

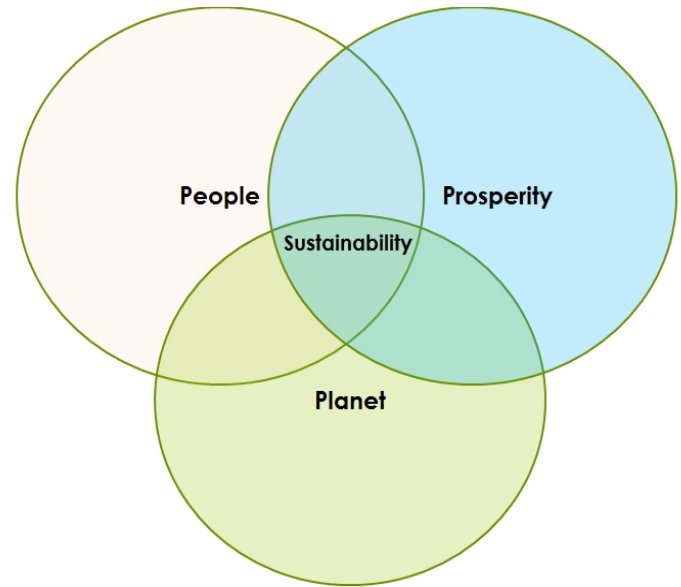


# Excellence Across Borders: An Energy Company's Perspective

Kurt Anderson, Director of  
Environmental & Land Management  
Minnesota Power

# Starting with...Conclusions

- Energy companies are key players in ensuring excellence (in air, water quality) across borders
- ALLETE takes a balanced stakeholder approach to deliver excellent, sustainable results
- Major transformation in business mix and source of energy in past decade







**ALLETE is an Energy Company**

ENERGY. IT'S OUR BUSINESS.

- Strategic Business Development/Acquisitions
  - ALLETE Clean Energy (ACE)
  - US Water Services
  - ALLETE Renewable Resources
- Increase in renewables
  - MP and ACE
- Small coal reduction
- Environmental retrofits



# ALLETE Clean Energy (ACE)



ALLETE Clean Energy specializes in developing, acquiring and managing clean and renewable energy projects.

We seek opportunities to develop or acquire mid-size capital projects for electric utilities, cooperatives, municipalities, independent power marketers and large end users across North America. We're open to all types of business relationships including joint ventures and projects fully owned by ALLETE Clean Energy or our customers.

Press Release:  ALLETE Clean Energy announces \$80 million turbine refurbishment initiative. 8/2/2017

Press Release:  Second 2017 shipment of ALLETE Clean Energy turbine parts arrives. 5/17/2017

Press Release:  ALLETE Clean Energy, Xcel Energy sign 100 MW power purchase agreement for new North Dakota wind farm. 3/16/2017

Press Release:  ALLETE Clean Energy plans expansion of North Dakota wind farm. 1/3/2017





**U.S. WATER**  
The **future** of water™

Integrated Water Management for Industry

About U.S.  
Water

Industries  
Served

## Leaving the World A Better Place with Better Water.

U.S. Water is committed to sustainable solutions for our customers. Our goal is to provide customer a superior environmental return on investment (ROI) that enhances the sustainability of your business. With our services, we can eliminate or reduce the threats to businesses from discharge restrictions by using water and energy more efficiently while enhancing production output.

We were committed to sustainability even before it became a popular way to describe what we do. U.S. Water believes innovative water and process management is crucial to solving the environmental, social and economic issues that face us



### Green Initiatives

Whether sustainability means meeting compliance restrictions, reducing energy and water consumption, getting LEED certified or even just cutting down on your environmental footprint, U.S. Water can help.

### PhosZero

*An Innovative and Balanced Scale and Corrosion Control Solution*

The PhosZero™ family of cooling water treatment products are designed to provide scale and corrosion control results similar to "traditional" phosphorus containing chemistries, but without the discharge or aquatic toxicity concerns of older technologies.

U.S. Water's latest generation of PhosZero™ contains E-FeX™ Technology, a synergistic blend of ingredients that replaces the most common uses of phosphorus in cooling water applications. Corrosion control is promoted by the formation of an adherent iron oxide



# Minnesota Power Environmental Achievements

- Air pollutant reductions
  - Boswell Unit 3
  - Boswell Unit 4
  - Small coal actions
- Wastewater reductions
  - Laskin: Mercury treatment
  - Hydropower reservoir research
- Renewables
  - Bison Wind Energy Delivery to MN
  - Manitoba Hydro
  - Largest hydropower generation in state of MN
  - Solar project at Camp Ripley



