

Towers and power.

The facts behind Bison I Wind Energy Center.

It takes more than wind to turn the 332-foot rotors on a wind turbine. It takes landowners, planning and delivery to give the promise of clean, renewable energy. That's what we'll give you, and here's what it will take.

- Thirty-three 2.3 MW turbines
- Annual output of approximately 300,000 megawatt hours of energy
- Enough energy to power 33,000 homes each year
- Estimated \$180 million project will be constructed in two phases:
 - 16 completed by December 2010
 - 17 additional turbines completed by November 2011

Wind Turbine: Siemens SWT, 2.3 MW, 101

Rotor diameter: 332 feet

Blade length: 161 feet

Hub height: 262 feet

Total height with blade extended straight up: 428 feet

Tip speed: 70-190 mph

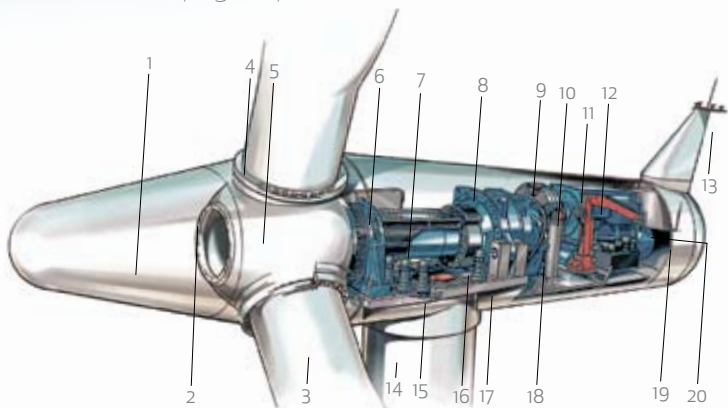
Cut in wind speed: 9 mph

Cut out wind speed: 56 mph



A WIND ENERGY INITIATIVE OF MINNESOTA POWER IN NORTH DAKOTA

Siemens SWT, 2.3 MW, 101



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|-------------------|---------------------------|---------------------|
| 1 Spinner | 8 Gearbox | 14 Tower |
| 2 Spinner bracket | 9 Brake disc | 15 Yaw ring |
| 3 Blade | 10 Coupling | 16 Yaw gear |
| 4 Pitch bearing | 11 Generator | 17 Nacelle bedplate |
| 5 Rotor hub | 12 Service crane | 18 Oil filter |
| 6 Main bearing | 13 Meteorological sensors | 19 Canopy |
| 7 Main shaft | | 20 Generator fan |

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