



Ainsworth Wind Energy Facility

**Nebraska Wind Working
Group**

February 18-22, 2008

John Richards



Nebraska Public Power District

"Always there when you need us"



Ainsworth Wind Energy Facility – Background/History

- 2001 NPPD Strategic Plan considered 5 MW of Renewables
- Deliberative polling in 2003 showed strong public support for renewables – even with slight rate increase
- Input from NPPD customers in April 2004 showed support for a 60 MW wind facility
- 2004 NPPD strategic plan revised to include a long-term generation goal of 5% renewable – when it can be shown sufficient value compared to cost



Ainsworth Wind Energy Facility - Business Case

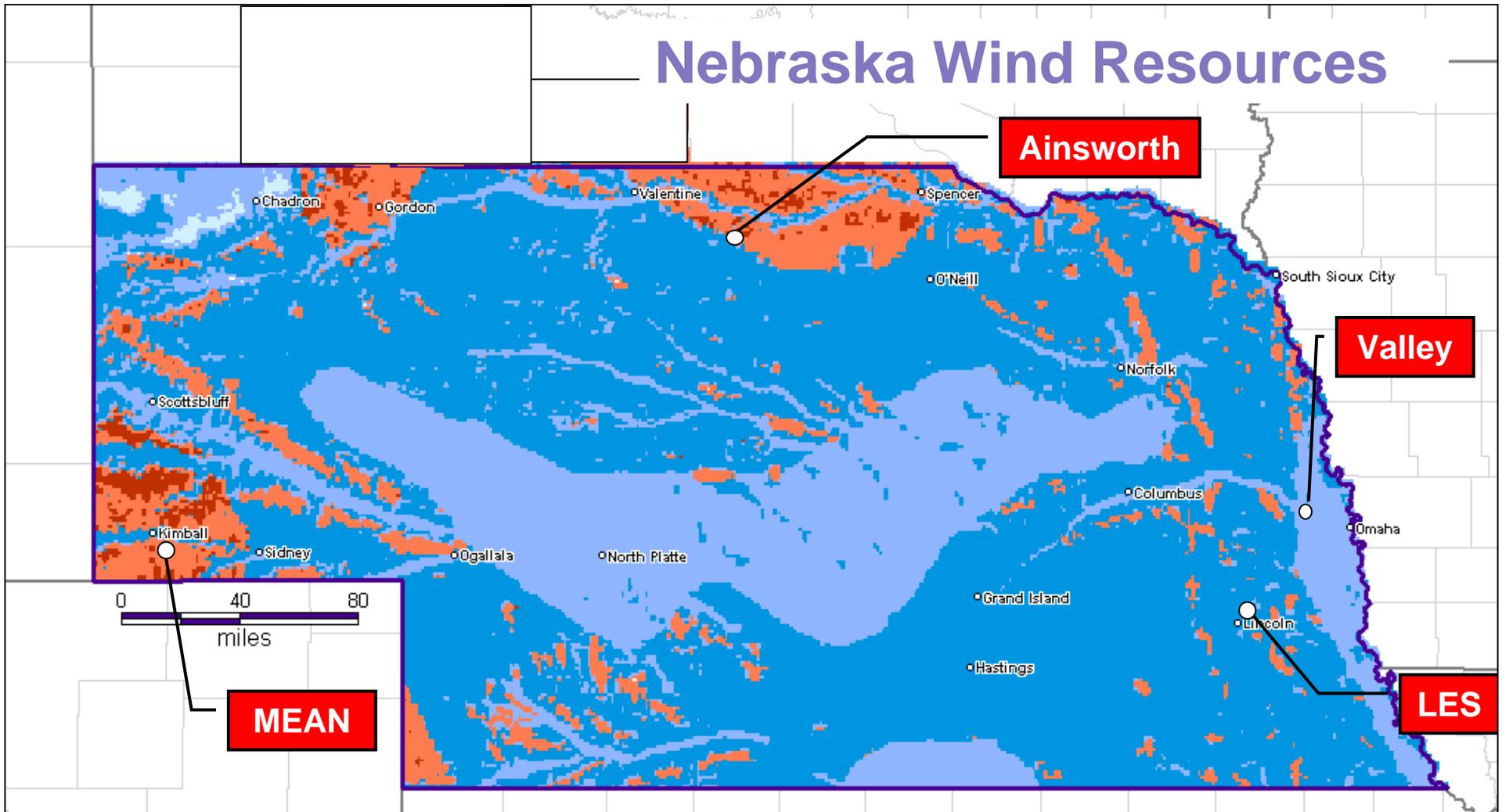
- Based on economics, not the polls
- Did not include the value of renewable energy credits or Renewable Energy Production Incentives
- Recognizes value of wind energy to reduce power purchased and/or increase external power sales
- With partners, without incentives, rate increase is less than 0.28% (\$0.28/month for a \$100.00/month electric bill)