# Minnesota Power Renewables



# Giving Back...

## Adopt an Island

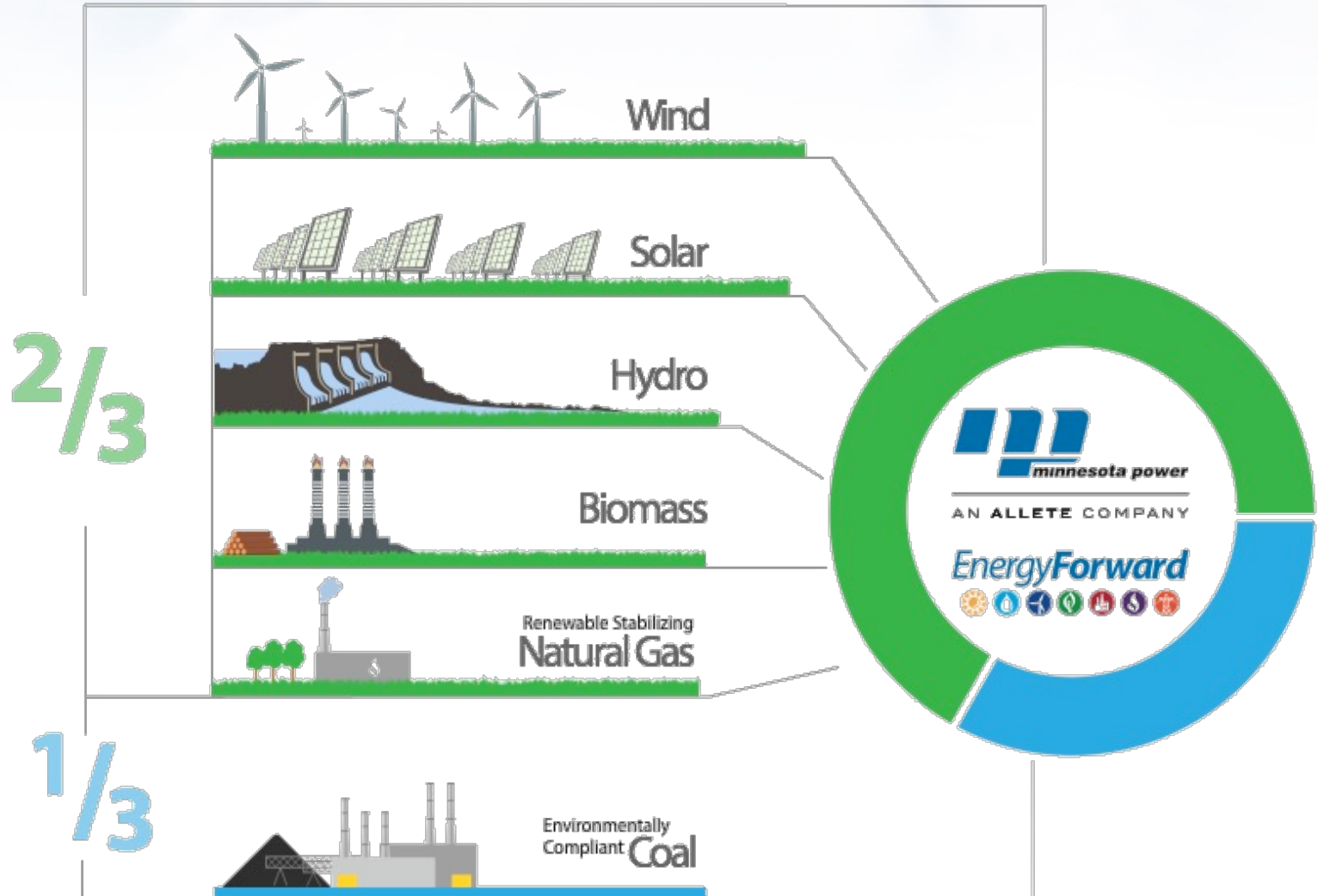


# *What's Next?*

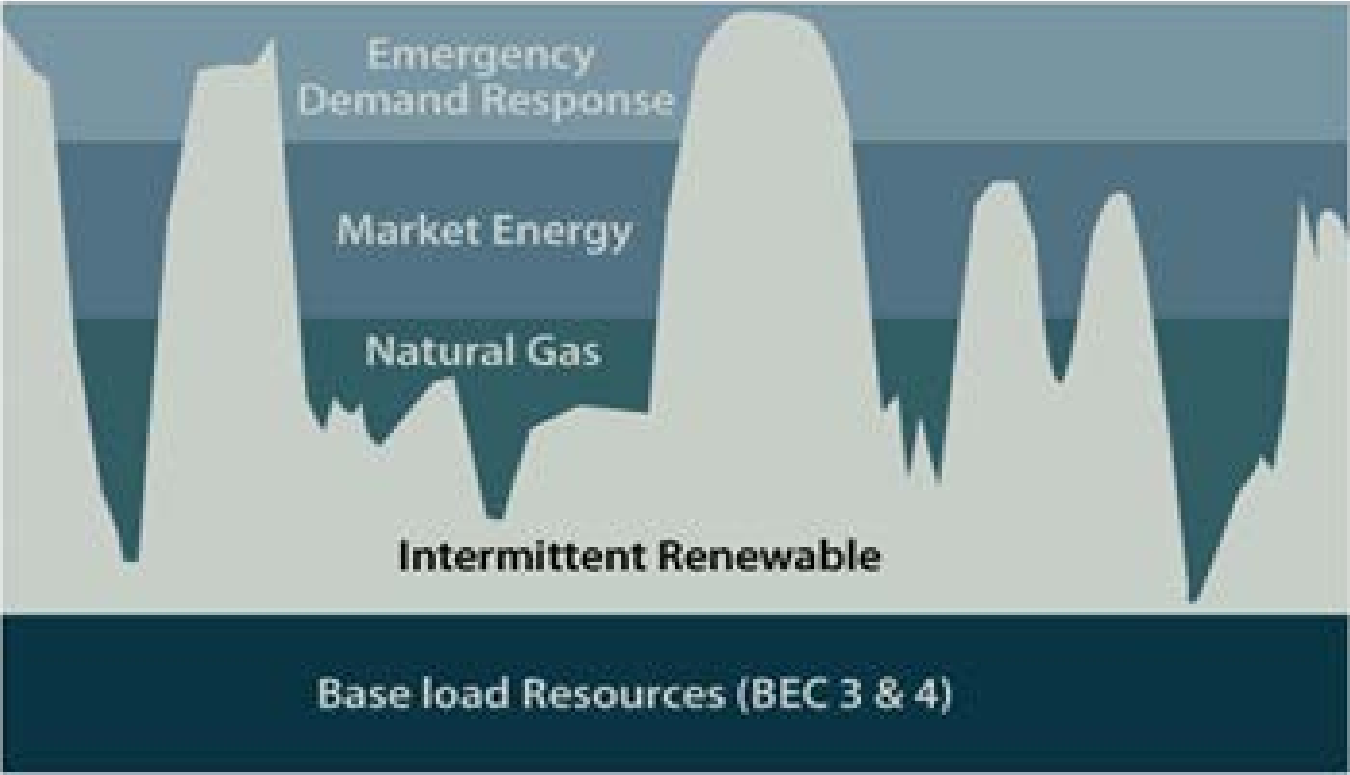
## EnergyForward Resource Package



# Evolving