



NARUC

National Association of Regulatory Utility Commissioners

Onshore U.S. Carbon Pipeline Deployment: Siting, Safety, and Regulation

June 29, 2023 2:00 – 3:00 PM ET

Moderator: Hon. Mary Throne, Wyoming

Panelists:

Colin Seals, Director, Public Sector Consultants

Carmen Siciliano, Senior Consultant, Public Sector Consultants

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Public Sector Consultants

Colin Seals

Carmen Siciliano

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Scope of Work

- Investigate land-based CO2 pipeline regulations
 - Carbon capture, utilization, and storage (CCUS) role in 2050 climate goals
 - Current CO2 transmission pipeline practices
 - Federal, state, and local responsibilities for siting, safety, and economic regulation
 - Considerations for state and federal regulators



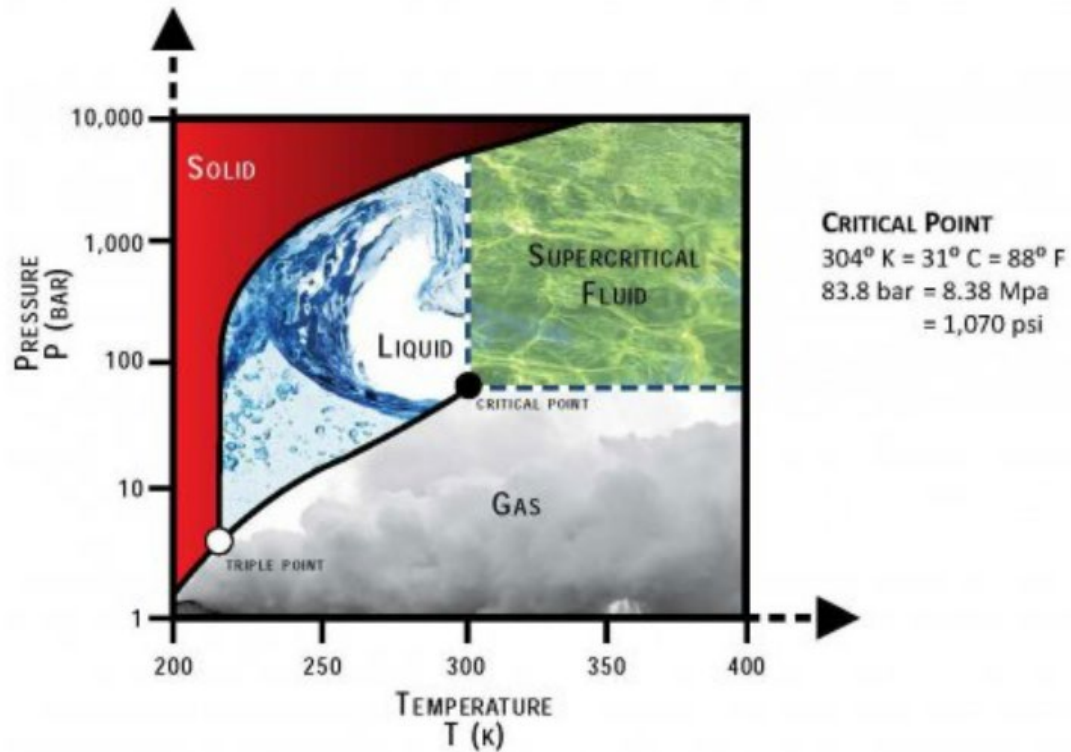
CCUS Background

- Defining CCUS
- Global market (\$2.1 billion) growth
 - Expected 19.5 percent increase annually through 2028
- U.S. development incentive growth
 - Department of Energy (DOE) has supported CCUS projects since the mid-1990s
 - 45Q tax credits
 - Bipartisan Infrastructure Law and Inflation Reduction Act—supersized investments

Barriers to CCUS Deployment

- Technical feasibility
- Cost
- Inconsistent incentives
- Scarcity of opportunities for utilization
- Scarcity of infrastructure
- Public opposition

