Margaret Hodnik, Vice President, Regulatory and Legislative Affairs
Minnesota Power/ALLETE
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Balancing Act: Transition Amid Uncertainty
Themes for Today’s Conversation

• Other forces driving change—not just EPA
• Energy change is complex—to get it right
• “All of the above” choices required
• State policies key to success
• Regional strategies optimize results
• Research/innovation required
• Draft EPA rule contains big problems
is predominantly a regulated utility with complementary infrastructure / service businesses
Industrial customers critical to regional economy, very cost sensitive
Power Industry Change Agents

- Mercury and Air Toxics Standard
- Clean Power Plan Rule Unfolding
- Ongoing Uncertainty With Rulemaking

Fuel Supplies
- Abundant natural gas
- Renewable accessibility
- Life cycle considerations

Regional Energy Market
- Low regional market prices
- Transmission growth
- Market sophistication

Regulatory Policy
- Expanding Footprint
- New Products
- Renewables Expansion
- Technology Evolution

- Shale Gas Supply
- Transforming Long-Term Outlooks
- Gas-Electric Market Alignment
- Technology Enablers
Fleet Change Drivers

- Market Purchases
- Gas
- Renewable
- Coal

MORE
- Flexible
- Diverse
- Efficient

LESS
- Emissions
- Fixed Cost
- Carbon

EnergyForward

Plan

- Retain Affordability
- Retain Reliability
- Reduce Environmental Impact

“Sweet Spot”
Strategic Steps – Balanced Transition

- Newest Coal Units with Greatly Reduced Emissions
- High Quality Wind Energy
- Canadian Hydro
- New Coal Technology R&D
- Gas Combined Cycle
- Transmission Investments
- Distributed Generation/Advanced Grids
- Strong Energy Conservation

“All of the Above” Required
Change so far at Minnesota Power

2005
- Coal 95%
- Hydro 4%
- Biomass 1%

Current Long Term Planning Line Up
- Coal 42%
- Natural Gas and Market 29%
- MHEB 250 MW 10%
- Wind 12%
- Hydro 4%
- Biomass 3%

2013
- Coal 65%
- Market Purchases 15%
- MHEB Short Term 5%
- Wind 11%
- Hydro 2%
- Biomass 2%

• Goal: 1/3 renewable, 1/3 coal, 1/3 natural gas
Other Key Ingredients for Transition Success

- Effective State Energy Policies
- Regional Supply Strategies
- Technology Research and Innovation
Policies Drive Varied Actions

Minnesota
• Mercury Reduction Act
• 25% Renewable Energy Standard/1.5% Solar Standard
• 1.5% Annual Conservation Standard
• Transmission Policy

North Dakota
• Broad-based Research Funding
• EmPower Commission
• CO$_2$ for EOR Policy
• Transmission Policy
Regional Strategies = Lower Consumer Costs

North Dakota Wind Paired with Canadian Hydro Serving Minnesota Customers

HVDC Line +/- 500kV (850 miles)

HVDC Line +/- 500kV (600 miles)

12 Regional Strategies = Lower Consumer Costs
Paired Resources = Large Scale Energy Storage

• “Excess” wind energy from Minnesota Power wind farm in North Dakota can be stored in Manitoba Hydro’s system.

• New international transmission line—“GNTL”—facilitates storage of wind energy.
Research/Innovation = Energy Solutions

R&D—for all energy types—a cornerstone of North Dakota energy policy

**Coal research value**
- Baseload energy security
- Global fuel use
  - Carbon solution needed for global climate success

**Lignite Research Council leadership**
- $5 million annual budget
- Innovative, high impact R&D

**Industry to industry collaboration**
- CO$_2$ for EOR policies/research engages both coal and oil
Transition with Balance Required ... But ...

*Clean Power Plan Rule contains major monkey wrenches:*

- Early Action Investment Negated
- Major Emission/Energy Math Errors
- Incorrect Natural Gas Assumptions
- Out of State Renewables Issues
- Reliability Concerns
- Wholesale Energy Markets Not Understood

... Reliability and Affordability at Risk.
Conclusions

• Complex transition—sound decisions/pacing needed
• “All of the above choices” = flexible, economic solutions
• State policies and regional approaches can drive best outcomes
• Research and innovation required
• EPA carbon rule must reflect reality of utility investment, resource planning, energy supplies and energy markets
Thank You!