EnergyForward

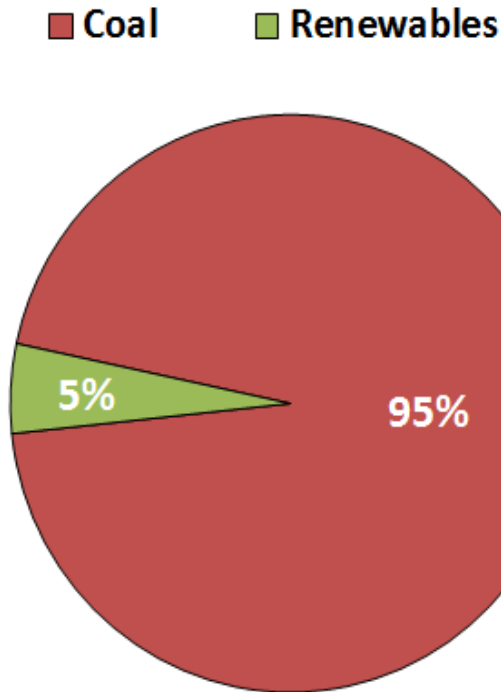


# Balancing Variable Renewable Resources with Flexible Generation

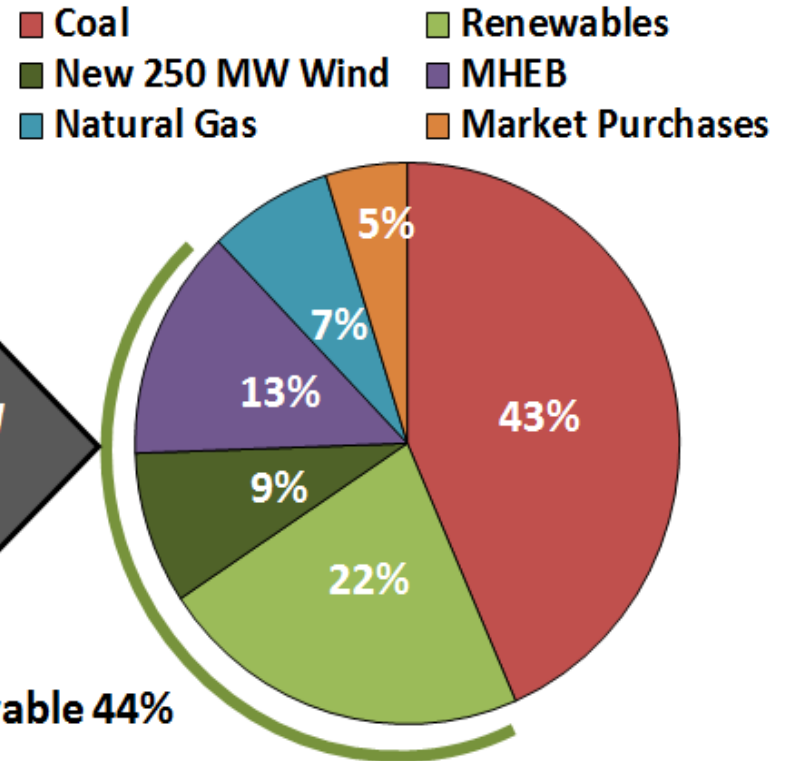


# EnergyForward Power Supply Transition

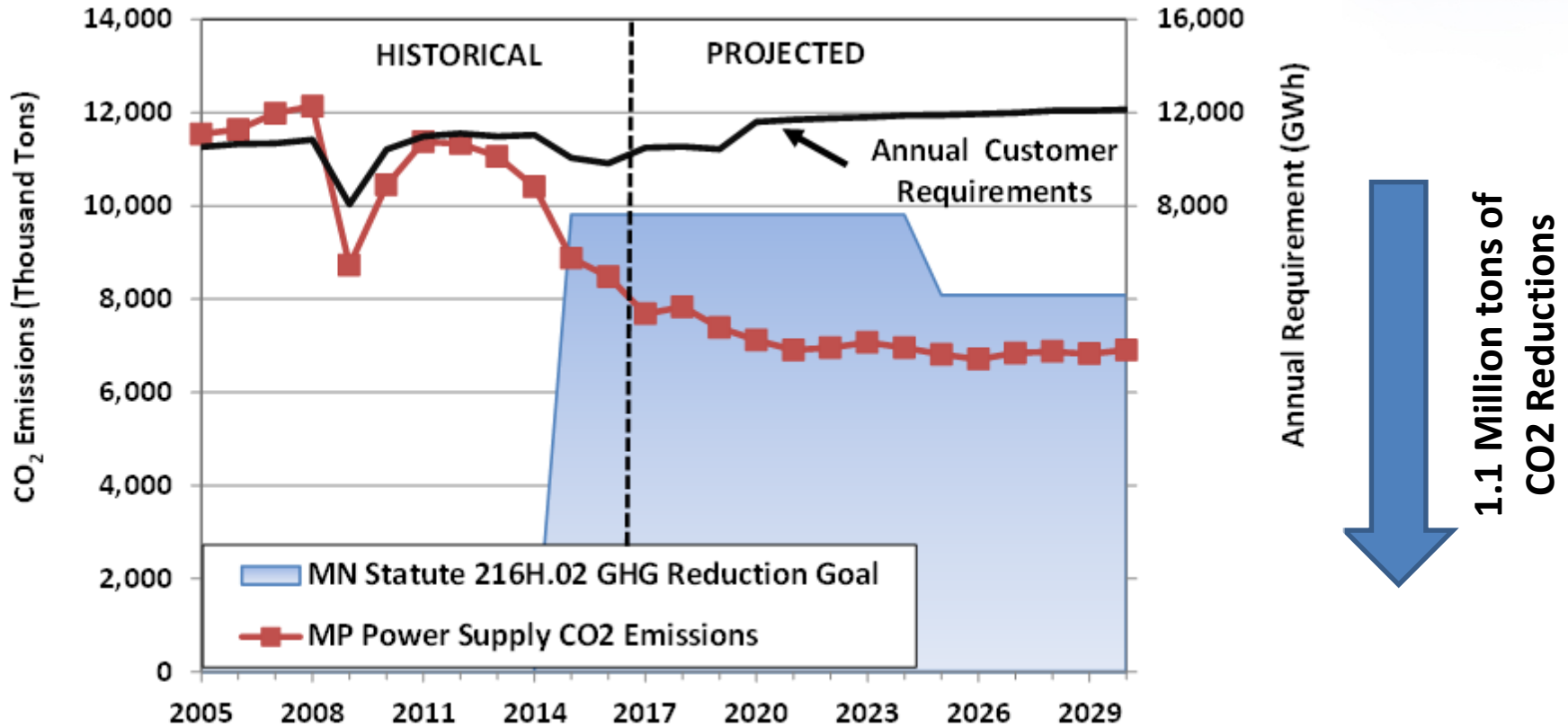