So, Why Ainsworth? – Key Factors

- Verified Wind Speeds
- Transmission Line Access

Nebraska Wind Resources



Nebraska Wind Installations

Wind Classifications @ 50 meters

	Class 1	< 5.6 m/s	< 12.5 mph
	Class 2	5.6 – 6.4 m/s	12.5 – 14.3 mph
	Class 3	6.4 – 7.0 m/s	14.3 – 15.7 mph
	Class 4	7.0 – 7.5 m/s	15.7 – 16.8 mph
	Class 5	7.5 – 8.0 m/s	16.8 – 17.9 mph
	Class 6	8.0 – 8.8 m/s	17.9 – 19.7 mph



Key Factors for Ainsworth Site

- Large site – can optimize wind turbine placement
- Close to existing transmission that can support the wind facility with minimal added costs
- This was the best site of the more than 8 sites monitored
- Minimal disruption to existing land use



Key Factors for Ainsworth Site

- Positive support from local community
- Previous and positive experience working with KBR Rural Public Power District, an NPPD Wholesale Public Power Utility
- No significant environmental impacts
 - Bird monitoring
 - Beetle strategy



American
Burying
Beetle





Ainsworth Wind Energy Facility Participants

- **60 MW Total**

- NPPD – 32 MW
- Jacksonville Electric Authority – 10 MW
- Omaha Public Power District – 10 MW
- Municipal Energy Agency of Nebraska – 7 MW
- City of Grand Island – 1 MW

Site and Facility

■ Facility design:

- 36 Vestas turbines
- 1.65-megawatt turbines
- 269 foot (82m) rotor diameter
- Tubular steel towers
- Turbines stand 230 feet (70m) above ground
- Wiring to substation is underground
- Includes a remote monitoring system

