

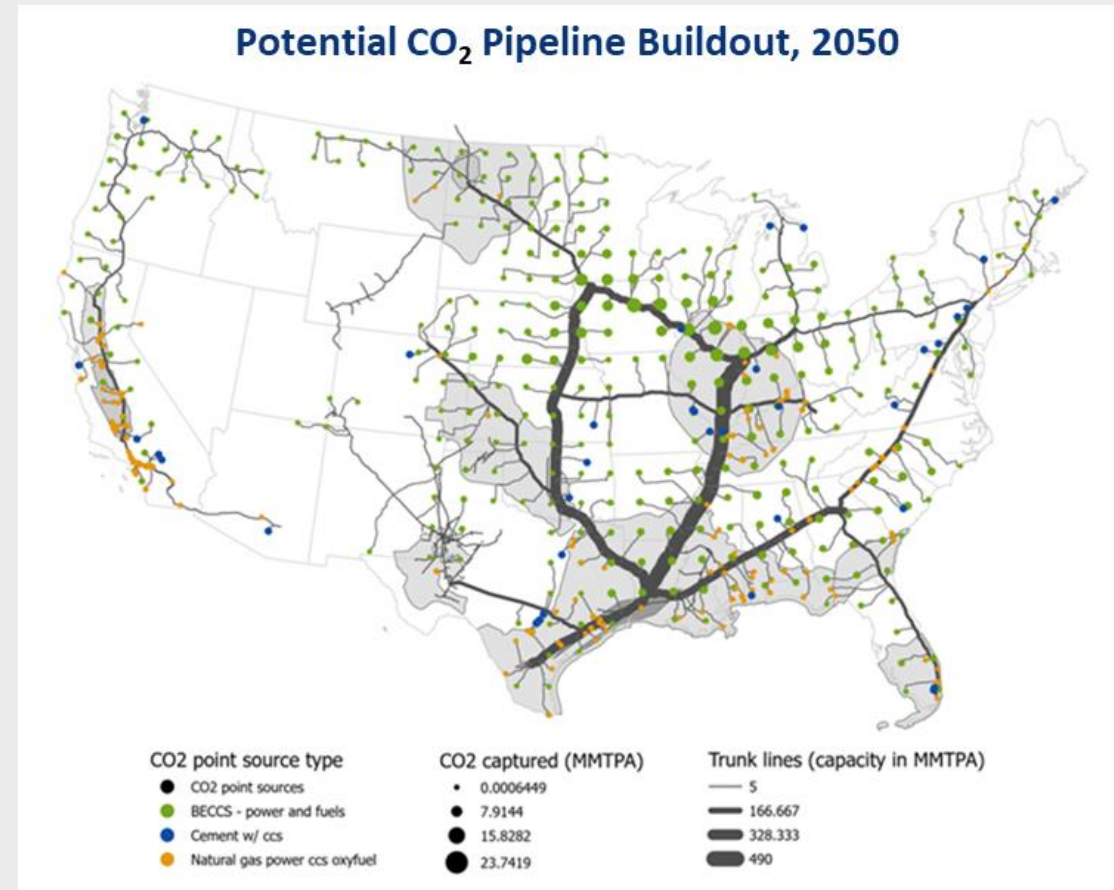
API-OMB Meeting CO₂ Pipeline Safety NPRM RIN2137-AF60

Executive Order 12866 Meeting

MARCH 7, 2024

Meeting Topics to Address

- CO₂ Pipeline Safety Record
- Review of existing regulations and standards driving CO₂ pipeline safety
- Recommendations for PHMSA Notice of Proposed Rulemaking
- Significance of the Rule



Source: Center for Energy and the Environment, Princeton University, "Princeton's Net-Zero America Study, Annex I: CO₂ Transport and Storage Infrastructure Transition Analysis," 2020.

Safety of CO₂ Pipelines

- More than 5,200 miles of CO₂ pipelines exist in the US transporting ~80 million metric tons of CO₂ per year from natural and industrial sources.
- Industry has operated CO₂ pipelines safely for more than four decades. There have been no fatalities or injuries associated with a CO₂ pipeline incident.
- PHMSA incident data from the last 10 years shows CO₂ pipelines have the lowest rate of incidents per mile for all liquids pipelines.

Pathway to Improvements in CO₂ Pipeline Safety



PRCI
GTI
OTD
NYSEARCH
PHMSA
DOE
Academia

API
ASME
AMPP
CSA
ISO
NFPA

49 CFR §195

Existing Regulations and Industry Standards

- **49 CFR§195**
 - Comprehensive regulatory framework that addresses supercritical CO₂ pipeline safety
 - Design and construction – fracture control, leak detection, welding, etc.
 - Operations and maintenance – HCA analysis, leak detection and valve placement requirements, integrity management and repair criteria, emergency response, conversion of service
 - Corrosion prevention and mitigation
- **Current CO₂ Pipeline Safety Industry Guidance/Standards**
 - A number of existing standards are being applied by CO₂ pipeline operators
 - DNV RP-F104
 - ISO 27913
 - IOGP reports and guidance
 - AMPP Guide 21532 (2023)
 - ASME B31.4
 - API standards for materials and measurements
 - API and LEPA have published a CO₂ emergency response tactical guide.
 - NASFM Portal established for CO₂ pipeline training.
 - [CO₂ ER training](#) is available at TEEX.