## Power Supply Mix in 2005



## Power Supply Mix in 2025



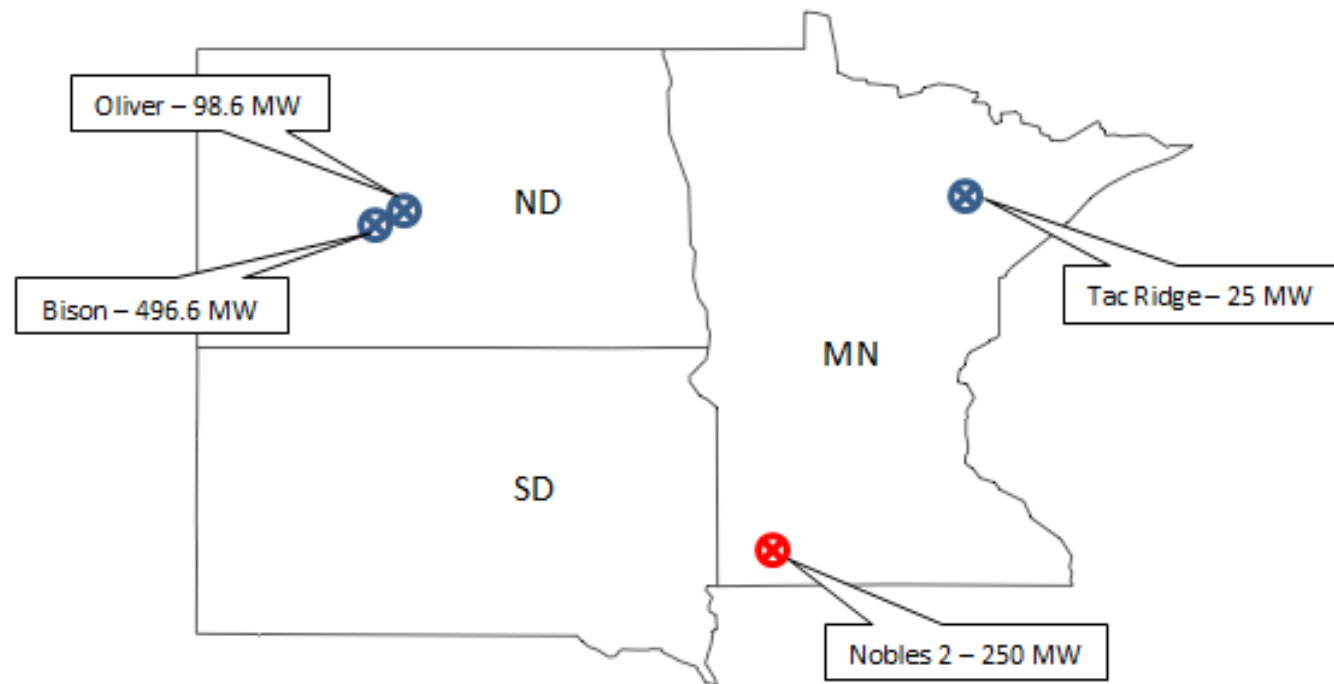
# Addition of Wind, Solar and NTEC Reduces CO2 Emissions and Positions MP for Future State CO2 Goals



