




**Stacey Dahl**  
**Senior Manager of External Affairs**

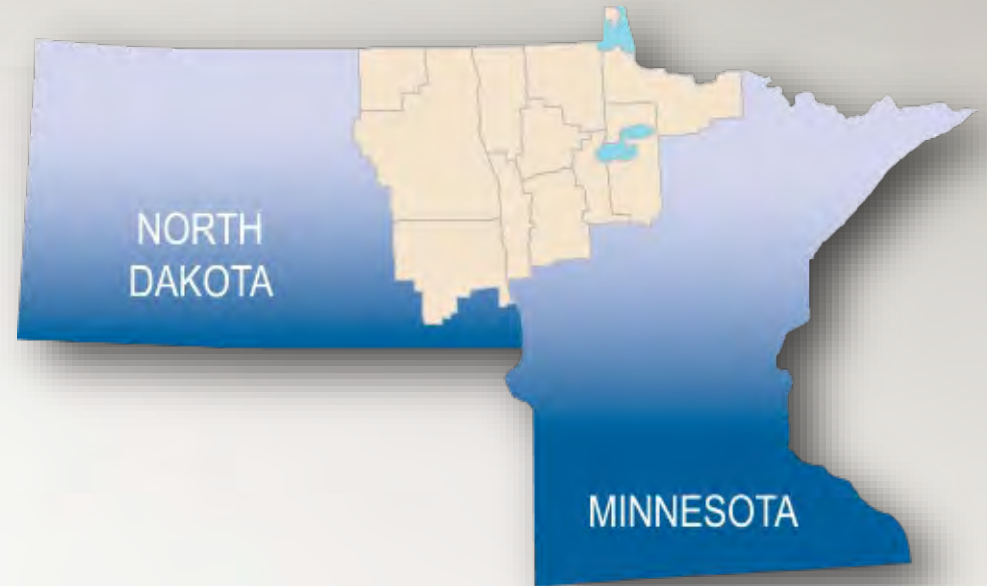


**Minnkota Power**  
**COOPERATIVE**

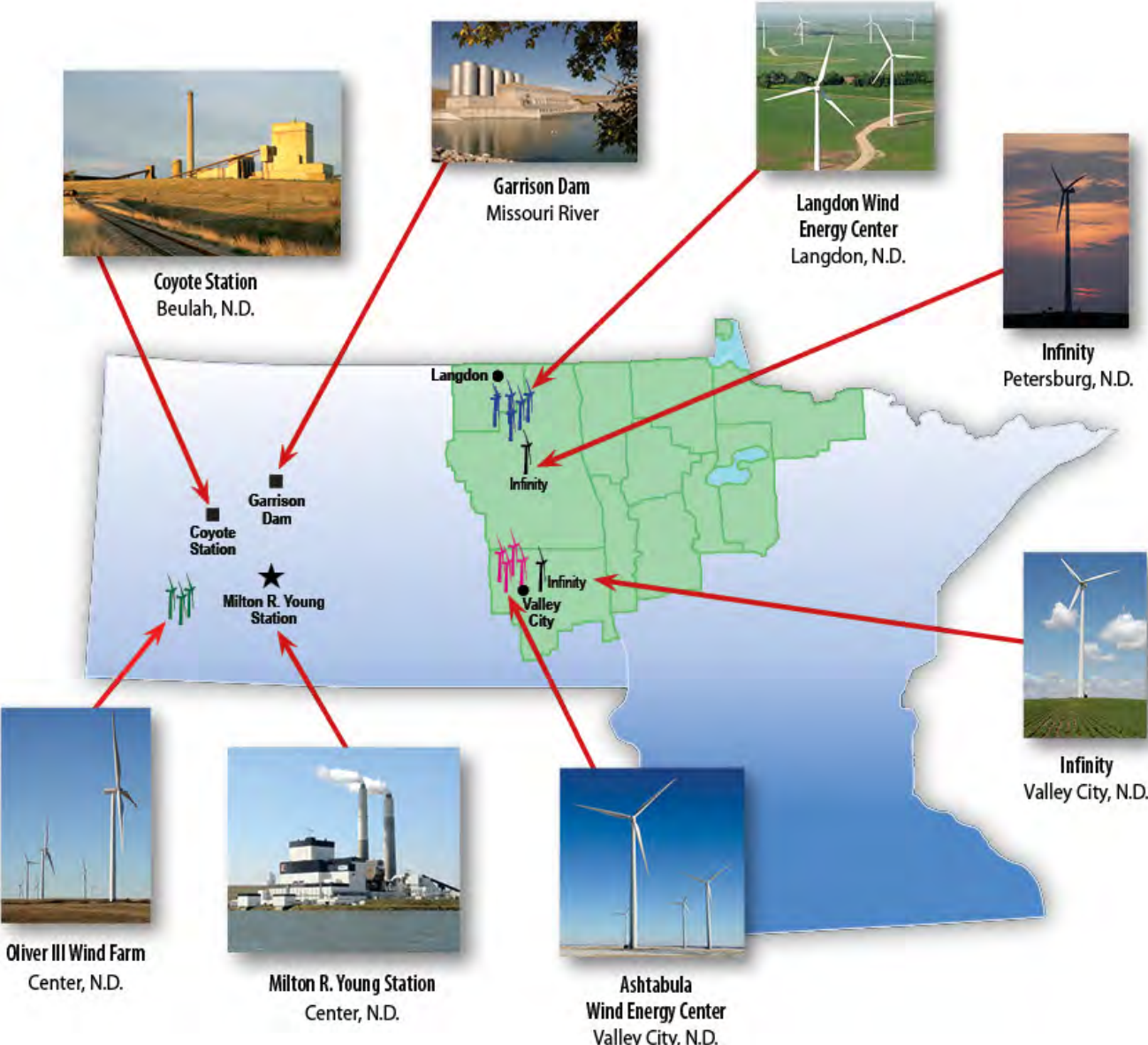
A Touchstone Energy® Cooperative 

# Who We Are

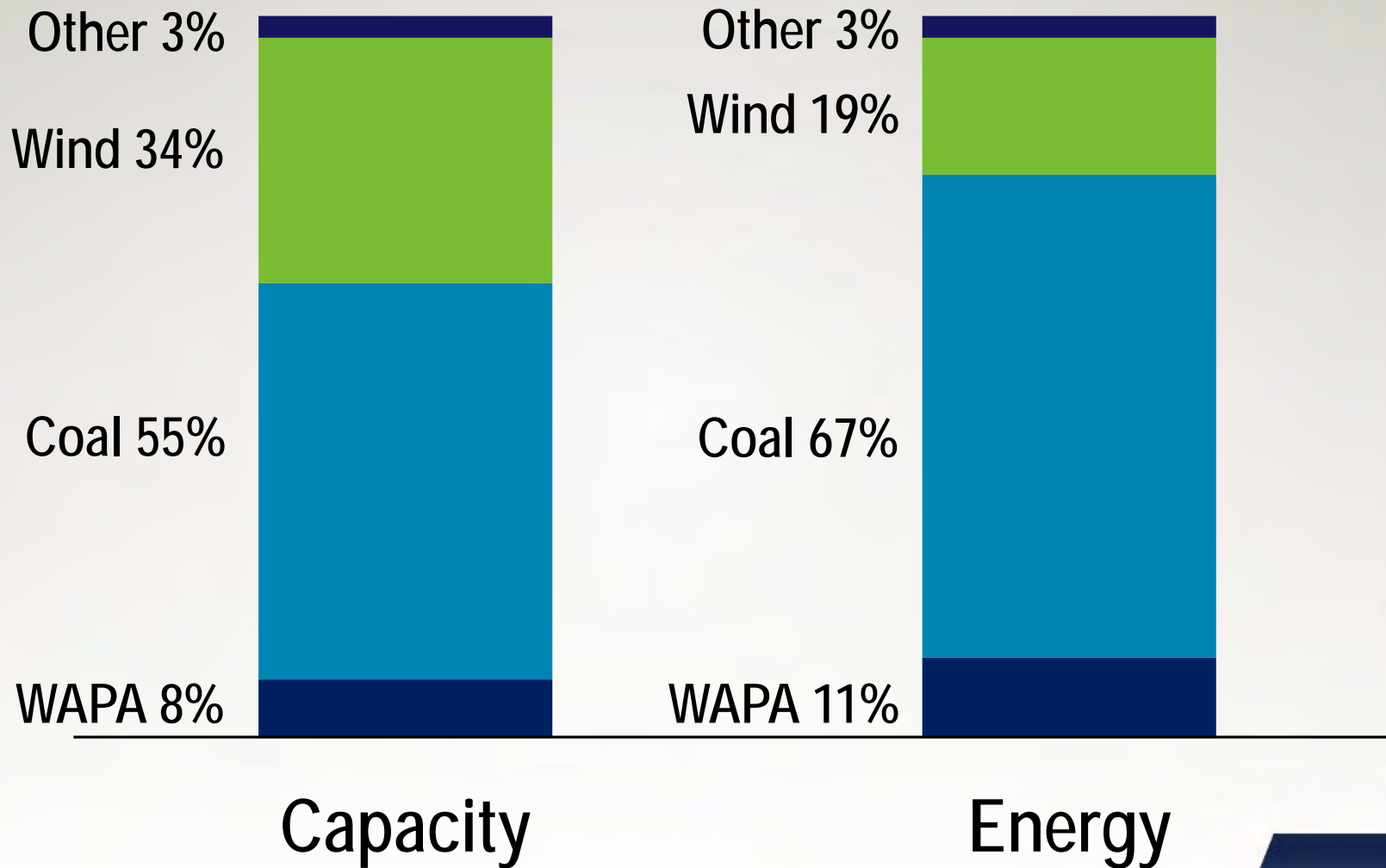
- Wholesale electric generation and transmission cooperative headquartered in Grand Forks, N.D.
- 11 member-owner cooperatives
- 3 in ND, 8 in MN
- 12 municipals – Northern Municipal Power Agency
- Serve 35,000 square miles in 33 counties
- About 150,000 consumers
- 390 employees



