

# LOWER BRULE SIOUX TRIBE

Energy Planning Department

Bill Ziegler Jr.

Director

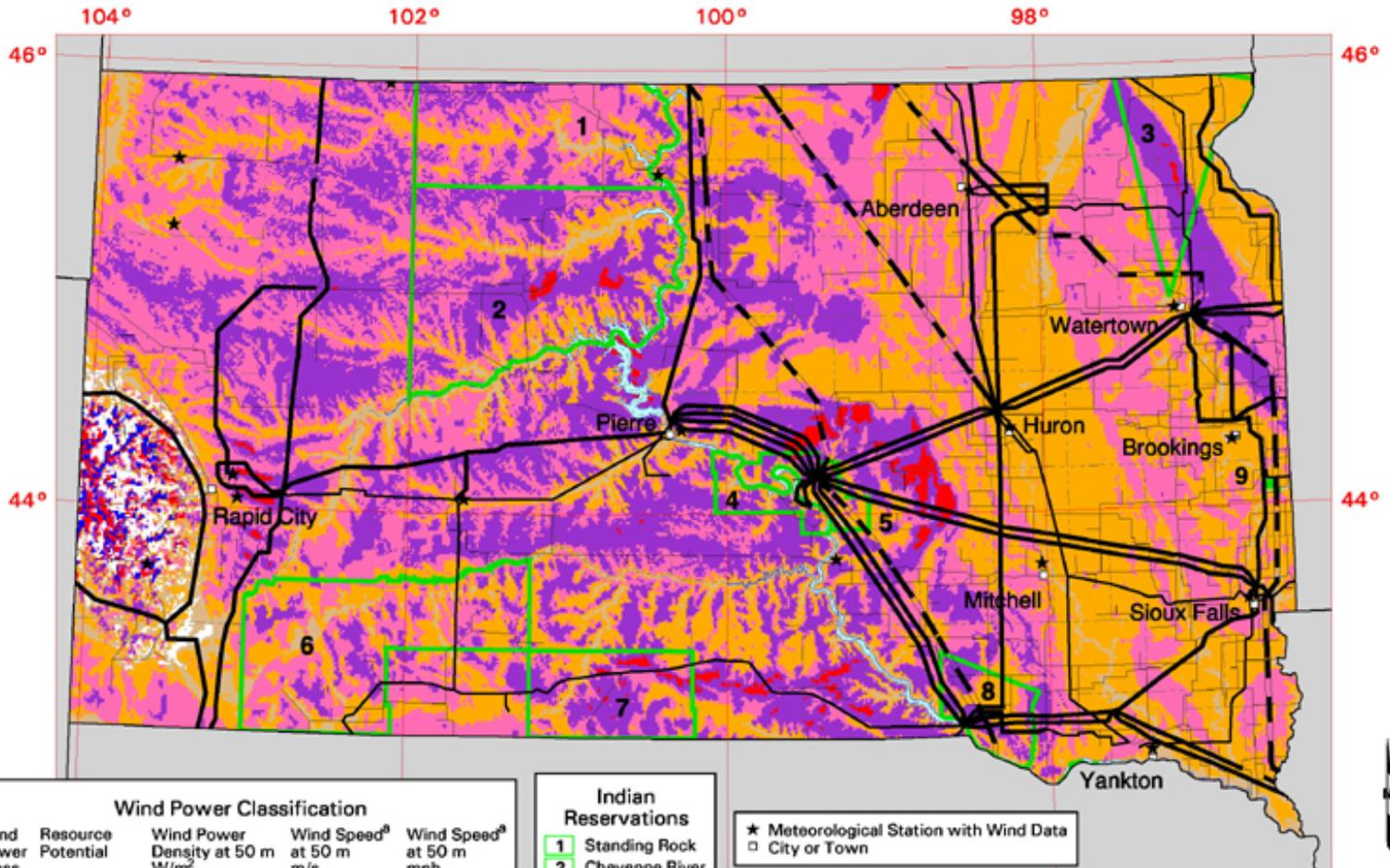
# General Information

---

## # Demographics

- 2,600 Enrolled Members
- 1,200 Resident Members
- 230,000-acre reservation
- High unemployment rate

# South Dakota - Wind Resource Map



Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m <sup>2</sup>	Wind Speed <sup>a</sup> at 50 m m/s	Wind Speed <sup>a</sup> at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

<sup>a</sup> Wind speeds are based on a Weibull k value of 2.0

- Indian Reservations**
- 1 Standing Rock
  - 2 Cheyenne River
  - 3 Lake Traverse
  - 4 Lower Brule
  - 5 Crow Creek
  - 6 Pine Ridge
  - 7 Rosebud
  - 8 Yankton
  - 9 Flandreau

★ Meteorological Station with Wind Data  
 □ City or Town

- Transmission Line Voltage**
- ~ 69 Kilovolts
  - ~ 115 Kilovolts
  - ~ 230 Kilovolts
  - ~ 345 Kilovolts