**40% Reduction in CO2 by 2030 since 2005**

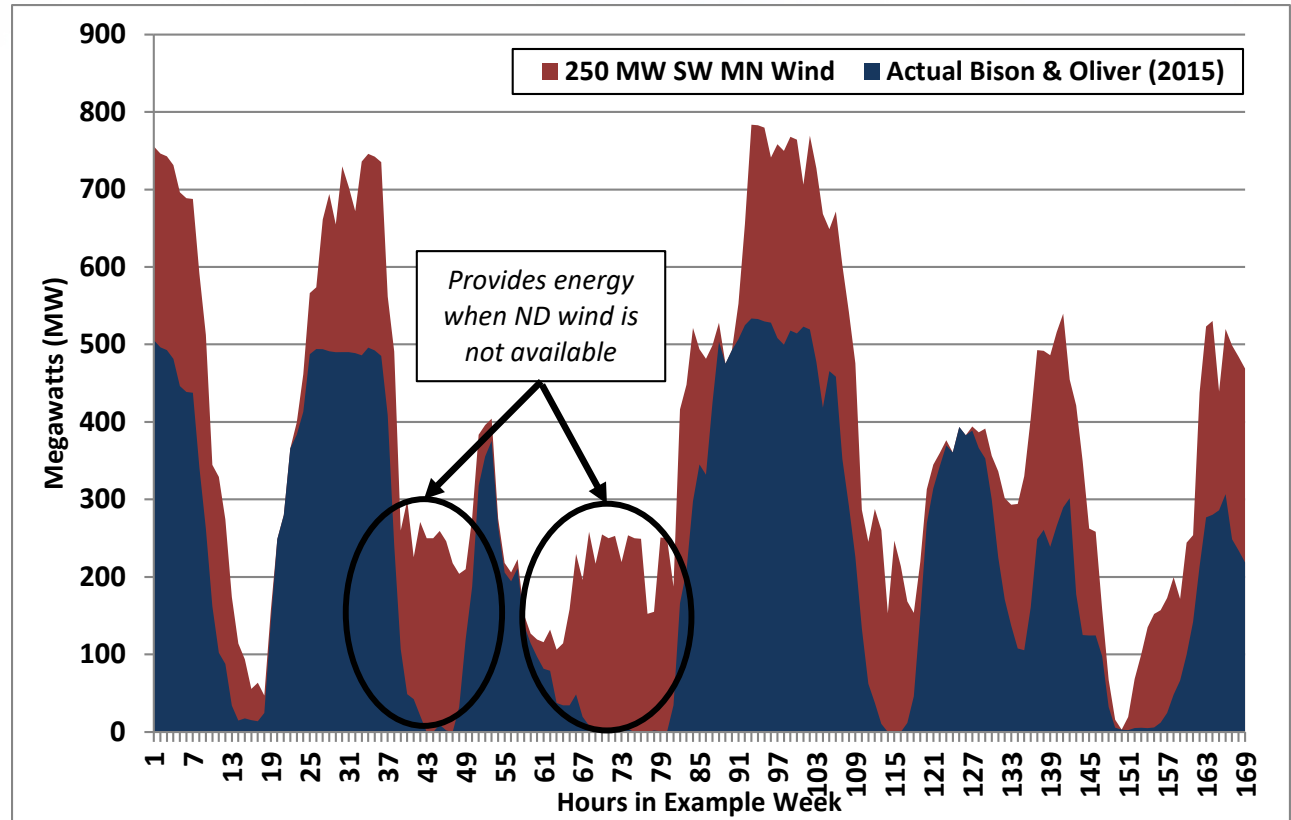
# Diverse Wind: Tenaska Nobles 2

- 250 MW near Wilmont, MN
- Over 1 million MWhs each year of carbon-free energy



