are a few inches long, but some required up to 70 feet of pipe being replaced.
- Notably, corrosion has not been one of the major causes of accidents or total volume unintentionally released.
- PHMSA began separating intentional and unintentional volume released in 2010.
  - Since then, 278,000 barrels have been intentionally released.
  - Intentional releases are typically required to lower the pressure of the pipeline so the issue can be fixed.
    - Intentional releases are done in a controlled manner that does not pose a risk to the public or the environment.



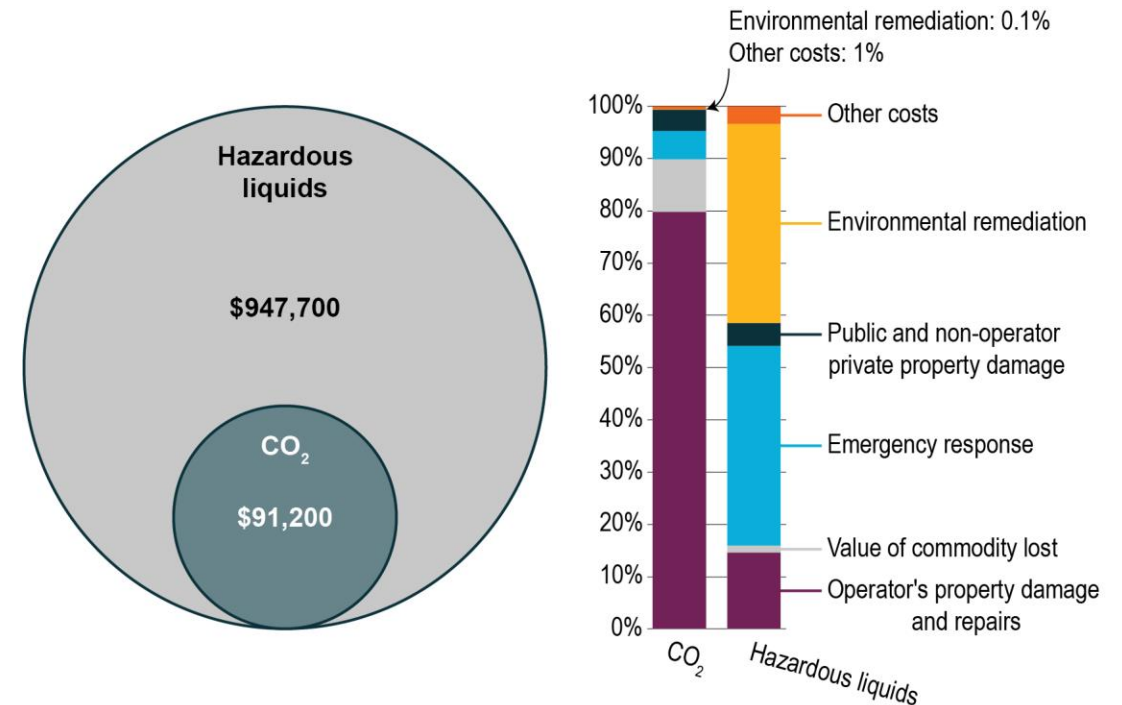
# Pipeline Safety

## Other considerations

### High consequence areas (HCAs)

- Identified at various stages of a pipeline's development and operation.
- Include additional safety and reporting requirements and are part of an operator's integrity management program.
- Over the past ten years, an average of 565 miles of CO<sub>2</sub> pipeline identified as able to affect an HCA.
  - Ten accidents over that time that affected an HCA, 7 had been identified as capable of doing such.
  - Four accidents on sections that could have affected an HCA, but the CO<sub>2</sub> did not reach the HCA.

### Personal and property damage of accidents



- One reportable injury (excavating contractor), no fatalities.

# Satartia

- Occurred near Satartia, MS, in February 2020.
- Rupture caused by axial strain on the pipeline from soil movement due to heavy rains over a sustained period.
- Released roughly 30,000 barrels of CO<sub>2</sub>
- PHMSA reported approximately 200 people evacuated, with 45 seeking medical attention.



Aerial photo of pipeline rupture, Satartia, MS. From PHMSA's Failure Investigation Report – Denbury Gulf Coast Pipeline.

# PHMSA rulemaking

- In response to the incident at Satartia, PHMSA initiated a new rulemaking, issued an advisory bulletin related to geohazards and pipelines, solicited new research funding, and issued a notice of probable violation to the operator.
- PHMSA submitted a Notice of Proposed Rulemaking on February 1, 2024, which is expected to be publicly released soon.

# RP 1185 Public Engagement Tactics for CO<sub>2</sub> Pipelines / CCS Deployment

Nick Medina

Public & Stakeholder Engagement Manager, ExxonMobil Pipeline Company, LLC

# RP 1185: Pipeline Public Engagement

## CORE PRINCIPLES



### OPENNESS AND TRANSPARENCY

Frank discussion, sharing of truthful, timely, and relevant information, and willingness to listen and learn and nurturing an environment of transparency.



### INCLUSIVENESS

A deliberate effort to involve parties interested in the subject or action.



### RESPECT

Considering and respecting others' points of view by listening to questions, understanding concerns, and allowing each other to share perspectives.



### ACCESSIBILITY

Commitment to provide a variety of methods and opportunities for all interested stakeholders to participate.



### RECIPROCITY

Communication and action for mutual benefit, listening as well as speaking, being responsive to inquiries and interests, and sharing responsibility for interactions and relationships.



### EQUITY

Deliberation and decision-making that take into account the needs, circumstances, and resources of all stakeholders.