# Generation Resources



# 2017 Joint System Resources



# Living in a carbon-managed world

- Society increasingly demands carbon-free energy
  - IPCC report
  - White House report
- Intermittency of renewable generation requires some form of backup
  - Natural gas
  - Nuclear
  - Hydro
  - Coal
  - Future of batteries?
- While there is less pressure with the current administration, we believe we will live in a carbon-managed future
- North Dakota coal facilities are in a unique position
  - Nearby Williston-Basin oil formation
  - Unique geology





# Our Common Vision

## Value

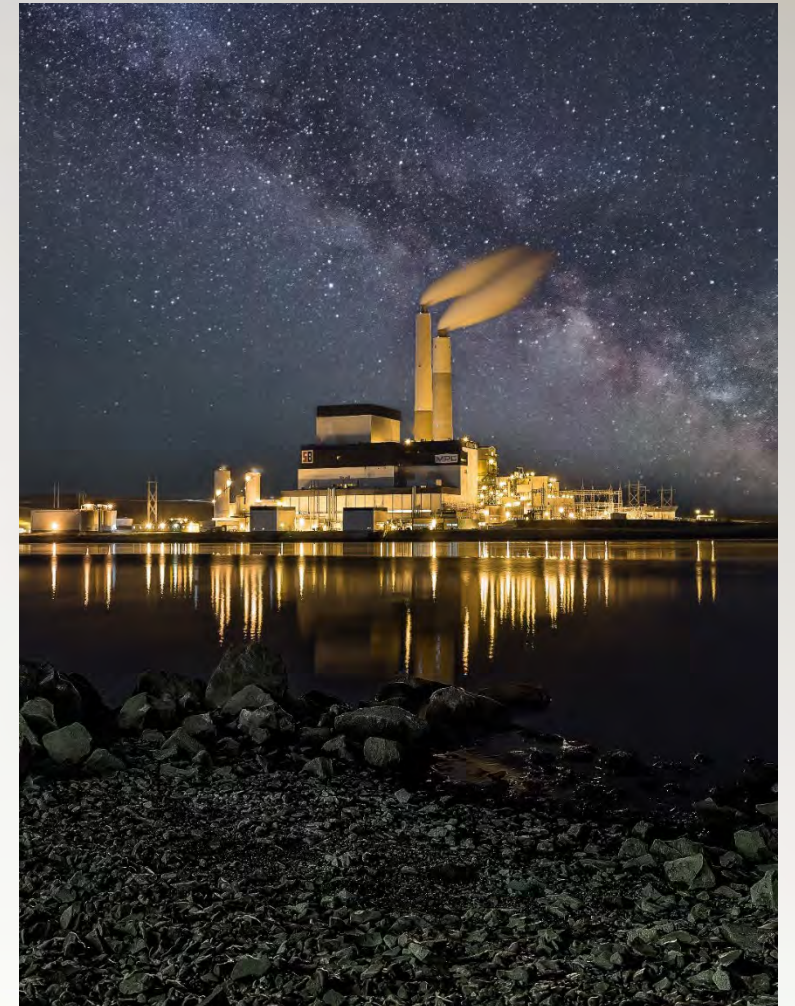
- Unlock value of North Dakota oil production
- Enhance value of local lignite resources
- Transform state CO2 emissions landscape
- Preserve value of state electric generating units
- Utilize Energy Corridor for CO2 transport – future optionality for other products