CO2 Pipeline Primer



- Transmission pipeline technology and infrastructure
 - Pipelines: Large quantities of CO2 over long distances
 - Physical state of CO2 in pipelines (liquid, gas, supercritical)
 - Carbon steel construction with internal and external corrosion protection
 - Conversion of hydrocarbon pipelines

Pipeline Primer

- Safety considerations
 - Incidents of failure
 - Health and environmental impacts of leaks
 - Stream purity and pipeline integrity (phase behavior and corrosion)
 - Interconnection

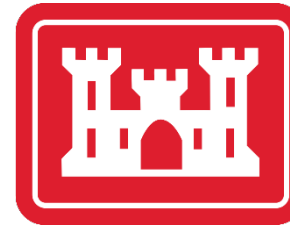


CO2 Pipeline Primer

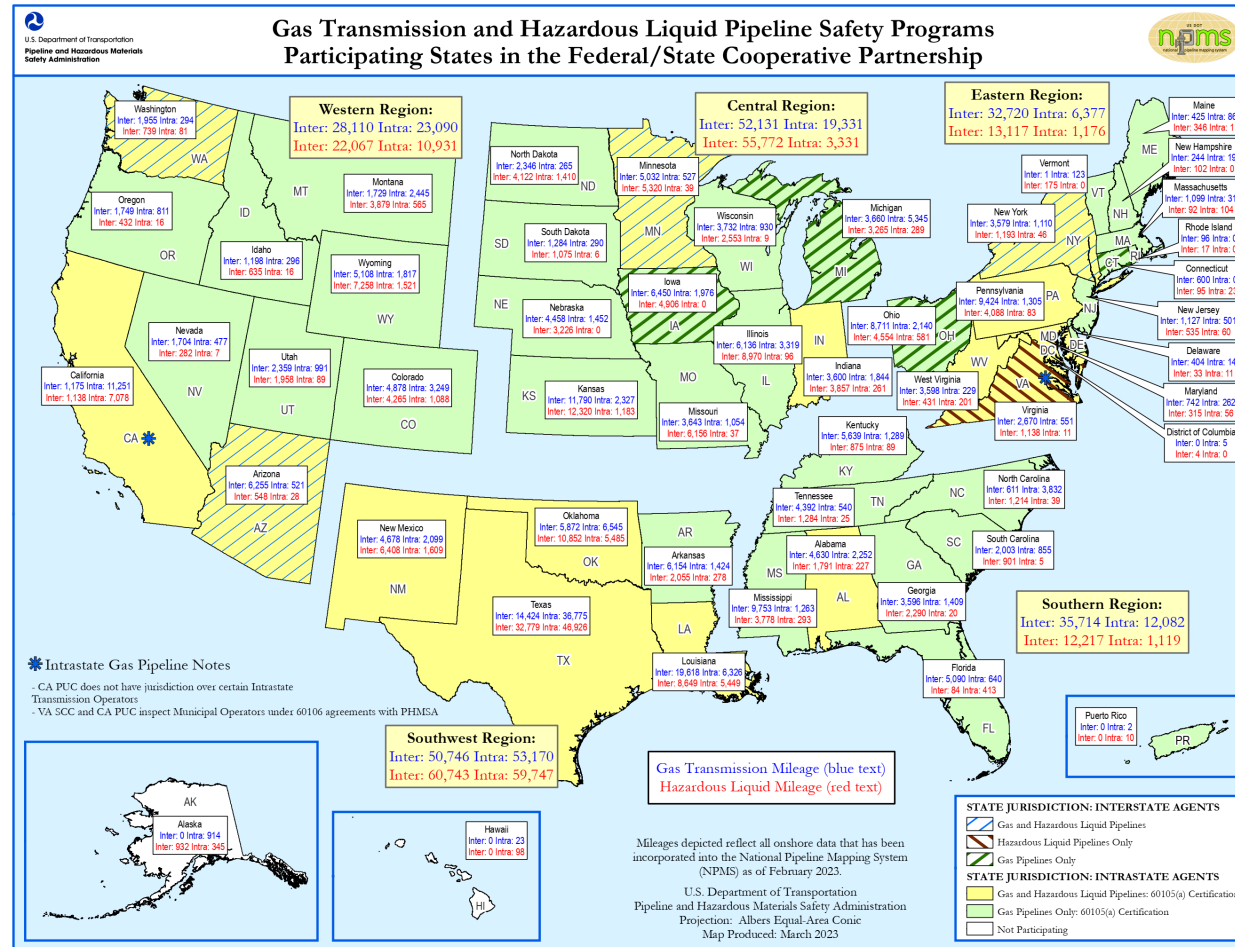
- Estimates for the deployment of new land-based CO2 pipelines capacity
 - Princeton Net-Zero America (66,000 pipeline miles)
 - Great Plains Institute (29,000 pipeline miles)
 - Decarb America