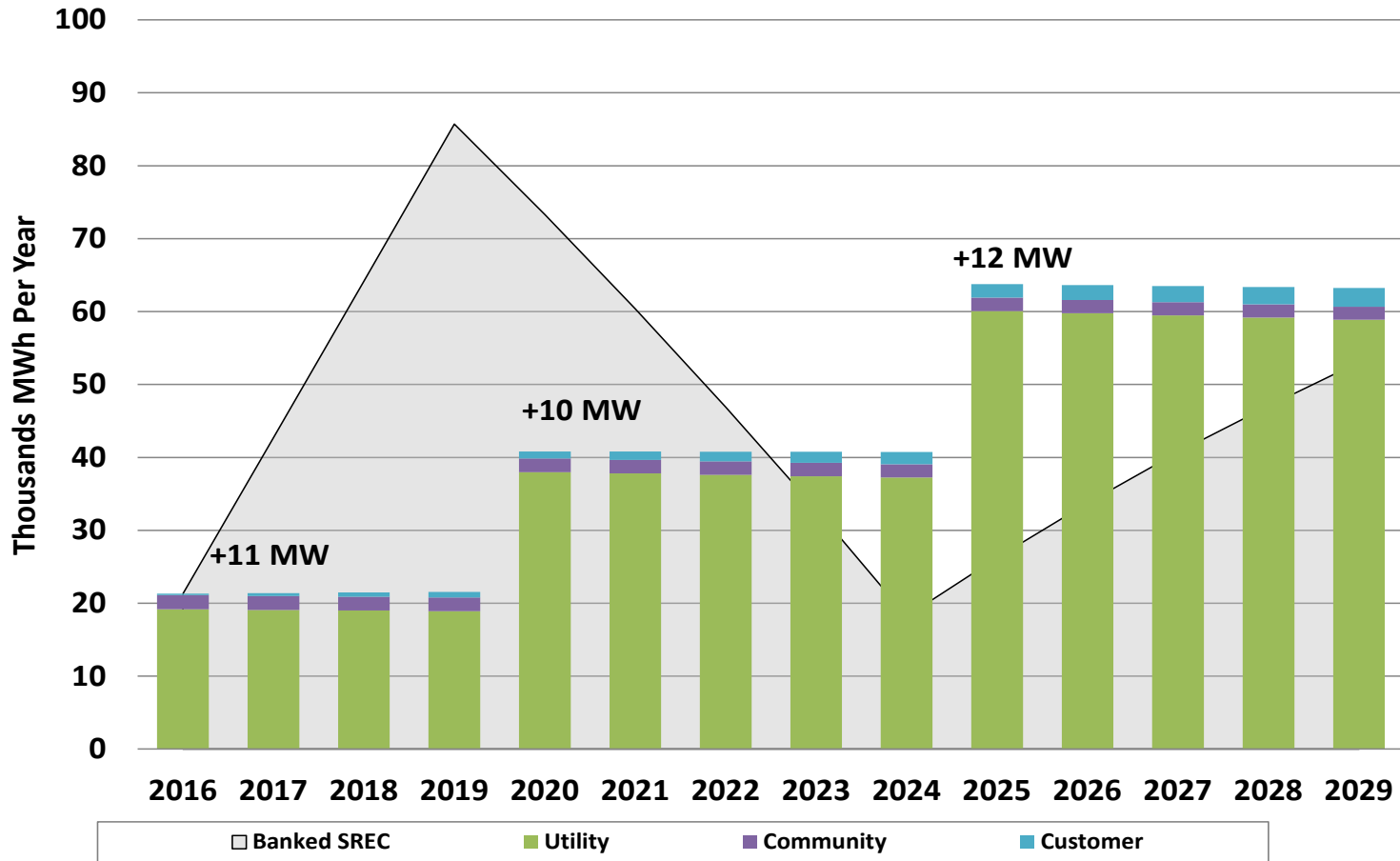
# Diverse Wind: Tenaska Nobles 2

- Diversification of MP's wind resource portfolio
- Decreases variability of total wind production
- Reduces market price exposure