# Company-Wide Commitment

Educating, advocating and engaging with the public is established as a key business initiative

## 2024 EMPCo/AMFO Must Wins

Our goal is to be the provider of choice, delivering industry leading midstream solutions across all value chains and to support society's ambition for a lower-emission future.

### Amplify our voice: Educate, advocate, engage

- Engage with first responders across region
- Strategically position EMPCo/AMFO branding
- Leverage trades, R&D groups and academia



ExxonMobil

Pipeline

Imperial

Denbury

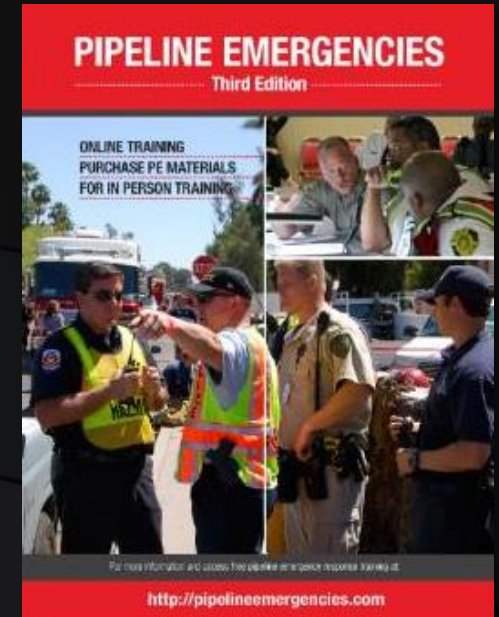


# API RP 1185 Key Tactics

1. Train & Engage with First Responders
2. Educate via STEM Camps
3. Engage with 3Ps/Diverse Groups

# Tactic 1: Train and Engage with First Responders

- 850+ firefighters, representing 200+ fire departments, trained
- CCS/CO<sub>2</sub> module incorporated in 1Q2023
  - Integrated API-LEPA-NASFM ER guide on how to plan, prepare and respond to CO<sub>2</sub> releases
- 17 Sessions Completed
  - Quarterly sessions in 2024-25
  - Targeting TX, LA, MS
- Additional outreach in 2024
  - Expanding to Denbury routes
  - NASFM mobile training unit



ExxonMobil

Pipeline

CO<sub>2</sub>

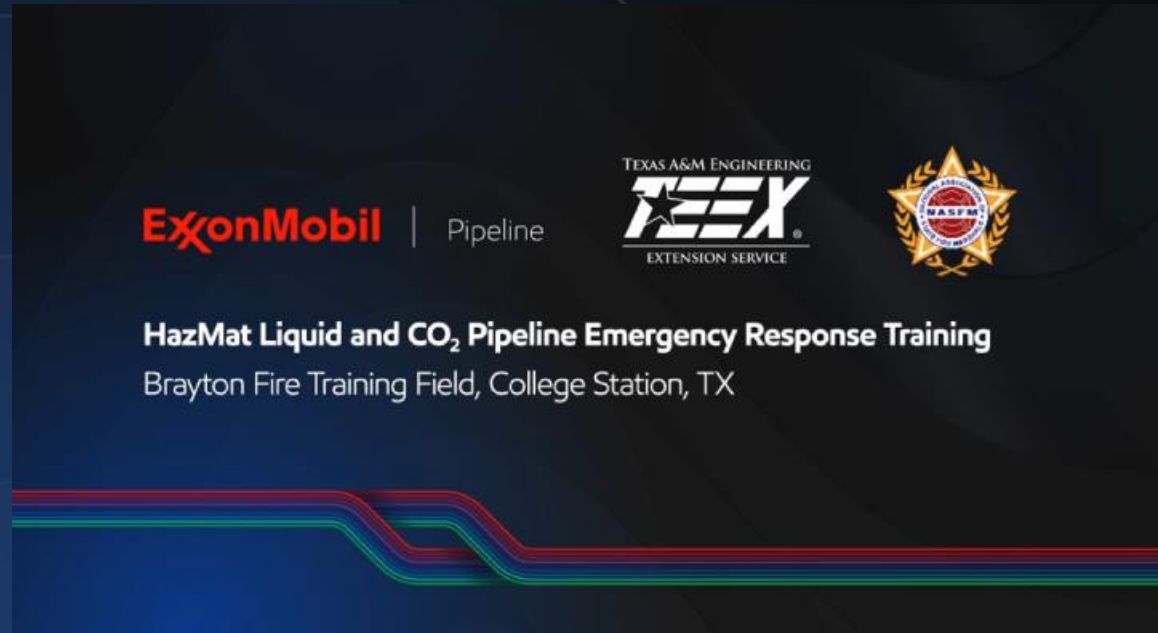
Carbon Dioxide

Preparedness Guide & Training



## *Tactic 1*

# Train & Engage with First Responders



<https://vimeo.com/user184185293>

# Tactic 1

## Social Media Extensions

**National Association of State Fire Marshals** is at **TEEX Brayton Fire Drill Field - Texas A&M**.  
 22h · College Station · 🌐

ExxonMobil, TEEEX and NASFM working together to train first responders on responding to pipeline and industrial incidents. Leading from the front and raising the bar.

7 1 share

**Chris DellaFranco** · 3rd+  
 Refinery Operations Manager  
 2h · 🌐

"Humility is not thinking less of yourself; it is thinking of yourself less. Humility is thinking more of others."

Fighting fires is a truly humbling experience. However to me it is the sacrifice of these courageous volunteers to put themselves first in the face of danger is what is true humility and courage.