CO2 Pipeline Regulation

- Complex web of federal, state, and local regulations
 - Siting: State or local approval for siting (excluding federal lands)
 - Depends on route and jurisdiction, extensive to minimal permitting
 - Federal Energy Regulatory Commission and Surface Transportation Board
 - Right-of-way access
 - Safety: Primarily federal
 - Economic regulation: Minimal



CO2 Pipeline Regulation: Federal



- U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA)
 - Jurisdiction: Interstate and some intrastate pipelines
 - State cooperative partnerships

CO2 Pipeline Regulation: Federal

- Regulatory treatment by CO2 physical state
 - Narrow definition of supercritical CO2
 - The Pipeline Safety, Regulatory Certainty, and Jobs Creation Act of 2011 sought the exploration of CO2 transportation as a gas

CO2 Pipeline Regulation: Federal

- Impact areas for CO2 pipeline rupture
 - Modeling used for other hazardous liquids inadequate for CO2
 - Unique dangers of CO2—colorless, odorless, dispersion significantly impacted by geography

CO2 Pipeline Regulation: Federal

- Recent PHMSA action
 - 2019: Inspection and leak detection rule updates
 - 2022
 - Issued \$4 million fine for Satartia incident
 - Advisory bulletin on extreme weather and pipeline inspection
 - Research grant for dispersion modeling
 - New rules, specific to CO2 pipelines, coming soon?

CO2 Pipeline Regulation: State and Local

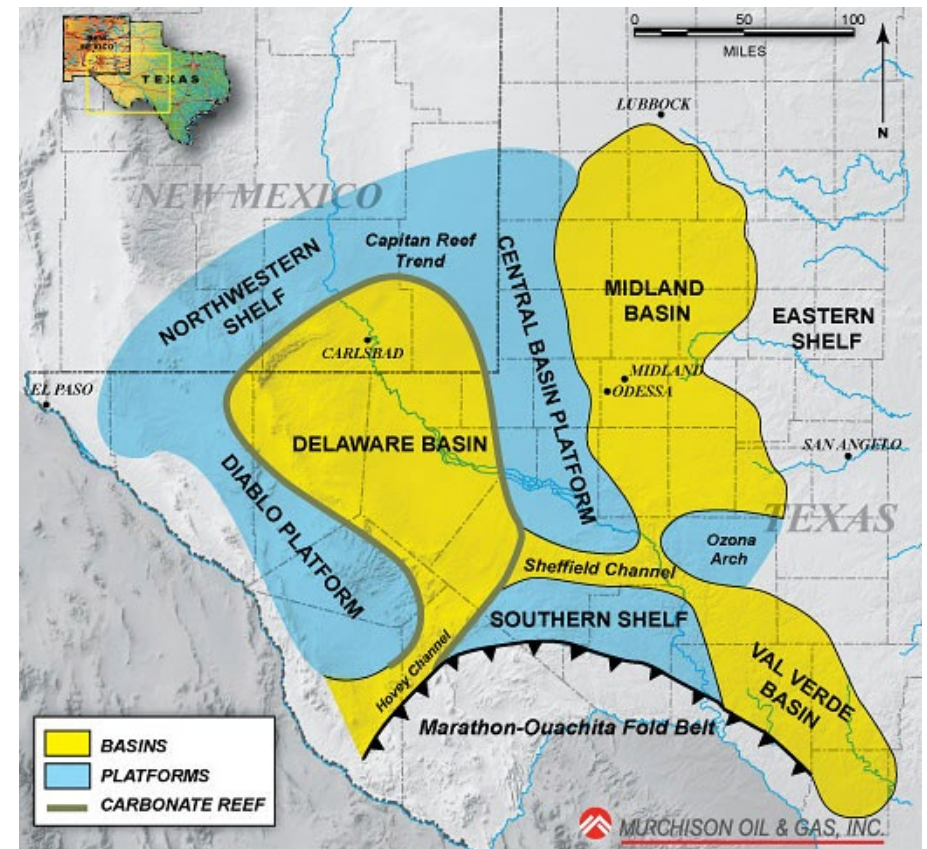
- Narrow federal regulations leave significant opening for state and local regulators
- CCUS incentives driving investments that outpace federal regulation

