Southern States Energy Board
Wednesday, May 20, 2015

Commissioner Brian Kalk
North Dakota Public Service Commission
www.psc.nd.gov
Overview

- Background
- Opportunity in North Dakota
- Empower North Dakota
- Lignite Coal
- Path Forward!!
Background

-Born & raised in North Dakota

-U.S. Marine Corps Retired

-Professor at North Dakota State University

-Elected to ND Public Service Commission (2008 & 2014)

-NARUC “Chair of the Clean Coal Cmte – Jon McKinney”
Where is North Dakota??

Regional Map of U.S. & Canada

This map represents a general outline of Regions.
Opportunity in North Dakota
Energy Situation

- Coal Generation is on the range of 4300 MW
- Hydroelectric Power (Garrison Dam) 510 MW
- Wind Power (PSC approved over 2000 MW) built ... 1250 MW
- Natural Gas (PSC approved over 700 MW) built ... 400 MW
- ND “needs” another 2500-3000 MW in next 20 years.
Energy Situation

- MISO & SPP are the RTO’s in our area.

- 2nd largest oil producer in the U.S. (1.2 Million Barrels a day)

- Less than 10% of the oil in North Dakota is being “recovered”

- Natural Gas processing plants (by product of the oil wells)

- CO2 has been used for EOR in our region for 30 years.

- Several companies are exploring how to expand CO2 use.
Wind Potential & Transmission Lines

North Dakota - Wind Resource Map

Wind Power Classification

- Wind Power Potential
- Wind Power Density at 50 m
- Wind Speed at 50 m
- Wind Speed at 50 m

Wind Power Classification:
- Marginal
- Fair
- Good
- Excellent
- Outstanding

Transmission Line Voltage:
- 69 Kilovolts
- 115 Kilovolts
- 230 Kilovolts
- 345 Kilovolts
- Under Construction

Indian Reservations:
1. Turtle Mountain
2. Devil's Lake Sioux
3. Lake Traverse
4. Standing Rock
5. Fort Berthold

U.S. Department of Energy
National Renewable Energy Laboratory

Meteorological Station with Wind Data
City or Town

Wind speeds are based on a Weibull k value of 2.0
Empower ND

- Established by the ND Legislature to bring energy representatives together that would lead to growing state’s energy interests. (prior to oil & gas revolution)

- Political Philosophy in North Dakota.
Coal is important to North Dakota

- Provides for 15,000 direct and indirect jobs; supported by both political parties.

- 2 million people in the upper plains states depend on North Dakota-generated electricity for their low-cost, dependable power

- Fifth largest industry in the state; $100 million annually paid in state taxes
Technical

– Composition of lignite versus PRB subbituminous
  - Higher ash, higher moisture, lower BTU
  - Potential solution: DryFining™
Technical

– Lack of export potential

- Mine-mouth ND power plants
- Exception is Spiritwood Station (beneficiated coal)
- No ND lignite is sold outside state boundaries
Technical

- Lignite is volatile fuel source
  - Best suited for gasification
  - Gasification is pathway to polygeneration
    - Syngas, liquid fuels, chemicals, hydrogen
    - Allam Cycle uses supercritical CO2; higher efficiency; near zero emissions
Technical

– ND has potential for EOR

- Geology is ideal for enhanced oil recovery
- Coal reserves are near existing oil producing basins
- Existing CO2 pipeline infrastructure
Regulatory

– Clean Power Plan for Existing Plants

- EPA is attempting to establish national energy policy with unrealistic timelines

- Three of four building blocks in CPP are ‘outside the fence’ and beyond EPA jurisdiction…. Litigation…..litigation……
Regulatory

– Waters of the USA

- Like CPP, CWA rule would increase EPA’s oversight of waters beyond previous ‘navigable waters’

- ND Congressional Delegation opposed to expansion
Regulatory

– Federal coal leases

  - Nearly impossible to secure federal coal leases

  - Solution is increasingly eliminating federal leases from mining plans; private leases are plentiful and often more affordable
Environmental

– ND Lignite R&D program

- Unique state/industry partnership established in 1980s to provide funding for lignite R&D programs

- Energy & Environmental Research Center provides premier low-rank coal technology expertise
Environmental

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Environmental

– Carbon dioxide

- DOE and EPA differ on timelines for commercially available CO2 capture technology

- ND lignite industry is fully engaged both domestically and internationally
Final Thoughts

- We needs more baseload power. *(KEMPER II in North Dakota!)*

- Only a small portion of North Dakota oil is being recovered.

- EOR is being used and will be used on larger scale.

- Policy makers and coal companies can’t “give up” the fight.

- Coal is a strategic resource that must be used, if we are ever going to truly have energy security.
Questions & Thank You!

North Dakota Public Service Commission
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Commissioners

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