U.S. Department of Energy  
 National Renewable Energy Laboratory



# Energy Overview

---

## # Energy Demand

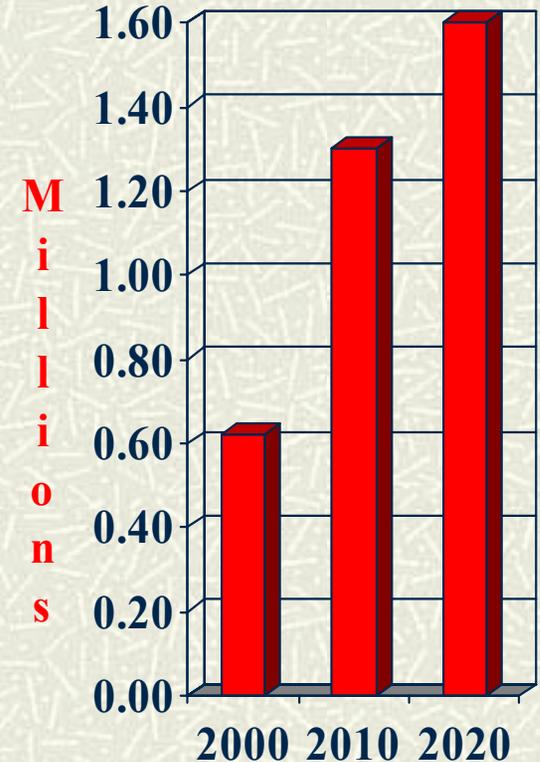
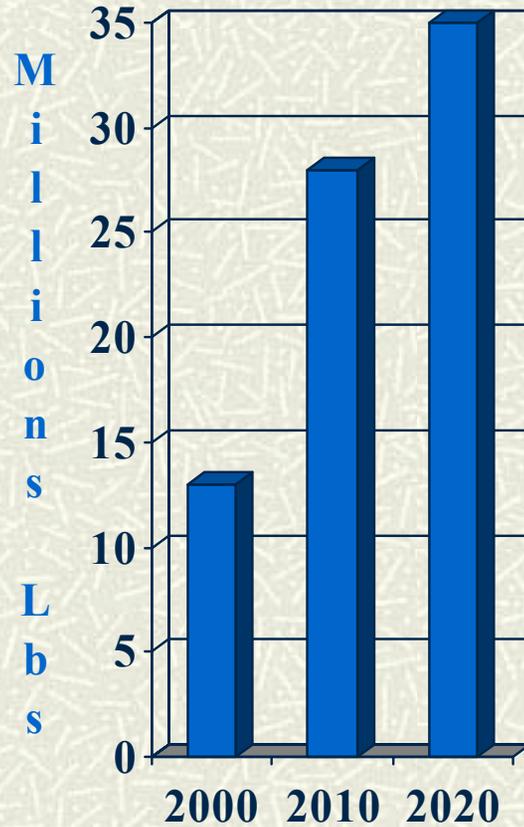
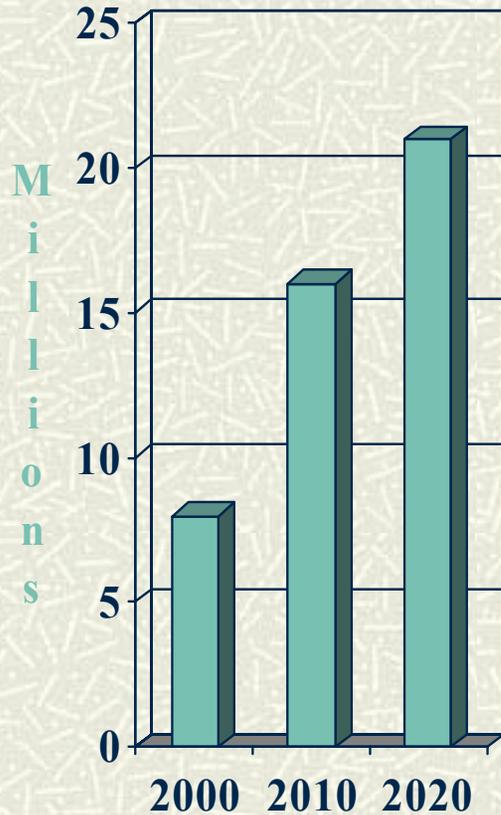
- Residential Electric Consumption 2000
  - 9 cents per kWh
  - \$1,100 per household/year
  - 4 million kWh
  - \$400,000
  - 7 million lbs. CO2 from Electricity
- Commercial Electric Consumption 2000
  - 3 million kWh
  - \$230,000
  - 6 million lbs CO2 from Electricity

# Energy Overview Continued

■ kWh

■ CO2

■ Cost



# Energy Supply

---

## # Tribal Energy Supply

### ■ Wind Data

- Approximately 2 years worth of Data on 2 sites
- 18 Mph at selected site
- North/North West wind direction

### ■ Hydro Capability

- Landscape is favorable for such a development project. Adjacent to river, Natural pond areas
- Title 6 Act; restored lands taken under pick-sloan Act

# Project Description

---

- Test the feasibility of blending Wind power and Hydro power to produce “FIRM” power
    - Hydro would utilize Pump-back water storage reservoir and hydroelectric turbines
    - Location is very conducive to use of both technologies, all relevant basics exist on site:
      - Wind: Class 6
      - Within 1/8 mile of phase 3 transmission lines and interconnection point
      - All land is owned by the LBST, Easily accessible
- Competitive Analysis

# Project Description Continued

---

- Hydro: Landscape is very conducive
- Natural ponds and drainage ditches
- Title 6 Act

# Project Description Continued

---

## # Feasibility Tests

- Verification of Wind Data
- Rights to divert water
- Cost, technical and physical feasibility of constructing a reservoir that is sufficient
- Investigate & evaluate integrated circuitry of technologies: wind, hydro turbines, pumps & discharge turbines

# Project Description Continued

---

- Potential increased marketability of “FIRM” power
- Access of the Grid, interconnection requirements, and transmission
- Economic feasibility
- Political feasibility
- Environmental benefits/impacts & permitting process

# Project Description Continued

---

- Corporate Structure
- Business and Financing Plan
- Operations, Maintenance and Training Planning
- Infrastructure Development Planning

# LOWER BRULE SIOUX TRIBE

The End.....  
Just the beginning