CO2 Pipeline Regulation: State and Local

- Texas

- First CO2 pipelines in the U.S.
- Regulated by the Railroad Commission of Texas—no permits
- Common carrier self-designation

Permian Basin

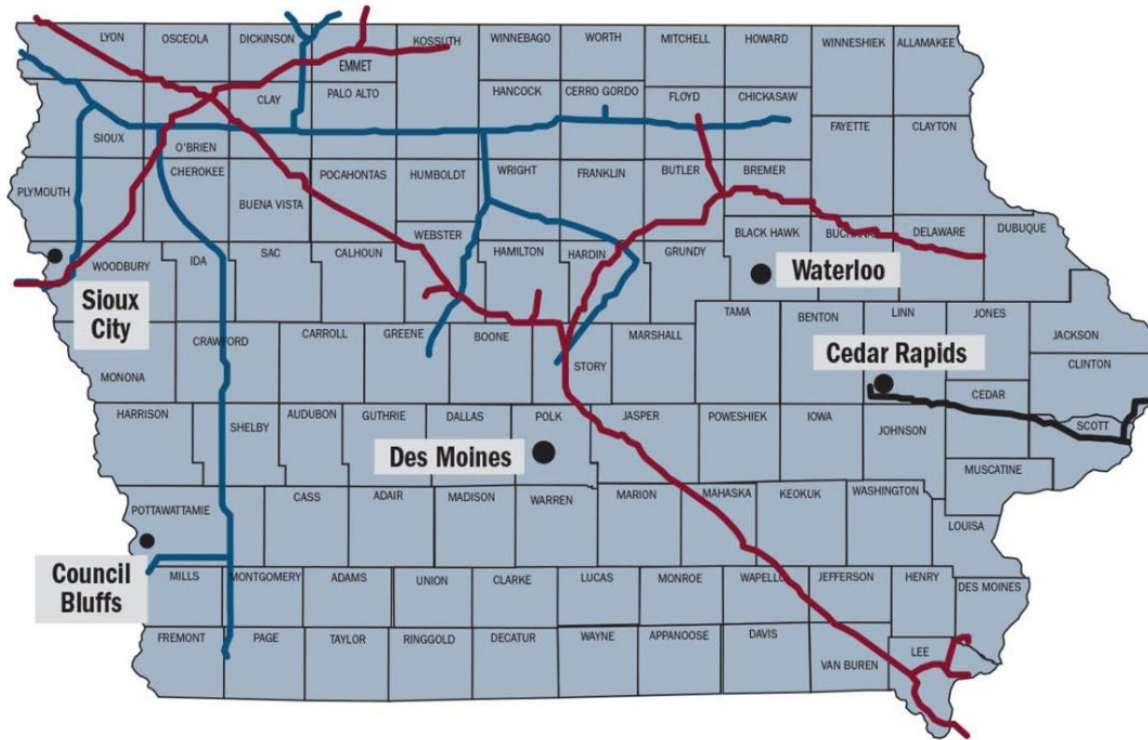


CO2 Pipeline Regulation: State and Local

- Illinois
 - Regulated by the Illinois Commerce Commission
 - CO2 transport by pipeline declared a public use and benefit
 - Broad eminent domain authority
 - No common carrier requirement
 - Only Midwest state with a dedicated CO2 pipeline statute
 - Multiple recent proposals, including a California-style moratorium

CO2 Pipeline Regulation: State and Local

Summit Carbon pipeline Navigator Heartland pipeline Wolf Carbon pipeline



Sources: Summit Carbon Solutions, Navigator Heartland Greenway and Wolf Carbon Solutions

Gazette map

• Iowa

- Regulated by the Iowa Utilities Board
 - Broad eminent domain authority with a certificate of public convenience and necessity
 - Common carrier status not required
- Epicenter of the current CO2 pipeline debate
 - Summit, Navigator, and Wolf pipeline projects

CO2 Pipeline Regulation: State and Local

- Nebraska/Minnesota
- Contrasting approaches to regulation in the absence of CO2-specific authority
 - Nebraska Public Service Commission
 - No state-level siting authority
 - Unclear eminent domain authority for pipeline developer—no legal challenges, yet
 - Local authorities heavily lobbied by pipeline opponents
 - Minnesota Public Utilities Commission
 - The commission voted unanimously in 2022 that it had authority under existing law to regulate CO2 pipelines
 - The commission received support and opposition from pipeline developers
 - 2023 legislation added CO2 to statutory pipeline definitions

CO2 Pipeline Regulation: State and Local

- California
 - California enacted a moratorium on utilization of CO2 pipelines until PHMSA provides updated safety rules
 - California Natural Resources Agency and Public Utilities Commission charged with developing draft regulatory framework for CO2 infrastructure in early 2023
 - Long-term deployment outlook unclear pending PHMSA action

CO2 Pipeline Regulation Gaps

- Matters of unclear jurisdiction
 - Economic regulation
 - Physical state
 - Environmental justice
 - Multijurisdictional pipelines

Biden signs order prioritizing 'environmental justice'

