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Energy & Environmental Research Center (EERC)

#### A ROAD MAP FOR GROWTH OF COMMERCIAL CCUS PROJECTS IN THE UPPER GREAT PLAINS AND NORTHWESTERN REGIONS OF NORTH AMERICA

CCUS 2025

Houston, Texas March 3, 2025

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CRITICAL CHALLENGES. PRACTICAL SOLUTIONS. & Environmental

The EERC is a leader in developing new technologies and practical solutions to critical energy challenges.



# REGIONAL CARBON SEQUESTRATION PARTNERSHIP INITIATIVE

## **PCOR PARTNERSHIP**

2003–2005 – PCOR Partnership: Characterization

2005–2008 – PCOR Partnership: Field Validation

2007–2019 – PCOR Partnership: Commercial Demonstration

2019–2027 – PCOR Partnership Initiative: Commercial Deployment







INIVERSITY School of WVOMING Energy Resources







The PCOR Partnership Initiative addresses regional capture, transport, use, and storage challenges facing commercial CCS/CCUS deployment. The initiative focuses on:

- Strengthening the technical foundation for geologic CO<sub>2</sub> storage and enhanced oil recovery (EOR).
- Advancing capture technology.
- **Improving** application of monitoring technologies.
- **Promoting** integration among capture, transportation, use, and storage industries.
- **Facilitating** development of regulatory frameworks.
- Providing scientific support to policymakers.
- **Engaging** the public through outreach and education.

# PCOR PARTNERSHIP

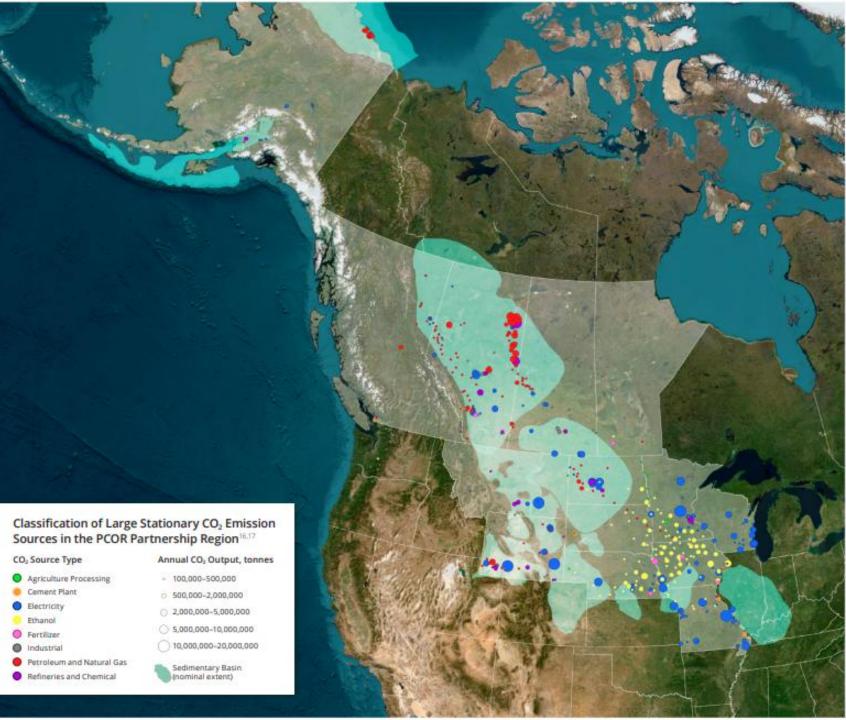
#### **2003 – Present**



#### Our partners inform our priorities.

PC	PARTNERSHIP <b>OPENERGY</b>							NATIONAL ENERGY TECHNOLOGY LABORATORY		EERC North Dakota. North Dakota Industrial Commission		Institute of Northern Engineering University of Alaska Fairbanks			UNIVERSITY of WYOMING Energy Resources			
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# CO<sub>2</sub> SOURCES AND SEDIMENTARY BASINS



Major emission sources are interwoven with the regional economy – acting as economic pillars.

