

*PSE: Leader in clean, renewable energy*

Puget Sound Energy is a national leader in wind power, and is recognized by the American Wind Energy Association as the second-largest utility owner of wind energy facilities in the United States. PSE owns the Hopkins Ridge Wind Facility, which entered commercial production in 2005, and the Wild Horse Wind and Solar Facility, which entered production in 2006.

## Hopkins Ridge



*PSE Hopkins Ridge Wind Facility*

- Location – 15 miles northeast of Dayton, Columbia County; 285 miles southeast of Seattle
- Land area – 11,000 acres of leased land; mostly wheat fields
- Start-up – November 2005
- Turbines – 87
- Power output – 157 megawatts (MW) at peak capacity; 456,000 megawatt-hours (MWh) annual output (est.), enough to meet the total power needs of about 40,000 households

## Wild Horse

- Location – 16 miles east of Ellensburg, Kittitas County; 127 miles southeast of Seattle
- Land area – 9,000 acres, two-thirds owned by PSE, remainder leased from the state of Washington; mostly undeveloped shrub-steppe
- Start-up – December 2006
- Turbines – 127
- Power output – 229 MW at peak capacity; 642,000 MWh annual output (est.), enough to meet the total power needs of about 60,000 households
- Renewable Energy Center visitor's facility

## Common structural features

- Turbines – 351 feet tall from the ground to the tip of a vertical rotor blade; 223 tons total weight
- Towers – 221 feet tall at the rotor's hub, 13.2 feet wide at the base, 7.6 feet wide at the top
- Tower foundation – buried 25 to 32 feet (depending on bedrock depth) in up to 260 cubic yards of concrete; 120 anchor bolts extend from ground level to the bottom of the 14-foot-diameter foundation (a single 28-foot-long anchor bolt weighs 150 pounds)
- Rotor / blades – each of the rotor's three blades is 129 feet long, 11.6 feet wide near the hub, and 1.6 feet wide at the tip; the blades, made of composite materials, weigh more than 7 tons each
- Generators – manufactured by Denmark-based Vestas, each V80-model generator produces up to 1.8 MW of power; housed inside a fiberglass "nacelle," the generators produce power at 690 volts, which is stepped up by a transformer inside the nacelle to 34.5 kilovolts; a power-collection system connects strings of turbines to the substation, where power is stepped up again to transmission voltage
- Rotor / wind speed – the rotor spins clockwise at 16.5 revolutions per minute; the turbines generate electricity at wind speeds as low as 9 mph, reach peak generation at 31 mph, and shut down at constant wind speeds of 56 mph