

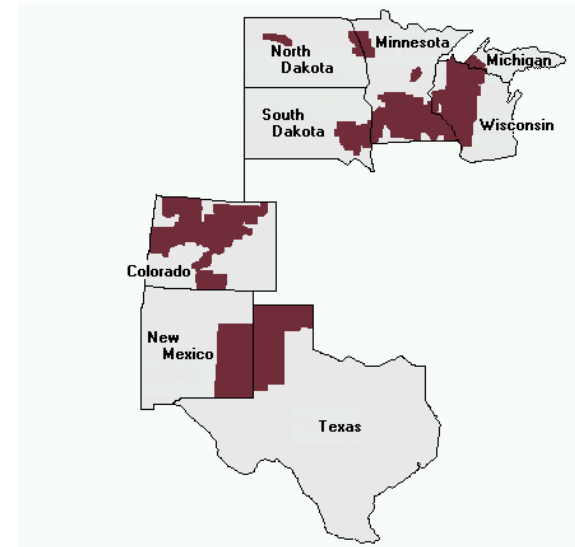
# **Enhanced Efficiency Motors**

**CEE June Meeting  
Industrial Motors & Motor Systems Committee  
Anne Kraft, Xcel Energy  
June 11, 2008**

# Xcel Energy – the stats

- **States Served: 8**

- Colorado, Michigan, Minnesota, New Mexico, North Dakota, South Dakota, Texas and Wisconsin



- **Electric Customers: 3.3 million**
- **Natural Gas Customers: 1.8 million**
- **Employees: 11,987**

# Xcel Energy – the stats

- **Major Generating Facilities**
  - 16 Coal Plants: 7,921 MW
  - 28 Natural Gas Plants: 5,834 MW
  - 2 Nuclear Plants: 1,668 MW
  - 26 Hydro Plants: 511 MW
  - 4 Oil Plants: 16 MW
  - 3 Refuse-derived (RDF) Plants: 67 MW
  - Wind: 25 MW
- **Electric Transmission Lines:** 82,483 miles
- **Distribution Lines:** 190,414 miles
- **Natural Gas Pipeline:** 34,886 miles

# **Business Energy Efficiency Programs**

## **Electricity programs**

- **Cooling Efficiency**
- **Commercial Real Estate Efficiency**
- **Compressed Air Efficiency**
- **Custom Efficiency**
- **Efficiency Proposal**
- **Electric Rate Savings**
- **Energy Analysis**
- **Energy Design Assistance**
- **Efficiency Controls**
- **Lighting Efficiency**
- **Motor Efficiency**
- **Process Efficiency**
- **Recommissioning**
- **Saver's Switch**

# **Business Energy Efficiency Programs**

## **Natural gas programs**

- **Boiler Efficiency**
- **Commercial Real Estate Efficiency**
- **Custom Efficiency**
- **Efficiency Proposal**
- **Energy Analysis**
- **Energy Design Assistance**
- **Efficiency Controls**
- **Natural Gas Rate Savings**
- **Process Efficiency**
- **Recommissioning**

# Motor Efficiency Program

## Minnesota Program

- **Prescriptive Rebates for new motors (new purchase or replacing failed motor) at NEMA Premium efficiencies at \$4/hp**
- **Prescriptive Rebates to replace operating motors with NEMA Premium at \$16.50/hp**
- **Custom Program - \$200/kW saved**
- **ASDs (drives) - \$30/hp when adding a drive to an existing system operating at least 4,000 hours per year (currently filed to reduce this to 3,000 hours per year)**

# Motor Efficiency Program

## Colorado Program

- **Prescriptive Rebates for new motors (new purchase or replacing failed motor) at NEMA Premium efficiencies of \$3-10/hp based on motor size**
- **Custom Program - \$200/kW saved**
- **VFDs (drives) - \$30/hp when adding a drive to an existing system operating at least 4,000 hours per year (will soon change to 3,000 hours per year)**

# **Efficiency Standards Changing – The Effects**

- **2010 (or 2011) NEMA Premium will be the standard.**
- **Existing motor rebate program will decrease in size by 20% (~5 GWh annually) Conservation goals increasing in MN in 2010 to 1.5% of electric sales**

# **New Products in the Market**

- **Cast Copper Rotor Motors**
  - **Articles introducing commercially manufactured product in 2003**
  - **Announcement from Siemens to start offering product (1-20 HP) in the U.S. in 2006.**
  - **Claiming efficiencies 1-2% above NEMA premium at 10% incremental cost**
  - **Some U.S. companies will build custom cast copper rotor motors as well**

## **Develop an “adder” rebate**

- **Generic and not focused on particular technology**
- **Model benefit-to-cost ratios based on efficiency at 1% and a 10% increase in cost over NEMA premium.**
- **Additional \$2/hp saved over existing rebate of \$4/hp and \$16.50/hp**
- **Benefit-to-cost for the customer, utility, and society needs to be >1.0**

# Motor Master+ 4.0

- Search on NEMA Design B
- Product list prices and efficiency levels by manufacturer and hp

