



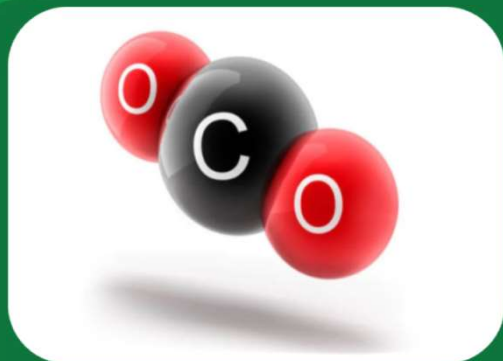
U.S. DEPARTMENT OF
ENERGY

Fossil Energy and
Carbon Management

DOE Carbon Transport Program Strategic Vision & Future Outlook

Robert Smith & Kevin Dooley
Carbon Transport Program
Office of Fossil Energy and Carbon Management

August 31st, 2023



Bipartisan Infrastructure Law (BIL) Overview

CO₂ Transport: An integral component to several BIL Provisions listed in Green.

- **\$12 billion** in new carbon management RD&D: **\$7 billion** Managed directly by FECM
- **\$9.5 billion** for hydrogen hubs and RD&D
- Generally, cost share is 80% government/20% applicant for early TRL R&D and 50%/50% for demonstration projects

Point Source Capture and Direct Air Capture

- **Regional Direct Air Capture Hubs: \$3.5 billion**
- DAC Technology Prize Competition: \$115 million
- **CCUS Integrated Demos: \$2.5 billion (OCED)**
- Carbon Capture Large Pilot: \$1 billion (OCED)

Hydrogen

- **Hydrogen Hubs: \$8 billion (OCED)**
- Hydrogen Recycling Program: \$500M
- Hydrogen Electrolysis: \$1 billion

Carbon Transport Systems

- Pre-FEED studies for CO₂ Transport Intermodal Hubs – Connectivity to Barge, Ship, Rail, Truck, and Intermediary Facilities: \$2.5 million
- **FEED Studies for Transport Systems: \$100 million**
- **CIFIA: Loans and Future Growth Grants: \$2.1 billion**

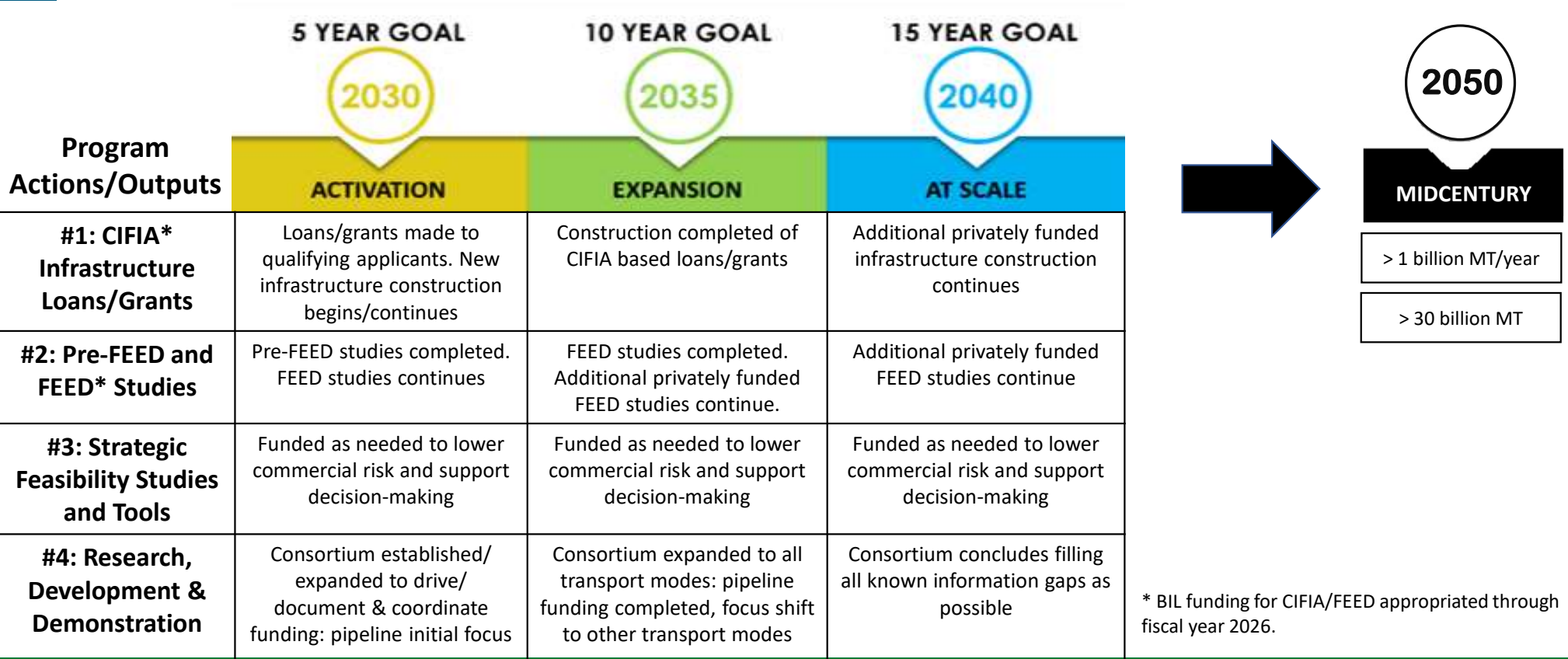
Carbon Dioxide Utilization, Transport, and Storage