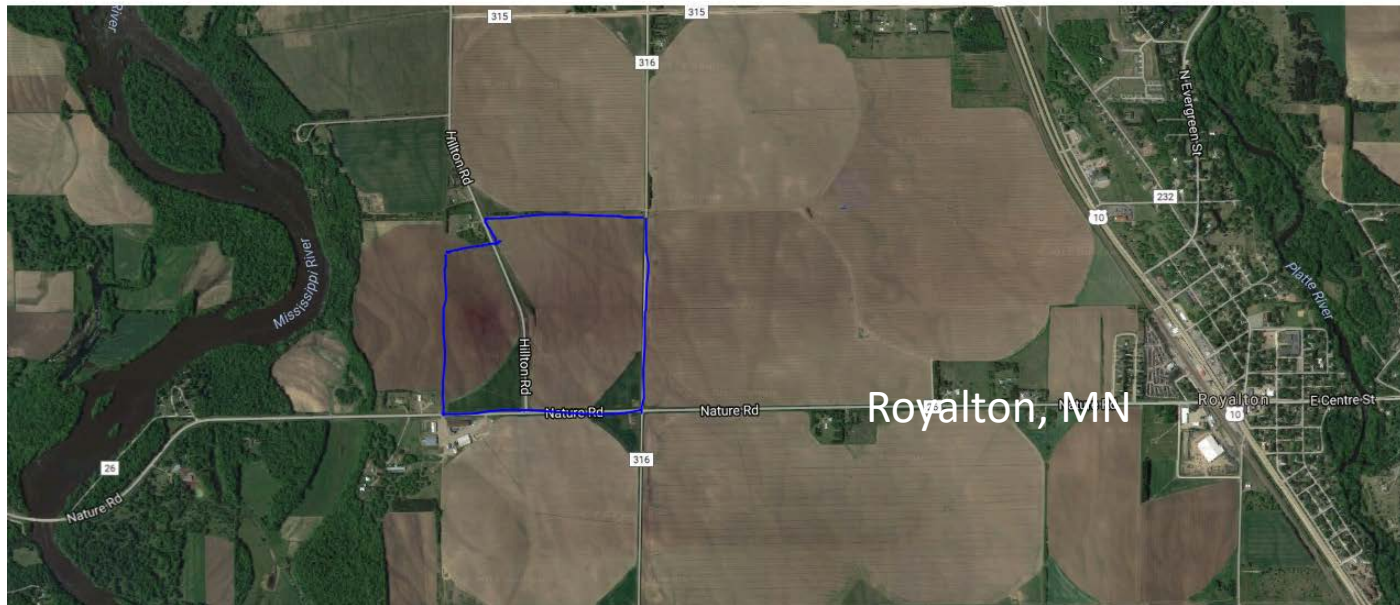
# MP Solar Mandate

Minnesota Power's Solar REC Strategy  
 Projected Solar Development = 33 MW



# Efficient Solar: Cypress Creek Renewables

- 10 MW on MP's Distribution System
- Low interconnection risk



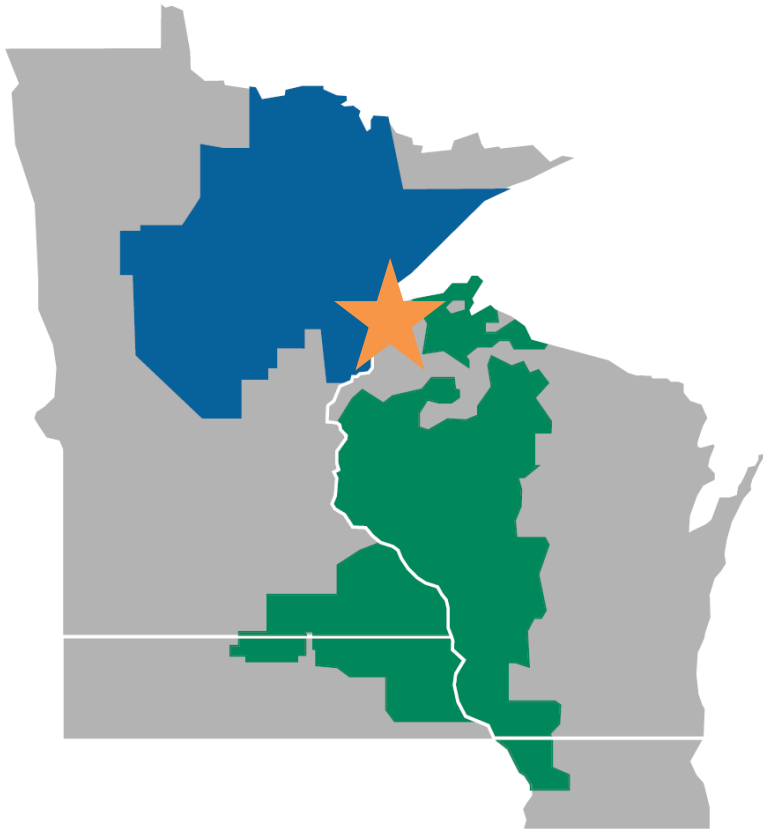
# Flexible Natural Gas – NTEC



# Nemadji Trail Energy Center – a unique collaboration




- Headquartered in Duluth, MN
- 26,000 sq. mi. Service Area
- Serves 16 municipal wholesale customers
- Serves 145,000 retail customers



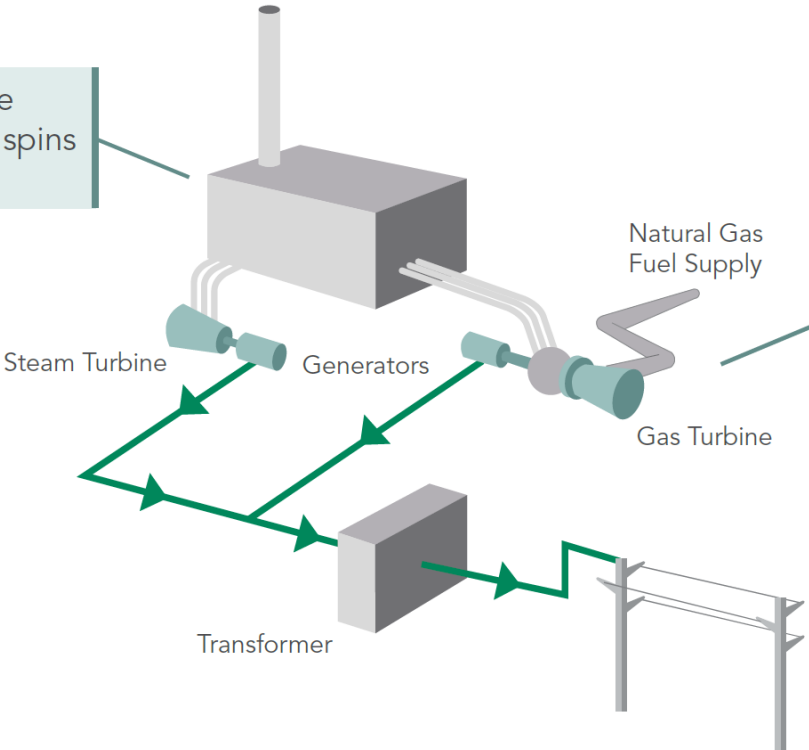
- Headquartered in La Crosse, WI
- 44,500 sq. mi. Service Area spanning 4 states
- Serves 24 member cooperatives and 17 municipalities
- Serves over 600,000 people