## Development Plan

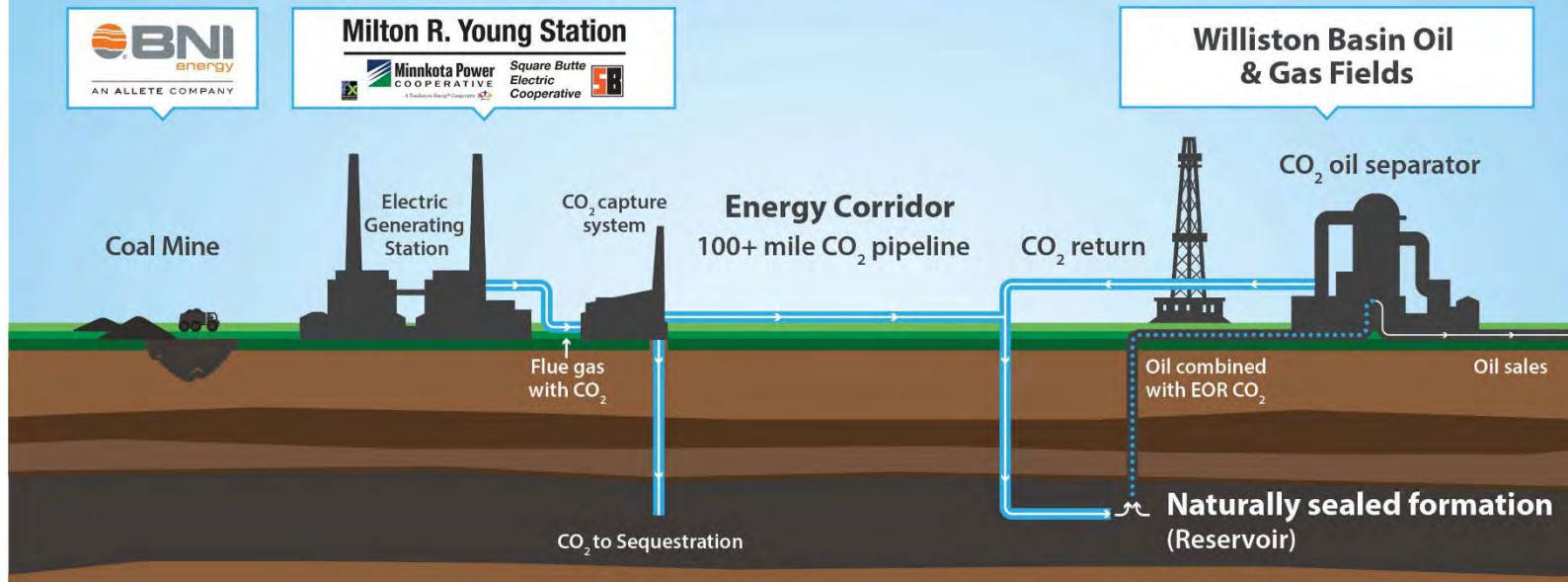
- Develop technology and offtake solutions
- Work with State of North Dakota officials and key stakeholders on financial and policy project support
- Build upon already established federal support
- Align project for outside investment

# Project Tundra

- Equip Unit 2 at the Milton R. Young Station with amine-based technology to capture up to 95 percent of the unit's carbon dioxide (CO<sub>2</sub>) emissions
- CO<sub>2</sub> to be used for Enhanced Oil Recovery (EOR) or simple permanent underground storage
- In the EOR application the CO<sub>2</sub> would be transported through a 100+ mile pipeline to be used to recover oil that is otherwise stranded and unrecoverable
  - CO<sub>2</sub> has been proven to substantially increase production in declining fields – 45 years of history
- In the storage application the CO<sub>2</sub> will be injected in saline formations near the plant property that has been proven to provide permanent storage.