I got to spend time with our **ExxonMobil Baton Rouge** volunteer firefighters at Corporate Fire Training at **#TEEX** in **#CollegeStation** for this world class training. It was a humbling experience and should remind us of how important the work they do is for the safety of our facilities. It was also special that this training was the week of September 11th **#NeverForget**

Thank you for all you do and the sacrifices you make.

26 1 comment · 1 repost

**James E. LeBlanc**  
 1d · 🌐

Day 1 at Texas AM Fire School with **St. Amant Volunteer Fire Department** and **5th Ward Vol. Fire Dept. - Ascension, La.** Thank you ExxonMobil for paying for our Ascension Parish Volunteer Firefighters to attend one of the best fire schools in the US. The entire weekend is dedicated to the proper response of pipeline emergencies. **Randy Haddad, Derek James LeBlanc, Hunter Solar, Mytrail Whitehead, Dina Holubar, Jaclyn Rhodes Collins, John Diez, John J Collins, Eric Hughes, Robbie V...** See more

+33

You, James E. LeBlanc and 46 others 8 comments

# Tactic 1

## Train & Engage with First Responders

### Key Coverage

**TEEX:** [Hear from Harris County Commissioner Adrian Garcia on TEEX Training](#) – Harris County Commissioner Adrian Garcia attended the April 2024 ExxonMobil-sponsored HazMat Liquid & CO<sub>2</sub> Pipeline and Industrial Fire Emergencies training at TEEX in College Station, Texas. [Click here](#) to read Adrian Garcia's full remarks.



Dan Ammann · 3rd+

President Low Carbon Solutions at ...

2h · 🌐

+ Follow ✦ ...

We're serious about pipeline safety.

That's why after expanding our CO<sub>2</sub> pipeline network, we've added CO<sub>2</sub> pipelines to the emergency response training we operate in conjunction with the [Texas A&M Engineering Extension Service - TEEX](#). This program has helped train hundreds of firefighters with hands-on, live simulations.

Because while we design and operate our facilities with the goal of preventing incidents from happening, if they do occur, first responders need to be prepared.

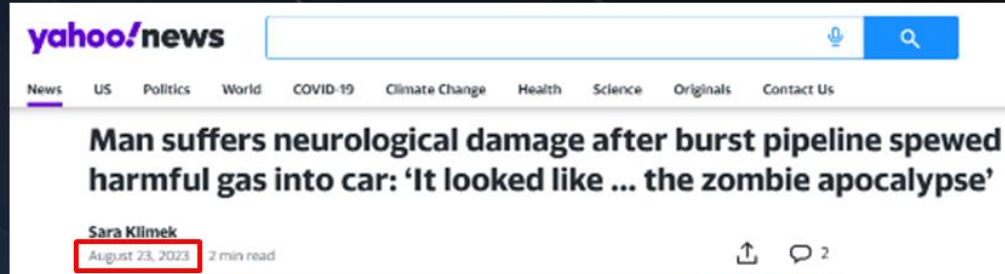
Read more about the training here: <https://lnkd.in/dNQZPHR>

[#Carboncapture](#) [#energytransition](#) [#firstresponders](#)

[ExxonMobil Low Carbon Solutions](#) [ExxonMobil Pipeline Company](#)



# If we don't tell the CO<sub>2</sub> story, others will ...



Tapia STEM Camps | Tapia Center for Excellence and Equity in Education | Rice University

**Analysis of PHMSA Report on Denbury CO<sub>2</sub> Pipeline Rupture in Satartia, MS**  
Pipeline Fighters Hub  
Monday, Apr. 24, 6:30 p.m CT  
REGISTER [bit.ly/BPPSatartia](https://bit.ly/BPPSatartia)

**Bill Caram**  
Pipeline Safety Trust

**Paul Blackburn**  
Attorney, Bold Alliance

**Jane Kleeb**  
Bold Alliance &



**The Gassing of Satartia**  
By Dan Zegart

Pipeline Safety TRUST

**Better Path Presents**  
WEDNESDAY, SEPTEMBER 29 at 7 P.M.  
**The Gassing of Satartia**  
A CO<sub>2</sub> pipeline in Mississippi ruptured last year, sickening dozens of people. What does it forecast for the massive proposed buildout of pipelines across the U.S.?  
Dan Zegart, an investigative journalist and the senior investigator at the Climate Investigations Center, will discuss his chilling report.  
Register at [bit.ly/BPPSatartia](https://bit.ly/BPPSatartia)



