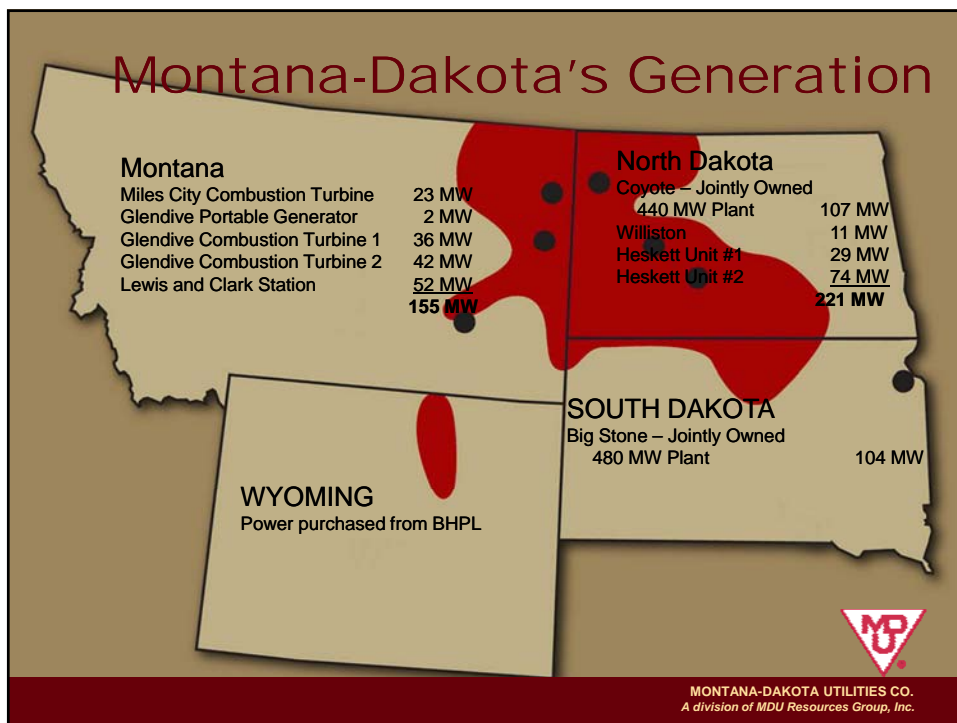


Energy Development and Transmission Committee

Montana-Dakota Utilities Co. Generation Resource Update

December 6, 2007

Alan Welte, Director of Generation



Generation Facilities

- Montana-Dakota's existing generation
 - 75 percent (366 MW) coal fired
 - 25 percent (114 MW) gas/oil fired
- Renewable – 19.5 MW wind
 - Construction in progress
 - Commercial Operation at end of 2007 and early 2008



Generation Facilities

- Mixture of Technologies
 - Cyclone
 - Fluid bed
 - Stoker
 - Tangential/Pulverized coal
 - Combustion turbines – various designs
 - Wind turbines



Fossil Fuel Generation Efficiency

- Efficiently serving customers and market factors drive Montana-Dakota to wring out available efficiencies



Fossil Fuel Generation Efficiency

- Long history of making incremental efficiency improvements
 - Conversion of R.M. Heskett Station Unit #2 to a fluidized bed boiler
 - Installation of Glendive #2 high efficiency GE LM6000 Aeroderivative combustion turbine.
 - Addition of evaporative cooling (fogging) systems on the Miles City and Glendive #1 combustion turbines



Fossil Fuel Generation Efficiency

- Long history of making incremental efficiency improvements
 - Replacement of process control systems
 - Turbine component modifications and retrofits
 - Generator excitation system replacements



Fossil Fuel Generation Efficiency

- Long history of making incremental efficiency improvements
 - Installation of variable frequency motor drives
 - Coal blending
 - Other projects at co-owned facilities as described by Otter Tail Power Co.
 - Ongoing research projects



Fossil Fuel Generation Efficiency

■ Limitations and regulatory issues

- Large efficiency improvements are limited by original equipment design and choice of fuels
- Environmental regulations preclude some efficiency projects or make them uneconomical.



Environmental Upgrades

■ Regional Haze (Best Available Retrofit Technology)

- Heskett #2 not a BART applicable unit, but has committed to switch fluid bed media & equipment to limestone by December of 2012

■ CAMR (Mercury)

- Install continuous Hg emissions monitoring systems on Heskett #2 and Lewis & Clark by January 1, 2009
- Heskett #2 - Comply using allocated allowances / Burning of Tire Derived Fuel (TDF)
- Lewis & Clark – Evaluate & install Hg control technology to meet initial January 1, 2010 compliance



Environmental Upgrades

■ Boiler MACT

- Heskett #1 stack testing indicated low Hazardous Air Pollutant levels and unit not MACT applicable
- EPA rule was vacated
- Awaiting NDDOH confirmation that no further action is needed



Other Projects

■ Repower / Combined Heat & Power Projects

- Continue to look for synergies and evaluate opportunities at existing generation facilities that will maximize efficient use of energy and minimize emissions



Other Projects

■ Transmission

- Exploring areas of expansion within MDU service territory as customer load grows
- Concerned about amount of wind projects in MISO queue process and costs incurred by MDU customers as these interconnect to the system



Renewables

■ Considered in Integrated Resource Plan

- Supply side planning includes:
 - Renewable resources
 - Fuel type, cost, availability
 - Consideration of MISO market
 - Resources to meet economic development
 - Least-cost and best-cost considerations



Renewables

- Possibilities to meet future requirements
 - Expand MDU owned wind generation
 - Install non-traditional renewable generation
 - Power purchase agreement