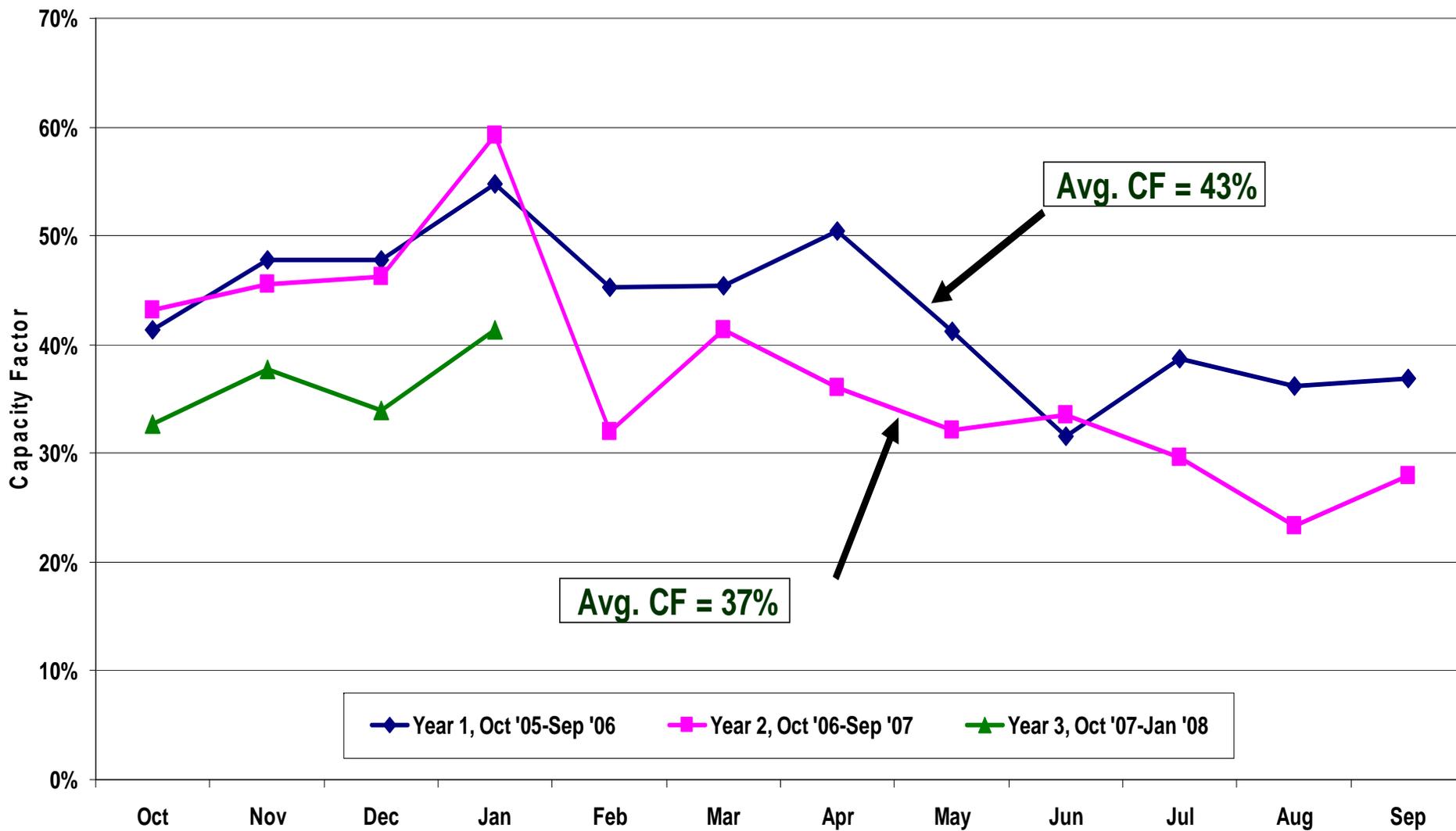


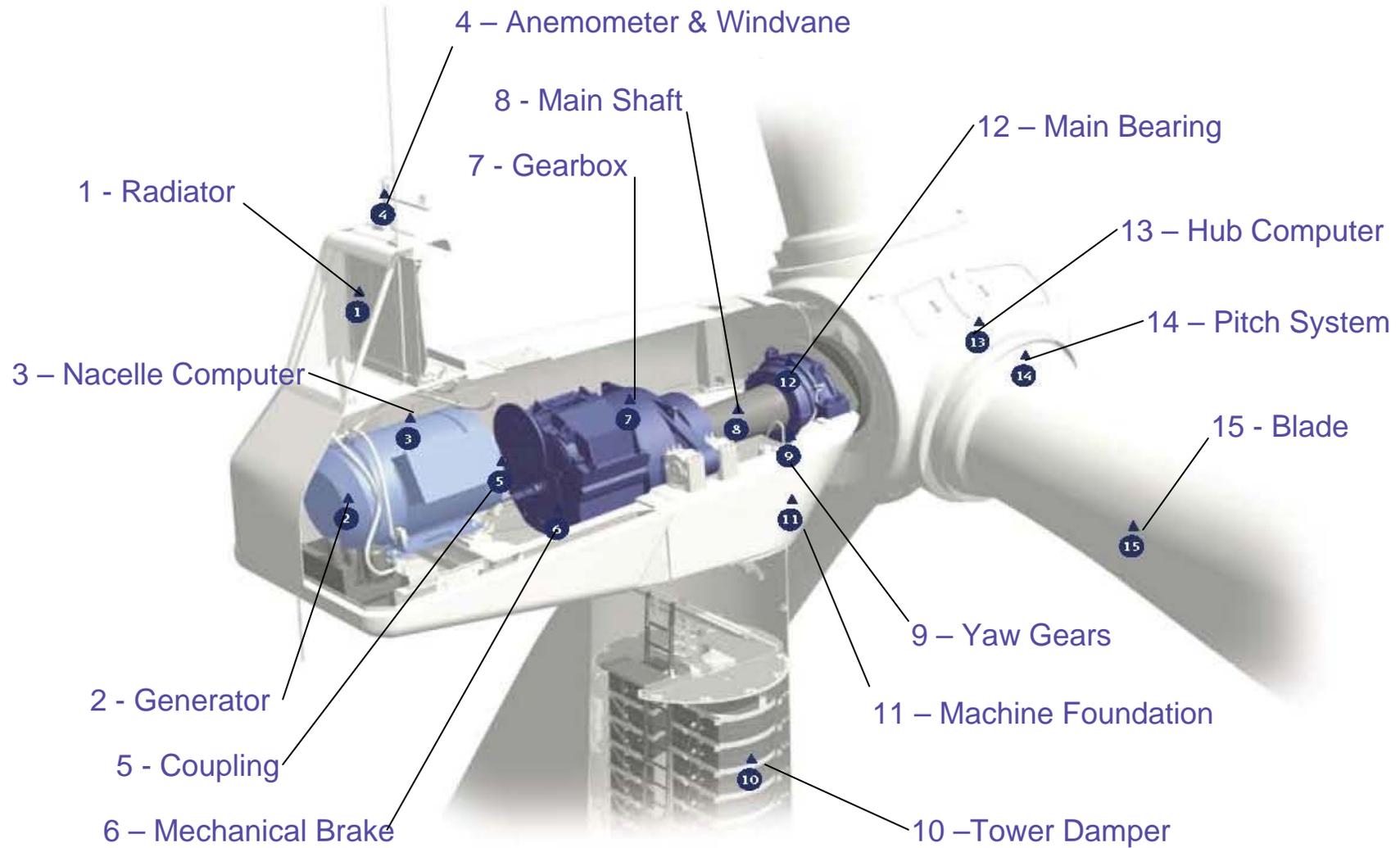


Ainsworth Wind Energy Facility - Facts

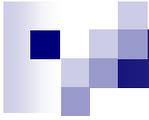
- Annual Generation to supply 19,000 homes
- Total Cost \$81.3 million

Ainsworth Monthly Capacity Factor





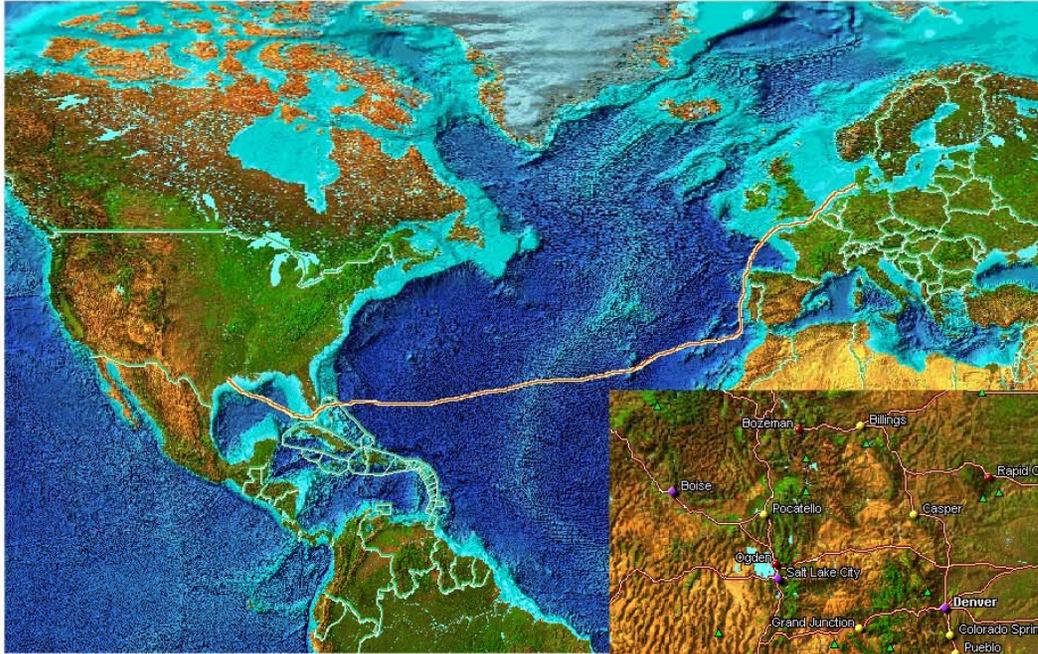
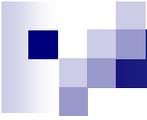
Turbine Components



Substation

Turbine Foundations





General Information

Turbine Specifications:

Nacelle: 40'x11'x12', 85 Tons
Hub: 14'x14'x8', 25 Tons
Blades: Approx. 130' long, 3.5 Tons each

Tower Specifications:

Three Sections Per Tower
Each approx 90' in length
Approx. 35 Tons each

Turbine and Tower Route

Denmark to Nebraska



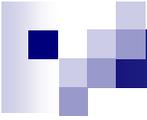
Prepared by Thomas Bode

Blade Assembly

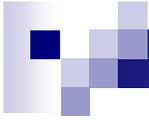




Inside a Blade



Looking up a Tower Section



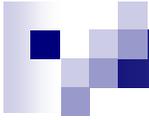
Blade Lift



Inside a Turbine Nacelle



On top a Turbine Nacelle



Aerial View

Questions?

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