Ongoing Work to Improve Safety

- **Research & Development**

- Extensive ongoing work through USDOT, USDOE, PRCI and Emerging Fuels Institute should inform the rulemaking.

- **Standards**

- API is developing a new CO₂ pipeline transportation standard, as well as updating existing standards for metallic and non-metallic materials and measurement.
- API is also working on a recommended practice specific to geohazards that could enhance safety for all pipelines, including CO₂.
- ASME B31.8 is currently being revised to address CO₂ in addition to other gaseous fuels.

API Recommendations for PHMSA NPRM

- A CO₂ pipeline safety rule must be technically feasible, risk based, and flexible/scalable.
- Focus on improvements to the existing robust regulatory program:
 - Include gas phase CO₂ regulations under 49 CFR§195, which governs transportation of supercritical phase CO₂;
 - Enhance requirements for fracture arrest/control;
 - Specifically reference CO₂ dispersion modeling in 49 CFR§195.450 and Appendix C.
- Avoid prescribing the use of odorants pending evaluation of the safety and integrity implications for pipelines.
- Any Emergency Response requirements should ensure the protection of sensitive information and be aligned with current industry best practices.
- Where possible, the NPRM should incorporate industry standards and best practices.

Why is a CO₂ Rule Important?

- We know that carbon capture and sequestration are necessary to reduce emissions and meet the Administration's climate goals.
- Our industry is investing heavily in carbon capture and sequestration and can play a role in meeting those goals because pipelines are essential to transporting CO₂.
- The rule must be technically feasible and set realistic timelines for implementation to ensure it supports rather than hinders the buildout of this additional CO₂ pipeline infrastructure.

The “Energy” Behind Carbon Capture and Storage

POET and Summit Carbon Solutions Announce Carbon Capture Partnership



In a major step forward for the future of agriculture and biofuels, POET and Summit announced a groundbreaking partnership connecting the world's largest biofuel producer with the world's largest carbon capture and storage project. This addition will incorporate 17 POET plants into the pipeline route and capture 4.7 million metric tons of CO₂.

OVERVIEW

Proven technologies like carbon capture and storage are critical to help meet society's lower-emission goals.

The United Nations Intergovernmental Panel on Climate Change and the International Energy Agency agree that carbon capture and storage is one of the most cost-effective ways to decarbonize **emission-intensive sectors**, including chemicals and refining, cement production, and the iron and steel industries. Additionally, carbon capture and storage is recognized as one of the few technologies that can enable negative carbon dioxide emissions when combined with bio-energy or direct air capture. According to the Center for Climate and Energy Solutions, carbon capture and storage can capture more than 90% of emissions from power plants and industrial facilities.¹

At ExxonMobil Low Carbon Solutions, we are, and will continue to play, an important role in bringing carbon capture and storage technology to scale, because of our depth and breadth of experience. We understand the subsurface. We know how to build large projects, and we know how to operate them safely and efficiently.

Energy Transition

Talos, Freeport LNG to develop Gulf Coast CCS project

Talos Energy Inc. and Freeport LNG Development LP intend to develop a carbon capture and sequestration project, the Freeport LNG CCS project, immediately adjacent to Freeport ...

[OGJ editors](#)

Nov. 16, 2021

Energy Transition

PETRONAS, Technip Energies establish framework for carbon capture collaboration

PETRONAS and Technip Energies signed a heads of agreement (HoA) establishing a collaboration framework for the further development and commercialization of carbon capture technologies...

[OGJ editors](#)

Nov. 15, 2021

Department of Energy

Biden-Harris Administration Invests \$251 Million to Expand Infrastructure to Support CO₂ Transport and Storage

MAY 17, 2023

Pathway to Reaching Climate Goals

Increasingly recognized: there is no pathway to reach global climate targets without carbon capture technology.

Why Carbon Capture?

- Could play a key role in achieving net-zero GHG emissions in manufacturing and industry (hard-to-abate sectors)
- Provide low-carbon dispatchable power
- Enable low-carbon hydrogen production at scale
- US geology provides for abundant sequestration opportunities
- Meet increasing demand for low-emissions products, carbon-derived products, and carbon offsets

The *Inflation Reduction Act* increased the tax credit value for both capture and storage as well as utilization to levels that unlock economically viable opportunities to develop CCS/CCUS at scale

Additional Recommendations to Enhance CO₂ Pipeline Safety

- Strengthen public awareness through incorporation of the most up to date version of industry Recommended Practice 1162 (3rd Ed.)
- Continue support for PHMSA R&D Program and keep the focus on CO₂ pipeline safety.