Midwest CO2 pipeline rush creates regulatory chaos

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

States rush to make rules governing CO2 pipelines planned for Midwest

CO2 pipelines planned for Minnesota, Illinois, Iowa, Nebraska, the Dakotas

SAFETY ADVOCATE WARNS OF A LACK OF OVERSIGHT FOR NEW CO2 PIPELINES NEEDED FOR CARBON CAPTURE

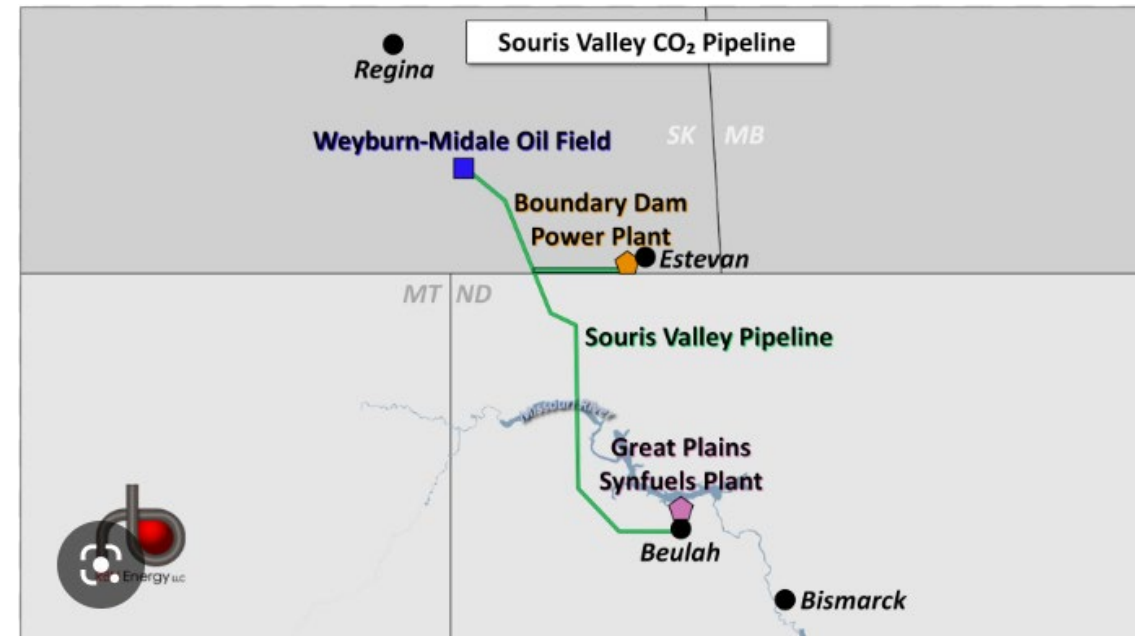
US carbon pipeline faces setback as residents refuse to cede land rights

CO2 Pipeline Regulation: International

- U.S. is home to a majority of world's CO2 pipeline infrastructure
- Growing interest worldwide
 - Alberta Carbon Trunk Line
 - Delta Rhine Corridor

CO2 Pipeline Regulation: International

- Canadian approach
 - Canada Energy Regulator (CER) exercises exclusive authority for siting, operation, and economic regulation for CO2 pipelines crossing provincial or international borders (e.g., Souris Valley)
 - CER can exercise eminent domain authority for private or common carrier pipelines



Hydrogen Pipeline Regulation

- Hydrogen has received similar market incentives via BIL and IRA, improving project economics and speeding deployment
 - Advantage of being viewed as an energy commodity serving as a fuel and energy storage medium
 - Different safety concerns and potential for greater siting opposition due to the risk of combustion
- Lack of clear regulatory authority
- Transported as a gas, more likely to fall under existing federal authority

Questions for Policy and Regulatory Decisionmakers

- PHMSA
 - CO2 defined
 - Impact radius and emergency response protocols