ExxonMobil

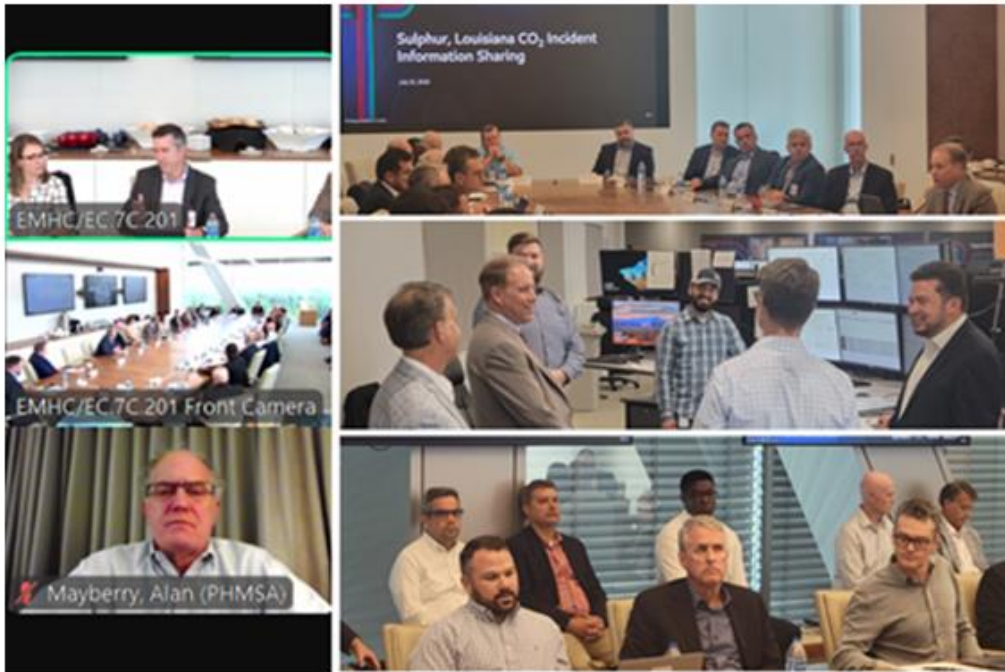
Pipeline

Imperial

Denbury

# Industry Safety Sharing & Lessons Learned

## ExxonMobil hosted API-LEPA meetings at EMHC



ExxonMobil hosted API-LEPA meetings with pipeline industry executives, U.S. Department of Energy (DOE) and U.S. DOT PHMSA: 07.23.24. ExxonMobil Pipeline Company hosted a series of in-person meetings and a safety information share involving pipeline operators, DOE and PHMSA and co-sponsored with API and LEPA. The day kicked off with a meeting between DOE, PHMSA and industry representatives that allowed DOE to outline loan and grant programs the Department is championing to promote responsible development of CO<sub>2</sub> pipeline infrastructure, a critical component of the energy transition. Assistant Secretary of Energy for the Office of Fossil Energy and Carbon Management Brad Crabtree, joined by staffers Robert Smith, Lindsey Anderson and Stuart Page, led the discussion with more than 30 executives representing 15+ pipeline operators, including ExxonMobil Pipeline Company and Denbury, Chevron, Oxy, Elysian/Buckeye, BP, Kinder Morgan, Plains, Williams, Summit Carbon Solutions, and Shell. In line with the meeting's topic, Nicolas Medina, EMPCo Public & Stakeholder Engagement manager, shared how P&SE programs, aligned to API RP 1185, such as our [first responder trainings](#) and [Tapia STEM CCS Camps](#), help raise awareness, understanding and early support for upcoming emerging fuel projects. EMPCo and Denbury then conducted a *Safety Information Share* on key findings and other takeaways from our investigation of the recent CO<sub>2</sub> release near Sulphur, LA. The session was led by Matt Young, EMPCo sr. pipeline integrity advisor, and Mark Armstrong, Denbury emergency response and preparedness manager. After EMPCo President Steve Yatauro stressed the importance of industry sharing in the face of an impending CO<sub>2</sub> pipeline buildout, [PHMSA Associate Administrator for the Office of Pipeline Safety, Alan Mayberry](#) (via Zoom) and DOE Assistant Secretary Crabtree echoed Steve's remarks and complimented EMPCo for being willing to share important lessons learned and increasing the industry's safety knowledge related to CO<sub>2</sub> pipeline operations. The session was very well attended, with more than 30 industry executives in-person and more than 100 other industry representatives from integrity, operations, community engagement and management positions. API and LEPA representatives were especially appreciative, because although there are many instances of industry sharing, this was only the third such post-incident lessons-learned industry sharing and first with CO<sub>2</sub> incidents. Following the safety information share, a group of



# Industry Safety Sharing & Lessons Learned

## Delta Pipeline Incident Near Satartia, MS

**The Incident, February 22, 2020**  
 A landslide ruptured the 24-inch-diameter Delta Pipeline that transports carbon dioxide (CO<sub>2</sub>) 77 miles from the Jackson, MS-area to Delhi, LA. In response, Denbury isolated the damaged segment by closing valves on either side of the breach; however, the CO<sub>2</sub> between the valves continued to vent.  
 Although industry-standard dispersion analysis did not predict a CO<sub>2</sub> release would affect the Village of Satartia, a perfect storm of factors, including temperature, humidity, light winds, topography and time of day, led the CO<sub>2</sub> to travel downhill and then along a gully to Satartia.



Emergency responders helped affected residents during the event. Although 45 people received medical care, none were admitted. Following the incident, third-party air monitoring experts and environmental scientists retained by Denbury confirmed safe conditions within the community and addressed their questions.

**Immediate Pipeline Operations Improvements**  
 After the Pipeline and Hazardous Materials Safety Administration approved the restart plan, Denbury shored up the affected hillside, installed strain gauges to monitor land movement, enhanced its geohazard program by adding telemetry to monitor pipeline movement, supplemented its dispersion analysis with computational fluid dynamics (CFD) modeling and installed a new 80-foot section of pipe to replace the affected section. Denbury safely restarted operations in October 2020.

**Advanced Pipeline Safety Enhancements**  
 To remove the risk to the pipeline of future land movement in the area, Denbury is now taking steps to replace that segment of the pipeline in 2024 and, in doing so, install the pipeline more than 80 feet below the surface by horizontal directional drilling.



**Community Engagement Extensions**  
 Following the incident, Denbury improved its community engagement along the entire pipeline route. Denbury met with emergency response officials and first responders in every county to reinforce familiarity with the Delta Pipeline's operations and to increase emergency responders' preparedness by conducting more frequent emergency drills. The company also provided grants to communities along the route to purchase monitors to detect CO<sub>2</sub> and telecommunications programs to alert residents about emergencies.