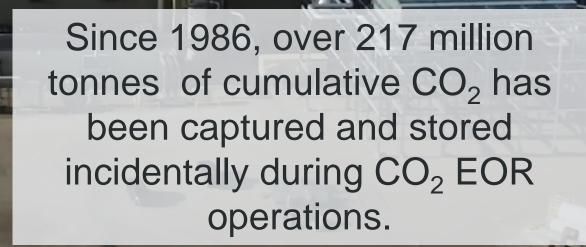
PETROLEUM AND NATURAL GAS

AGRICULTURE-RELATED PROCESSING

ELECTRIC UTILITY

INDUSTRIAL

## SHUTE CREEK GAS-PROCESSING FACILITY



100



### **DAKOTA GASIFICATION – SYNFUELS PLANT**

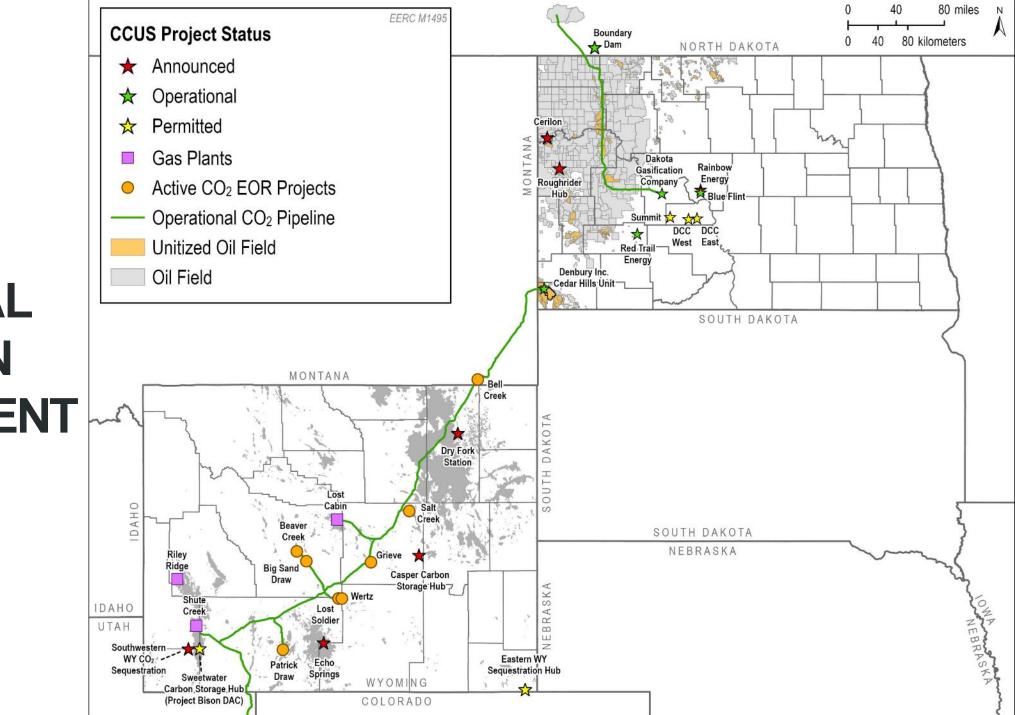
Since 2000, approximately 42 million tonnes of  $CO_2$  has been captured and stored incidentally at the Weyburn and Midale oil fields for  $CO_2$  EOR operations. In addition, beginning in February 2024, over 1 million tonnes of  $CO_2$  has stored via Class VI dedicated storage north of the plant.

# **BOUNDARY DAM CARBON CAPTURE PROJECT**

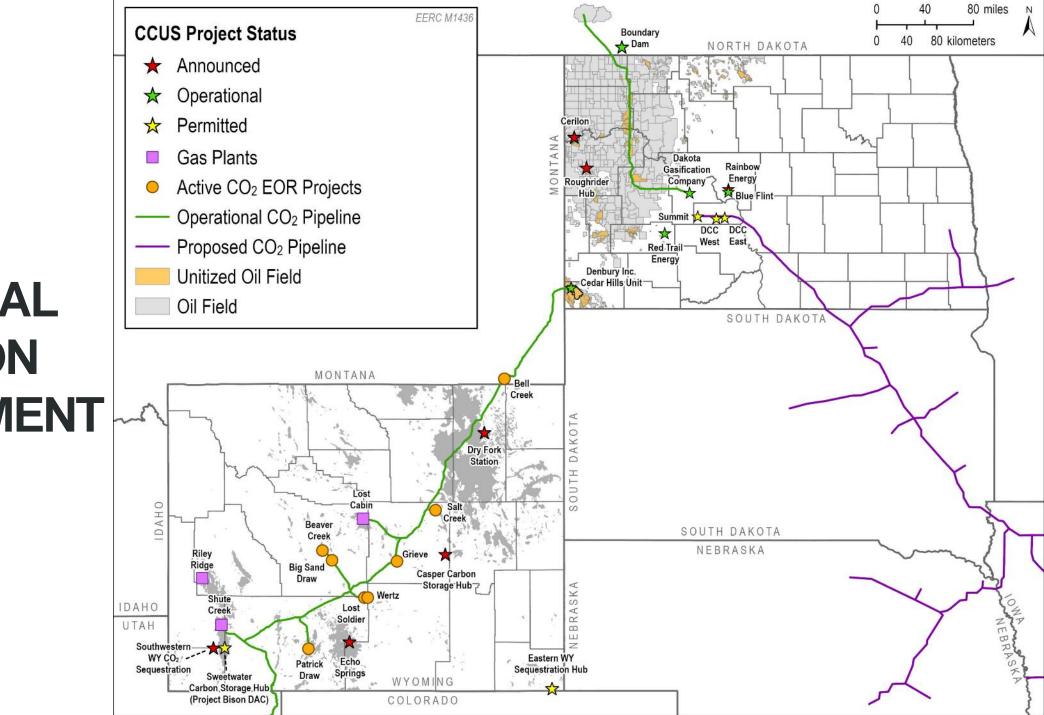
Since 2014, nearly 6.0 million tonnes of CO<sub>2</sub> has been captured from Boundary Dam and stored incidentally at the Weyburn CO<sub>2</sub> EOR operation and also permanently stored at Aquistore.