 - Stream purity



Questions for Policy and Regulatory Decisionmakers

- DOE
 - Alignment of research and grant funding to support collaboration in multijurisdictional deployment
 - Application of common carrier requirements for Carbon Dioxide Transportation Infrastructure Finance and Innovation Program in the absence of consistent national standards



Questions for Policy and Regulatory Decisionmakers

- Public utility commissions (PUCs) and other state-level policymakers
 - Clear permitting standards and regulatory authority for PUCs
 - Building technical expertise
 - Supporting interstate development
 - Common carrier consistency
 - Alternative dispute resolution options for siting



Conclusion

- Regulatory uncertainty could limit CCUS infrastructure deployment and affect carbon reduction goals
- Federal agencies can lead by driving timely research to address public safety concerns
- Significant opening for national organizations (e.g., National Association of Regulatory Utility Commissioners) to facilitate inclusive CO2 policy development

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Upcoming

- NARUC Summer Policy Summit, July 16-19 in Austin, TX
 - Clean Coal Subcommittee panel:
Balancing New EPA Power Plant Emission Rules with Reliability Considerations: Clean Air Act Section 111 After EPA v. West Virginia
Sunday, July 16th 2:45-3:45pm
- Check www.naruc.org/cpi for information on upcoming activities



Thank you!

Visit www.naruc.org/cpi for additional resources

Contact Kiera Zitelman (kzitelman@naruc.org) and Kathryn Kline (kkline@naruc.org) with questions