# Utility Industry Carbon Solutions—Project Tundra



Project Tundra  
Development  
Pathways

Develop Business Structure

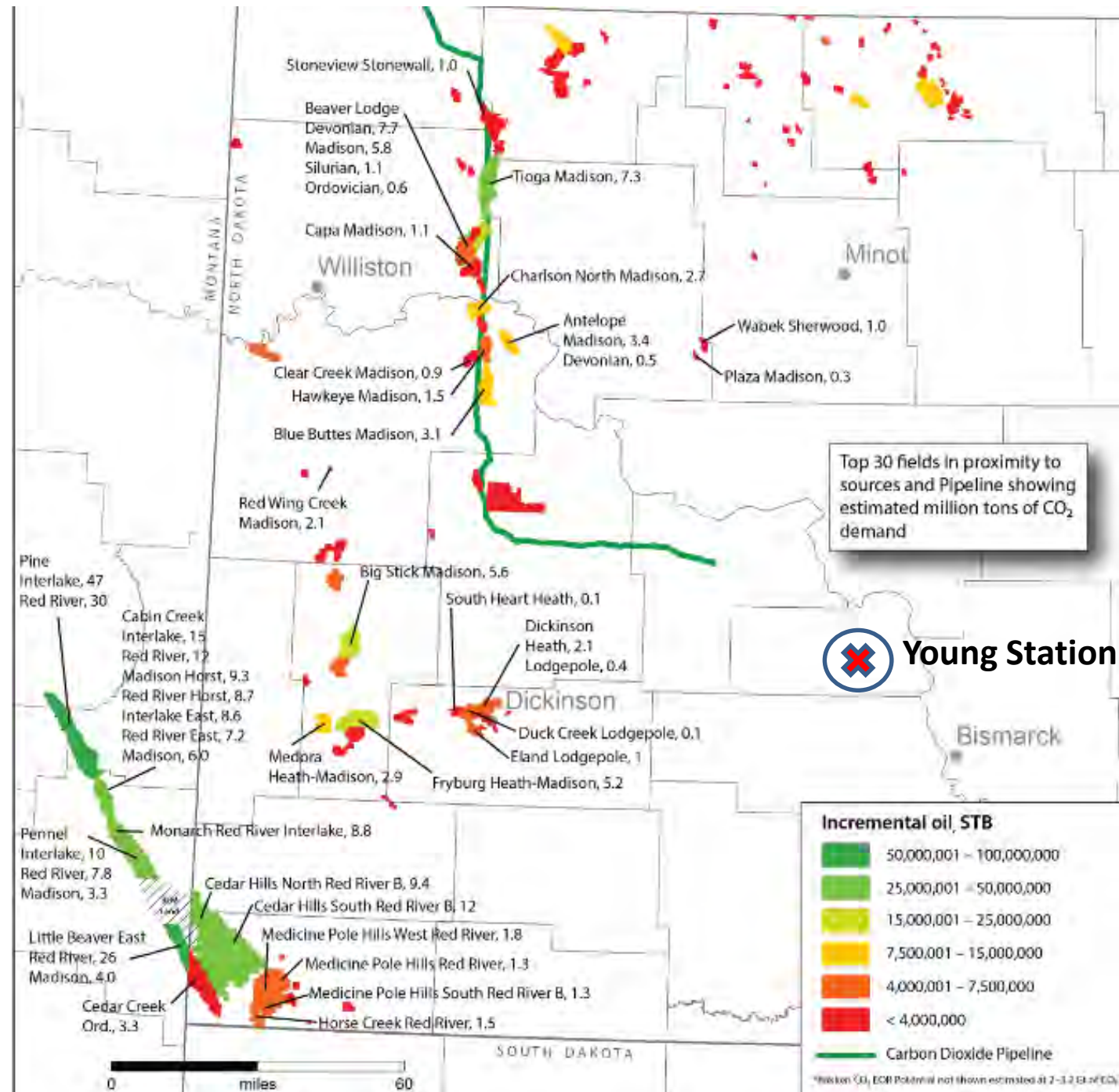
State and Federal Policy Support

Secure CO<sub>2</sub> Source

Secure CO<sub>2</sub> Sink



# Oil Field Target Project Tundra



# Petra Nova Project

- Texas project that Project Tundra is modeled after
- Operational in December 2016
  - On time and on budget
  - 1300% increase in oil production