- **Carbon Storage Validation and Testing: \$2.5 billion**
- Carbon Utilization Program: \$310 million

<https://www.energy.gov/fecm/solicitations-and-business-opportunities>



FECM Strategic Vision: Transport Actions/Outputs/Impacts

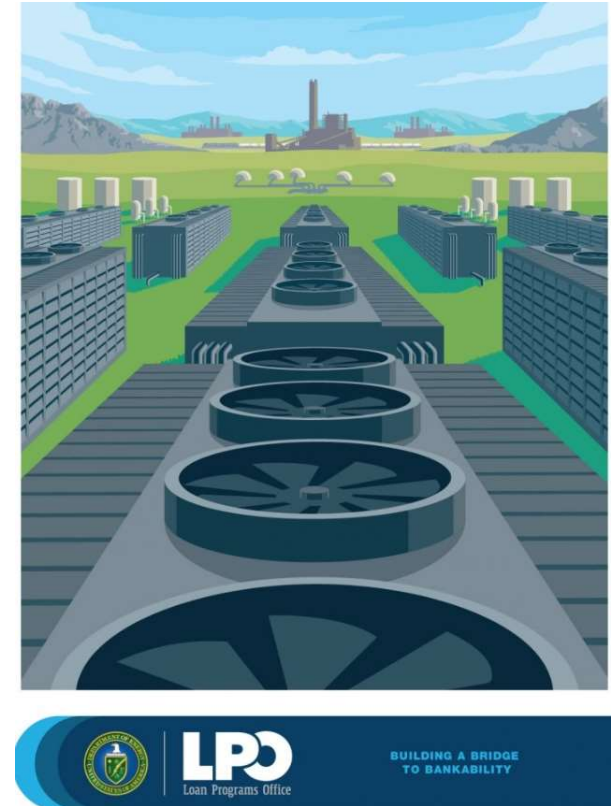


* BIL funding for CIFIA/FEED appropriated through fiscal year 2026.

CIFIA Carbon Transport Loans/Grants Program

CO₂ Infrastructure Finance & Innovation Act (CIFIA)

- CIFIA supports CCUS and DAC technology deployment by financing projects that build shared CO₂ transport infrastructure that should benefit from economics of scale
- BIL provides \$2.1 billion for CO₂ transport infrastructure projects including:
 - Secured loans and loan guarantees (“CIFIA Loans”)
 - Grants for building excess capacity on new and existing CO₂ infrastructure
- Managed via a partnership between DOE’s Fossil Energy and Carbon Management Office, DOE's Loan Programs Office, and the National Energy and Technology Lab
- Harry Warren, U.S. DOE, Loan Programs Office will speak more later this morning



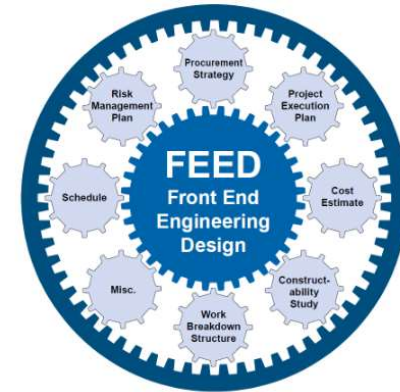
Pre-FEED and FEED Studies

Pre-Front End Engineering Design Studies:

- Supports conceptual design & development of commercial-scale, intermodal CO₂ transport HUBs
- HUB designs may include multiple integrated transportation modes, including but not limited to pipeline, rail, maritime, truck and facilitate offtake of CO₂ streams at various conditions and compositions.