Immediately following the late-2023 ExxonMobil-Denbury merger, ExxonMobil Pipeline Company's (EMPCo) president and Denbury leadership traveled to Satartia to meet with local leaders to reinforce their commitment to continue enhancing safety and community engagement efforts. In addition to continuing to address Satartia's concerns, the two companies have integrated their operations and pipeline integrity expertise and are working to enhance industry knowledge and emergency responder preparedness.

**Increasing Industry Knowledge**  
 Denbury and EMPCo have taken a number of actions to advance industry's knowledge of the safe operation of CO<sub>2</sub> pipelines. Denbury presented the findings of a post-incident investigation to an industry conference to share lessons learned regarding geohazards, CO<sub>2</sub> dispersion and emergency response. In addition, both EMPCo and Denbury are contributing to industry R&D efforts into enhanced integrity standards, improved dispersion modeling and better leak detection.



**Developing New Emergency Response Guidelines**  
 Denbury and EMPCo experts helped lead the development of new industry guidelines for preparing for and responding to CO<sub>2</sub> pipeline emergencies. These guidelines are now the standard by which the pipeline industry prepares for and addresses CO<sub>2</sub> emergencies.

**Training Emergency Responders**  
 EMPCo developed training specifically designed to better prepare firefighters to manage liquids pipeline and storage tank emergencies. The curriculum is based on tactical guidance from the National Association of State Fire Marshals, the American Petroleum Institute and EMPCo. The classroom training and hands-on exercises are conducted in conjunction with the Texas A&M Engineering Extension Service (TEEX) at its world renowned Brayton Fire Training Field in College Station, Texas. EMPCo provides the training free-of-charge and funds nearly all of the firefighters' expenses incurred during the program.



As soon as the CO<sub>2</sub> Emergency Response Tactical Guidance was finalized, EMPCo added a curriculum module focused on addressing potential CO<sub>2</sub> releases and conducted the first-ever, hands-on training based on the new guidelines in 2023.  
 Since the inception of the program, EMPCo has trained nearly 1,000 firefighters.



## Response to CO<sub>2</sub> Incident near Sulphur, LA

**Background**  
 On April 3, 2024, Denbury's Green Pipeline system experienced a release of carbon dioxide (CO<sub>2</sub>) at its Lake Charles Pump Station in Sulphur, LA.  
 The Green Pipeline is a 320-mile, 24-inch-diameter pipeline that transports CO<sub>2</sub> from Donaldsonville, LA, to Houston. Its construction was completed in 2010. The pump station is located in a sparsely populated area.  
 There were no reports of injuries or significant impacts from the release.



ExxonMobil-sponsored CO<sub>2</sub> pipeline emergency response training at Texas A&M's world-renowned Brayton Fire Training Field.

**Emergency Response Training**  
 Prior to the incident, Denbury provided the responding fire departments and other Parish emergency response officials with information related to its assets, the characteristics of CO<sub>2</sub>, the behavior of a CO<sub>2</sub> release and a checklist of the initial steps of incident response.

- Promoted the ExxonMobil-sponsored hazardous liquid CO<sub>2</sub> pipeline and tank emergency response training, conducted with Texas A&M at its Brayton Fire Training Field.
- Provided information about the Pipeline and Hazardous Materials Administration's (PHMSA) Emergency Response Guidebook and the free National Association of State Fire Marshals' (NASFM) Pipeline Emergencies online training related to CO<sub>2</sub> pipeline emergency response, developed with input from Denbury and ExxonMobil. The on-site incident commander had enrolled in the "CO<sub>2</sub> Pipeline Safety and Emergency Response" training and completed the "Pipeline Emergencies: Awareness Level" course.

- Incident Response**  
 First responders conducted a textbook response, in-line with industry and NASFM emergency response practices. They:
- Identified the source of the release;
  - Determined the Denbury Control Center's phone number and called with the proper information;
  - Established a 330-foot perimeter (in-line with PHMSA's Emergency Response Guidebook) and closed the road;
  - Set up an on-scene command post;
  - Used the proper personal protection equipment (PPE);
  - Conducted air monitoring; and
  - Issued a quarter-mile-radius shelter-in-place order involving about 10 residences, out of an abundance of caution. The radius was based on weather, wind and other prevailing, on-scene conditions. It was lifted after about 1.5 hours, when first responders left the scene.



**Sharing Lessons Learned**  
 Following the incident investigation, ExxonMobil and Denbury shared the key findings and lessons learned with more than 100 pipeline industry representatives convened by the American Petroleum Institute and the Liquid Energy Pipeline Association. Information shared included guidance on both how to try to prevent similar incidents and how to effectively engage first responders so they are best prepared to manage CO<sub>2</sub> incidents. Representatives of the U.S. Departments of Energy and Transportation attended and commended the industry-wide safety information sharing.  
 The companies also invited Calcasieu Parish emergency response officials to present lessons learned during the ExxonMobil-sponsored pipeline and storage tank emergency response training conducted with NASFM and Texas A&M. The fire fighter-trainees appreciated hearing firsthand accounts from officials who had successfully responded to a recent CO<sub>2</sub> incident.