# NTEC – Combined Cycle Natural Gas Plant

 The Nemadji Trail Energy Center will generate 525-550 megawatts.  
1 megawatt powers ~1,000 homes.

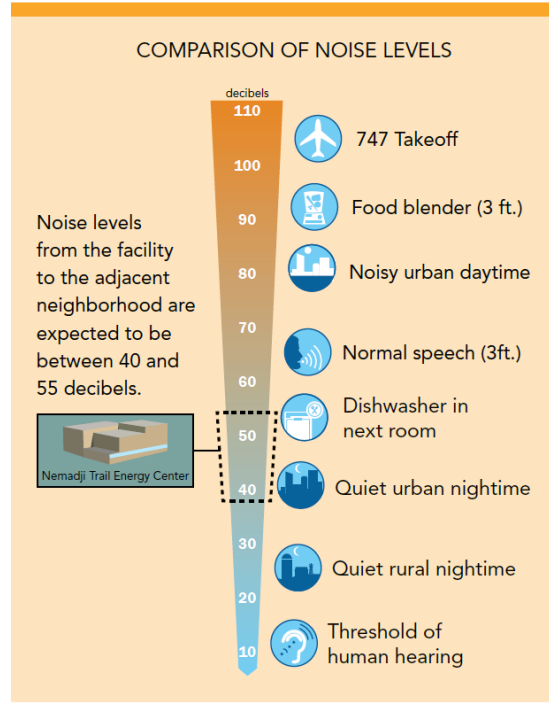
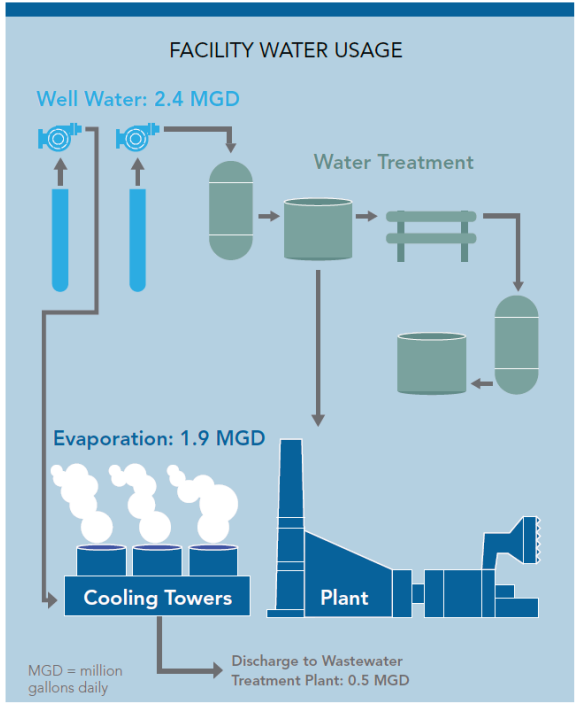
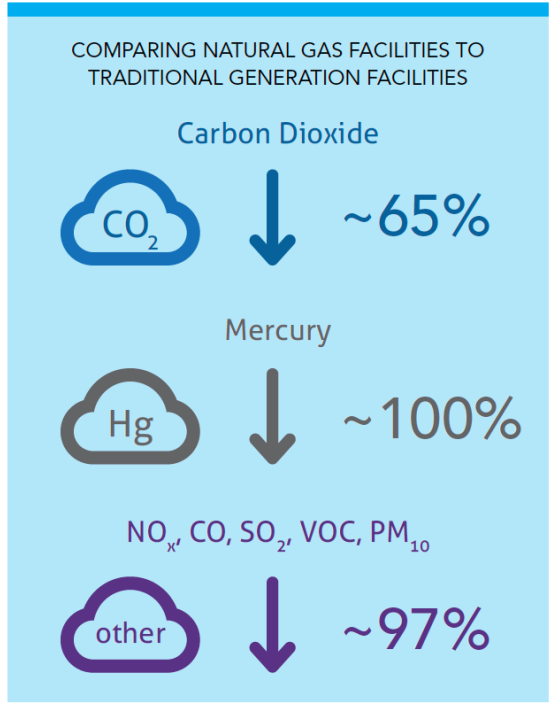
This facility captures waste heat to create steam that spins a second turbine.



Natural gas is burned which produces high-pressure, high-temperature gas that spins a turbine.

Energy from the turbines flows to a transformer and continues through the electrical grid to power homes and businesses.

# NTEC – Environmental Considerations







Questions?