# Our People are the Experts

- Project research is being led by the Energy & Environmental Research Center (EERC) at the University of North Dakota
  - Recognized as leading experts in Carbon Capture and Utilization projects
- David Greeson
  - Former Vice President of Development for NRG Energy, Inc.
  - Petra Nova was his vision and he led the project from inception through design, financing, construction, and commissioning

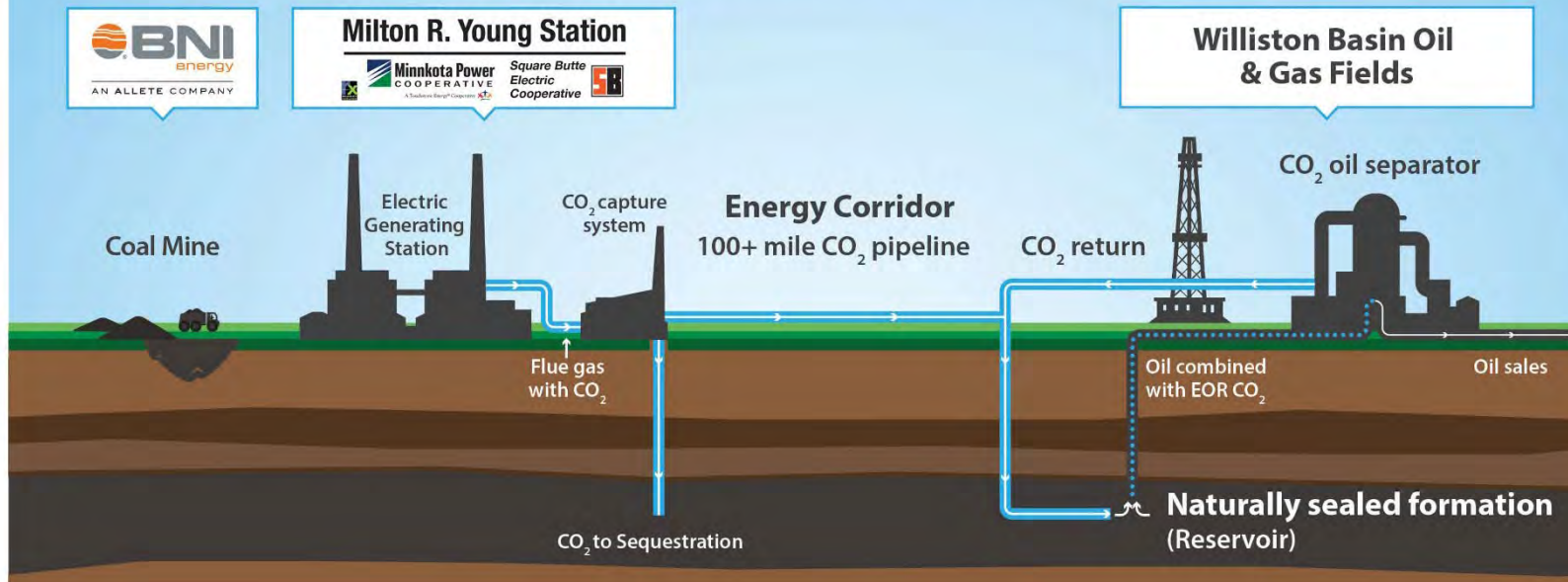


# 45Q Changes Everything

- Increased incentives for capturing CO2
  - Signed into law in February 2018
- \$35 per ton of CO2 used for Enhanced Oil Recovery
- \$50 per ton of CO2 permanently stored underground
- Represents up to \$1 billion to Project Tundra
- However, Minnkota cannot monetize these 45Q Federal Income Tax Credits – means we will need a partner
- Expect tax equity market to be interested:
  - 45Q deals will be ramping up while wind and solar tax credits phase out
  - Opportunity for multiple 45Q deals
    - Coal-fired power plants
    - Ethanol plants, fertilizer plants, cement, and others



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Critical Challenges. **Practical Solutions.**



# THANK YOU

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# Questions?