## Tactic 1

# Train & Engage with First Responders



<https://vimeo.com/user184185293>



<https://vimeo.com/user184185293>

## Tactic 1

# Train & Engage with First Responders

TEEX MS\_Hear From Jack Willingham

EMPCo

**Jack Willingham**  
Emergency Management Director  
Yazoo County, MS

I was honored to be able to speak  
with the class

Play 00:09

vimeo

<https://vimeo.com/918353016>

## Tactic 1

# Train & Engage with First Responders: 4Q24-2025

## 2024-2025 Trainings

ExxonMobil Pipeline Company is sponsoring four HazMat Liquid & CO<sub>2</sub> Pipeline and Industrial Fire Emergencies trainings in partnership with TEEEX in 2024 and four additional trainings in 2025. Trainings take place at Brayton Fire Training Field in College Station, TX. The training provides advanced, hands-on and companion classroom simulations focused on responding to multiple types of pipeline incidents including a CO<sub>2</sub> release.

Remaining 2024 trainings are scheduled for

- [November 9-10](#), Session registration closes October 25
- [December 7](#) (Open to Jefferson County, Texas, and immediately surrounding counties ONLY)



Registration coming soon for 2025! [Submit an interest form](#) for one of next year's classes. 2025 trainings are scheduled for

- February 21-22, 2025
- April 26-27, 2025
- September 20-21, 2025
- November 8-9, 2025

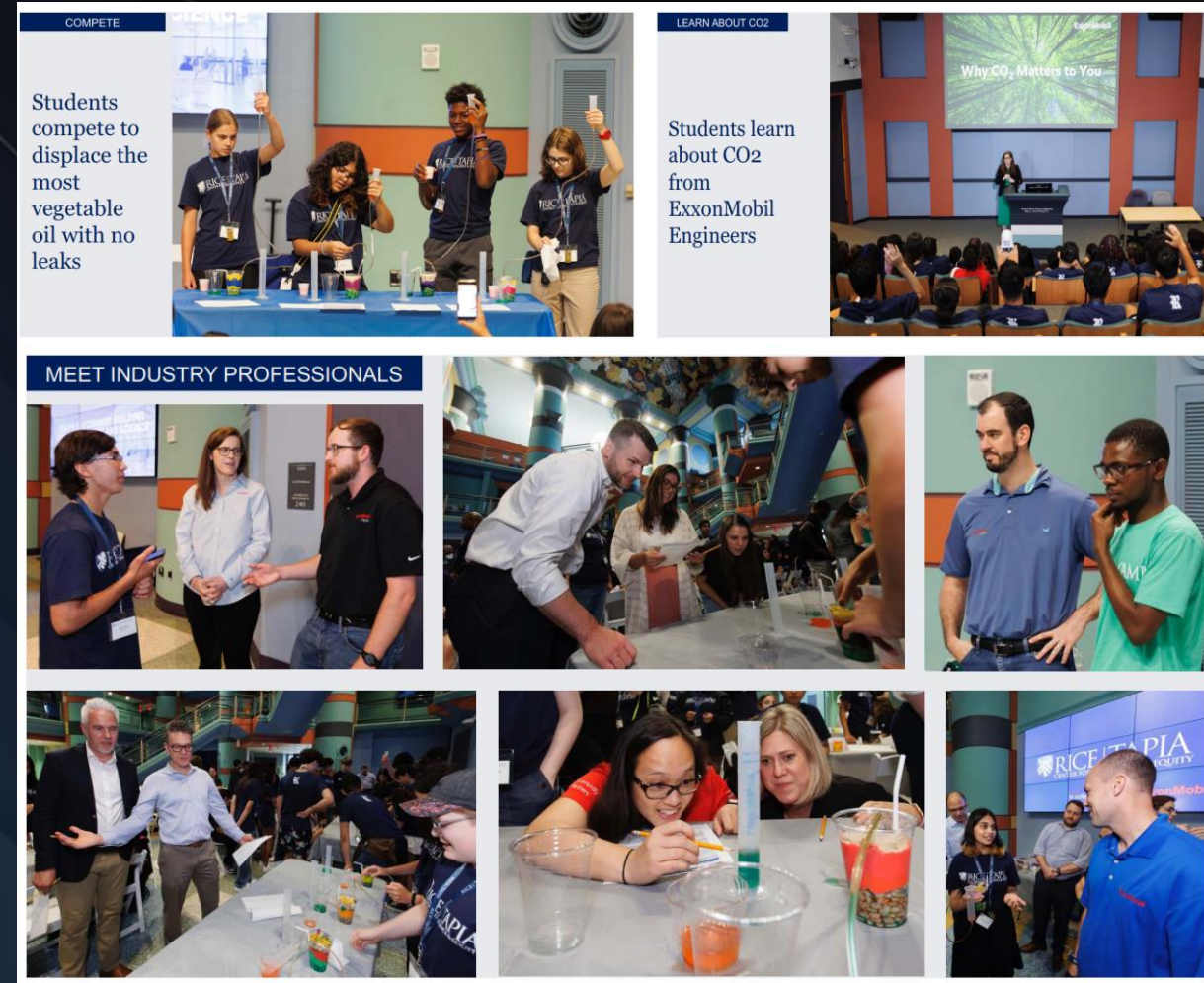
First time TEEEX training participants will need to select "create account" within the myTEEX student portal when registering.



**Adrián García**  
Harris County Commissioner

# Tactic 2: STEM CCS Camps

- Award-winning, residential STEM camps for rising 8th-12th graders from underserved communities
- 2023 camps
  - 500+ students, dozens of teachers, mostly from Texas and Louisiana
  - Focused on CO<sub>2</sub> and CCS
- 2024 camps
  - 1,000+ students and educators
  - Jackson State University (Jackson, MS)
  - Southern University (Baton Rouge, LA)
  - Rice University (Houston, TX)



## Tactic 2

# Tapia STEM CCS Camps

### Jackson State University hosting STEM Camp for highschool Students around the metro area

Dozens of excited high school students are getting the experience of a lifetime.