## SHELL QUEST CCS FACILITY

Since 2015, over 9.0 million tonnes of  $CO_2$  has been captured and stored (as of May 2024).



### REGIONAL CARBON MANAGEMENT



### REGIONAL CARBON MANAGEMENT

# ND CCUS PROJECTS

ANNOUNCED, PERMITTED, AND OPERATIONAL

#### Operational

- Red Trail Energy Ethanol: 180 Kty to saline
- Blue Flint Ethanol: 200 Kty to saline
- DGC Coal gasification: 2.7 Mty to saline
- Denbury Cedar Hills Gas plant: 1 Mty to EOR

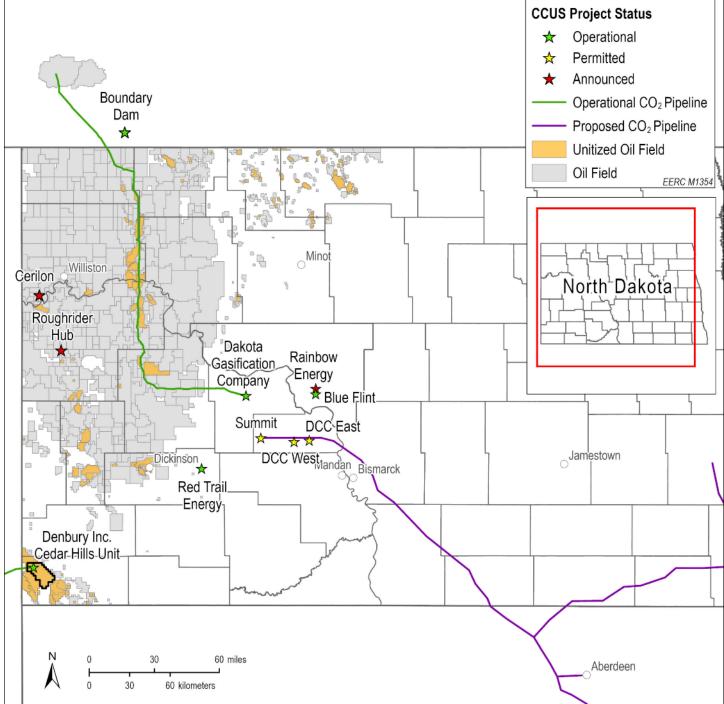
#### Permitted

- DCC East (Project Tundra) Coal power plant: 5 Mty
- DCC West Coal power plant: 6 Mty
- Summit Multiple ethanol plants: 18 Mty

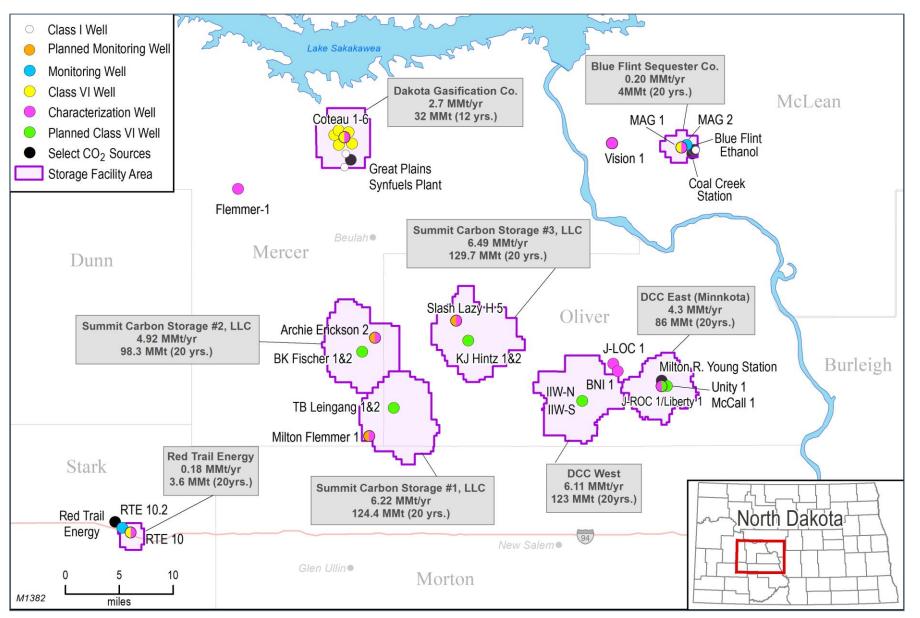
#### <u>Announced</u>

- Rainbow Energy Coal power plant: ~9 Mty
- Roughrider Hub Multiple sources
- Cerilon GTL North Dakota





## **PERMITTED ND SALINE STORAGE PROJECTS**



# **REGIONAL LEADERSHIP**

- **Building** on over 20 years of applied research in CCUS.
- Active region developing commercial CCUS projects.
- Engaged and motivated partners.
- Engaged regulators.
- Catalyst for CCUS projects in the region.
- **Focused** on infrastructure development strategies.
- Accelerating CCUS.
- **Expanding** CO<sub>2</sub> EOR opportunities in the region.





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