Front End Engineering Design Studies:

- BIL provides \$100 million for carbon transport infrastructure FEED studies
- Accelerate the planning and development CO₂ transportation infrastructure by a variety of modes, such as through rail, trucks, ships, and pipelines



Courtesy: Valency

<https://www.energy.gov/fecm/solicitations-and-business-opportunities>

<https://www.energy.gov/fecm/project-selections-foa-2730-carbon-dioxide-transport-engineering-and-design-round-1>



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[energy.gov/fecm](https://www.energy.gov/fecm)

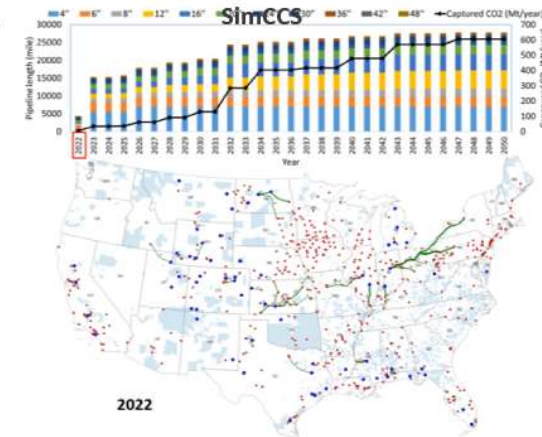
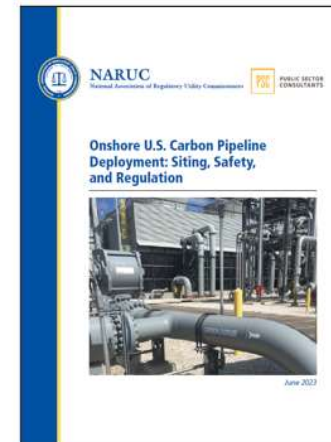
Strategic Studies & Tools

Feasibility/informational studies funded as needed to fill info gaps

- Onshore U.S. Carbon Pipeline Deployment: Siting, Safety, and Regulations authored by NARUC

User friendly models and tools

- **SimCCS** – Optimization software for integrated system design that enables researchers, stakeholders, and policy makers to design CCS infrastructure networks
- **Carbon Matchmaker** – Online information resource to connect users across the carbon capture, utilization, and storage (CCUS) and carbon dioxide removal (CDR) supply chains
- **TEA and LCA Models** – Carbon transport analysis tools to support early concept development and evaluation (in development)