# Tactic 2

## STEM CCS Camps

STEM CAMPS for students

### About the Camps



**Communications**  
focused



**Equity** focused



# Tactic 2

## STEM CCS Camps

LEARN ABOUT CO<sub>2</sub>

Students learn about CO<sub>2</sub> from ExxonMobil Engineers





## Tactic 2

# STEM CCS Camps

### BUILD YOUR RESERVOIR

Students build a model underground reservoir filled with water



## Tactic 2

# STEM CCS Camps

### STORE CARBON

Students inject vegetable oil, representing supercritical CO<sub>2</sub>, into their reservoir



# Tactic 2

## STEM CCS Camps

### COMPETE

Students compete to displace the most vegetable oil with no leaks



# Tactic 2

## STEM CCS Camps

JUDGED BY EXPERTS

ExxonMobil employees officially determine the winning groups



# Tactic 2

## STEM CCS Camps

### PRESENTATIONS

Students present what they learned about Carbon Capture and Storage



# Tactic 2 STEM CCS Camps

MEET INDUSTRY PROFESSIONALS



# Tactic 2 STEM CCS Camps

STEM CAMPS for students

## Media Coverage



On average, more than 5M impressions from media attention each summer

# *Tactic 2* STEM CCS Camps



<https://vimeo.com/user184185293>



# Tactic 2

## STEM CCS Camps

### 2025 Summer Sessions



Tapia Camps are a 6-day/5-night program at Rice University in Houston, Texas. Food and lodging is provided, and campers live in the dormitories and spend their instruction time in the buildings on campus. A field trip will take place within Houston (e.g., at Space Center Houston/NASA Johnson Space Center).

#### 2025 Tapia Camps Schedule

We are excited to announce that registration is now open for our upcoming Summer 2025 programs!

- Session 1: July 6 - 11 | [Register](#)
- Session 2: July 13 - 18 | [Register](#)
- Session 3: July 20 - 25 | [Register](#)
- Session 4: July 27 - August 1 | [Register](#)

[Tapia STEM Camps](#) | [Tapia Center for Excellence and Equity in Education](#) | [Rice University](#)

<https://tapiacenter.rice.edu/tapia-stem-camps>

# Tactic 3: Engage with 3Ps/Diverse Groups



# Tactic 3

## Engage with 3Ps/Diverse Groups



## Tactic 3

# Engage with 3Ps/Diverse Groups

### **Harris County Commissioner Adrian Garcia (Precinct 2) Meets with API Midstream Committee**



**API Midstream Committee 2Q24 Meeting:** 5.15.24: **Adrian Garcia Meets with API MC on RP 1185 – Houston, TX:** ExxonMobil Pipeline Company coordinated a visit by Harris County Commissioner Adrian Garcia (Precinct 2) with the American Petroleum Institute (API) Midstream Committee for its 2Q24 meeting in Houston. Nick Medina, EMPCo’s Public & Stakeholder Engagement Manager joined representatives of 20+ Midstream operators in a conversation with Commissioner Garcia on [API Recommended Practice 1185](#) on Pipeline Public Engagement. Commissioner Garcia shared how Harris County Precinct 2 is assisting industry with an efficient and expedited permitting process for new investments in emerging fuels including CO<sub>2</sub> pipelines and hydrogen projects. He commended industry on its shared commitment to safety and to furthering effective [public engagement via RP 1185](#). He also expressed support for industry programs to train first responders ahead of new investments, such as the [ExxonMobil-sponsored HazMat Liquid & CO<sub>2</sub> Pipeline and Industrial Fire Emergencies training](#) at Texas A&M TEEX. Commissioner Garcia shared his experience from his [visit to TEEX](#) last month where he addressed a class of 80+ volunteer and municipal firefighters from across Gulf Coast region. He also encouraged industry efforts for more R&D to address safety concerns via odorizing or adding color to new fuels or harmful gases to facilitate detection and avoid people being hurt during incidents. He concluded by emphasizing the critical role of workforce development in the energy transition: “in East Harris County alone, we have more than 25,000 people employed in the energy sector that represent the engine of the Texas economy. These are the same folks who we will be counting on for the emerging fuel economy. We must Engage, Educate and Empower them to be part of the energy future.” A copy of Commissioner Garcia remarks is found [here](#).

### **EMPCo and API Midstream Meet with Houston Faith, Academia and Community Leaders**



**API Midstream Committee 2Q24 Meeting:** 5.15.24: **Advancing Effective Public Engagement with RP 1185 – Houston, TX:** Earlier this week, ExxonMobil Pipeline Company and API arranged a dinner at [Davis Street](#), a minority owned restaurant in Houston’s 3rd Ward, to bring together community leaders and midstream operators with presence in the region. The evening followed the API Midstream Committee meeting held in Houston on May 15 when [Harris County Precinct 2 Commissioner Adrian Garcia](#) engaged with operators on upcoming energy transition. The event is aligned with industry efforts to advance [API RP 1185](#) on pipeline public engagement. [Bishop James Dixon II](#), pastor of Community of Faith church and President of the Houston NAACP, as well as [Yolanda Smith](#), Executive Director of the Houston NAACP and [Tulane Adjunct Law Professor Larry Kahn](#), were special guests at the dinner. Bishop Dixon previously engaged [Harris County Precinct 1 Commissioner Rodney Ellis](#) and Nick Medina, EMPCo P&SE manager, ahead of [construction for the Wink to Webster Pipeline](#). Ongoing and meaningful engagement with community and faith leaders near pipeline routes is essential to build support for upcoming lower carbon investments in critical infrastructure and the safety of our operations.

## *Tactic 3*

# Engage with 3Ps/Diverse Groups



# We All Need To Do Our Part



**Educate**



**Advocate**



**Get Involved**


# For More Information...

**ExxonMobil** | Pipeline About Our work Emerging fuels pipelines Safety and environment Community Tariffs Resources Q

## Delivering the Benefits of Energy and Innovating for the Future

Pipelines help connect you to the energy, raw materials and products that build your lifestyle. At ExxonMobil Pipeline Company, we build the vital infrastructure that allows these connections to flourish and our communities to thrive.

[Learn more](#)



◀ ● ● ● ● ● ▶


## Safety

Our number one tenant is safety — for our workers, our communities and our planet. Our overlapping safety measures help us ensure our pipelines continue to deliver needed products and materials without incident. And we work closely with external teams and first responders to ensure everyone is as prepared as possible to act in the unlikely event of an emergency.

[Read about our commitment to safety](#)

## Sustainability

ExxonMobil Pipeline Company is enhancing the sustainability of its operations that keep today's energy products flowing while preparing to safely transport products that will enable America's lower-carbon future.



<https://www.exxonmobilpipeline.com/en>

# For More Information...



**ExxonMobil** | Pipeline – Texas

Our Work ▾ Emerging Fuels Pipelines ▾ Safety ▾ Community ▾ Resources ▾ Updates Contact

## Helping Deliver Texas' Lower-Carbon Energy Future

As we work to achieve our climate goal commitments, few challenges are more important than maintaining an accessible and affordable supply of energy while reducing its environmental impact. ExxonMobil is playing a leading role in addressing this challenge by lessening the carbon footprint of its own operations while spearheading technologies that will produce lower-carbon fuels and help carbon-intensive industries reach their net-zero emission targets. Working to make these goals a reality, ExxonMobil Pipeline Company is leveraging its logistical and pipeline expertise to keep today's energy products flowing by preparing to safely transport products that will

[bilpipeline.com/project-updates](https://txgulfcoast.exxonmobilpipeline.com/) lower-carbon future.

### Videos

#### TEEX

- HazMat Liquid & CO<sub>2</sub> Pipeline and Industrial Fires Emergency Response Training
- Louisiana Firefighters on TEEX Training
- Mississippi Firefighters on TEEX Training
- Hear from Philip Oakes, National Association of State Fire Marshals, on Updated TEEX Training
- Hear from Jody Herrera, Chief of Jefferson County ESD #3 (Texas), on TEEX Training
- Hear from Alan Gartner, Chief of Woodville Fire & Rescue (Texas), on TEEX Training
- Hear from Todd Parker, Chief of Ward 6 VFD (Louisiana), on TEEX Training
- Hear from Harris County Commissioner Adrian Garcia on TEEX Training
- Hear from James LeBlanc, Safety Director for Ascension Parish, on CO<sub>2</sub> Pipelines
- Hear from Nat Stephens, Chief of the Geismar (Louisiana) Fire Department, on TEEX Training
- Hear from Jack Willingham, Emergency Management Director for Yazoo County (Mississippi)
- Hear from Woody Pettis, Chief of the Tri-Community VFD (Mississippi), on TEEX Training
- Hear from Richard Pickens, Chief of the District 3 VFD (Mississippi), on TEEX Training
- Hear from Thomas Stone, Office of the Louisiana State Fire Marshal, on TEEX Training
- Hear from Philip Oakes, National Association of State Fire Marshals, on TEEX Training
- Hear From a Firefighter: AJ Freil
- Hear From a Firefighter: Blake Clark
- TEEX - Hear from a Firefighter: Hayden McDougal
- TEEX - Hear from a Firefighter: Jose Aguilar
- TEEX - Hear from a Firefighter: Shaun Swett
- TEEX - Hear From a Firefighter: Erin Bocanegra
- TEEX - Hear From a Firefighter: Larry Wallace
- Working with our First Responders

#### STEM

- 2024 STEM CCS Camps
- Tapia-Jackson State STEM CCS Camp 2024
- Tapia-Jackson State STEM CCS Camp 2024 (Short)
- Tapia-Jackson State STEM CCS Camp 2024 (Students and Educators)
- Tapia-Jackson State STEM CCS Camp 2024 (Elected Officials and Administrators)
- Tapia-Jackson State STEM CCS Camp 2024 (Denbury Employees)
- Tapia-Southern University STEM CCS Camp 2024
- Tapia-Southern University STEM CCS Camp 2024 (Short)
- Tapia-Southern University STEM CCS Camp 2024 (Students and Educators)
- Tapia-Southern University STEM CCS Camp 2024 (Administrators)
- Tapia-Rice STEM CCS Camp 2024
- Tapia-Rice STEM CCS Camp 2024 (Short)
- Tapia-Rice STEM CCS Camp 2024 (ExxonMobil Employees)
- Tapia-Ascension Parish STEM CCS 2024
- Houston-Louisiana STEM Camps 2023
- STEM CCS Camp at Rice University 2023
- STEM CCS Camp at Southern University 2023
- Hear from Dr. Paul Hand on the Tapia STEM Camps

<https://txgulfcoast.exxonmobilpipeline.com/>





**Thank You !**

**ExxonMobil** | Pipeline

  
**Imperial**

**Denbury** 