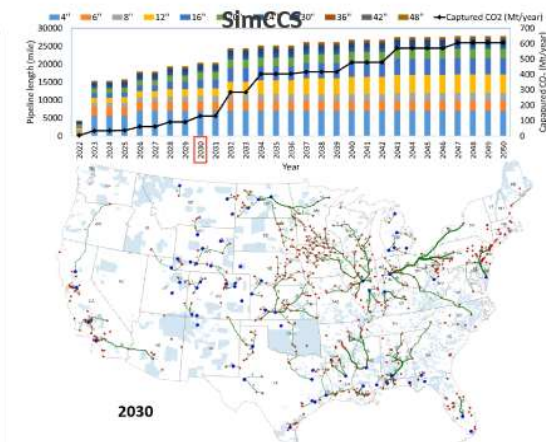
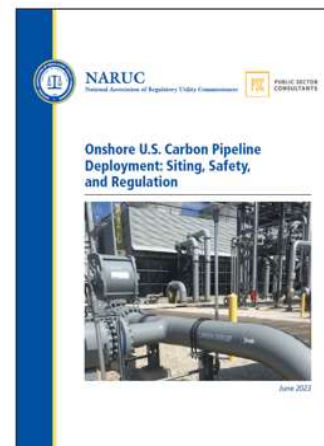
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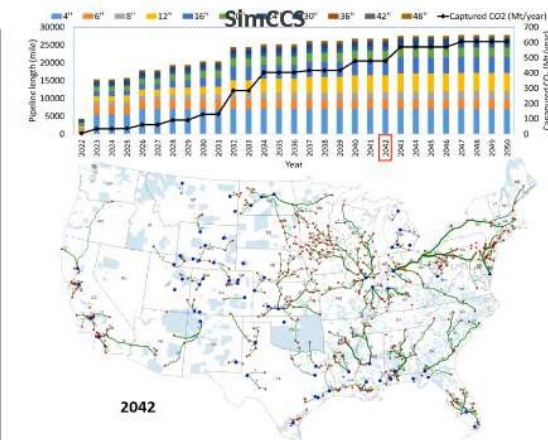
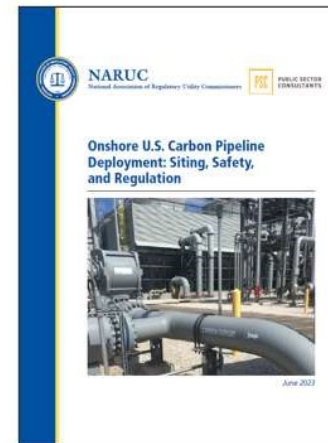
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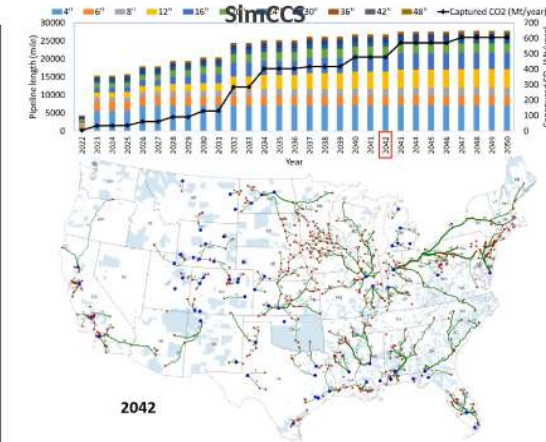
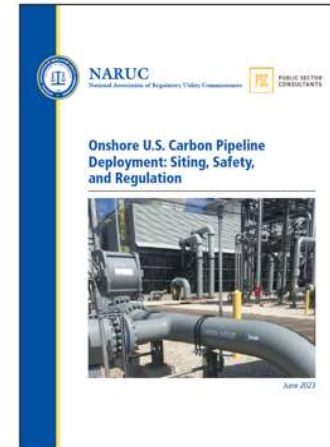
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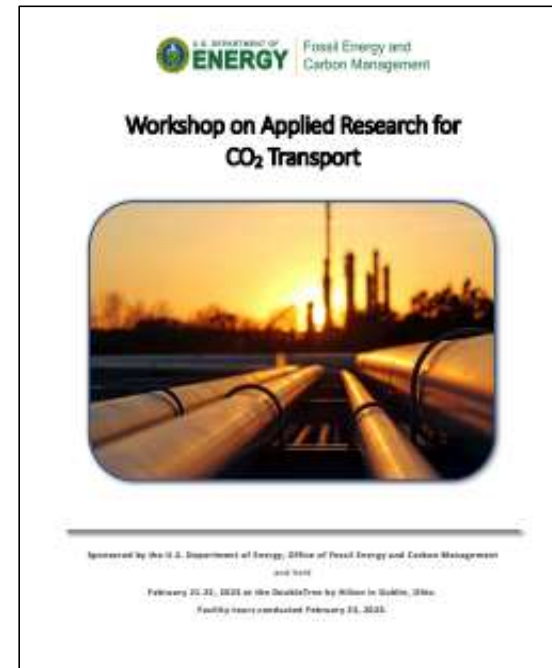
Research, Development & Demonstration

Summary Report: February 2023 Research Workshop

- Kevin Dooley, FECM will summarize during next agenda item

Key Takeaway #1: “Develop a CO₂ Transport Consortium”

- Suggested future consortium would intend to:
 - Identify and address technical barriers that will expedite transportation infrastructure deployment;
 - Connect and facilitate communication among any interested stakeholders;
 - Compile and curate CO₂ transport information in an open access platform.
- DOE will consider the insights from the consortium when planning future potential funding opportunities and collaborations with federal agencies, national labs, academia, private researchers, etc.



Interagency Collaboration to Expand CO₂ Transport Infrastructure

Interagency Carbon Transport Topic Team

- **Why Convene?**

- Administration/Congressional drivers - climate goals
- Reduce confusion; expedite statutory implementation
- Members can play a direct role and measure/track project progress

- **Purpose:**

- Share information and agency collected data
- Coordinate efforts on siting/permitting
- Support technical scoping of documents, peer review, and merit review during the pre-award



Future Outlook

CIFIA Loans/Grants:

- Implement and execute CIFIA loan and grant programs

FEED Studies:

- Implement and expand FEED studies (e.g., Multimodal & Intermodal applications)

Strategic Studies and Tools:

- Continue funding and developing as needed (e.g., LCA/TEA studies in development)

Carbon Transport Consortium:

- Pursue development and connect with stakeholders

Interagency Coordination

- Launch transport interagency team to connect and leverage expertise in transport



Courtesy NAP



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Thank You!

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