

# TWIN BUTTES

## Wind Power Project



### Project Overview

The Twin Buttes Wind Power Project is a 75 megawatt (MW) wind energy project located in Bent County near Lamar, Colorado. Twin Buttes is located about eight miles west of Avangrid Renewables' Colorado Green Wind Power Project in Prowers County. Typically, a 75 MW wind farm can provide clean, renewable electricity to more than 22,000 homes, according to the American Wind Energy Association's calculation.



The project supports the local economy through lease payments to local landowners and property tax payments to Bent County. While the entire project spans approximately 9,000 acres, the actual footprint of the project is less than 2 percent of the total acreage. Landowners will continue to use the remainder of the land for ranching, grazing and traditional activities. The entire capacity of the Twin Buttes Wind Power Project has been contracted to Xcel Energy.

### Project Details

**Project Capacity:** 75 MW

**Number of Wind Turbines:** 50 GE Energy 1.5 MW turbines

**Project Location:** Bent County, near Lamar, Colorado

### Developer and Owner

Avangrid Renewables, LLC is a subsidiary of AVANGRID, Inc. (NYSE: AGR) and part of the IBERDROLA Group. IBERDROLA, S.A., an energy pioneer with the largest renewable asset base of any company in the world, owns 81.5% of the outstanding shares of AVANGRID common stock. Avangrid Renewables, LLC is headquartered in Portland, Ore., and has more than \$10 billion of operating assets totaling more than 6,000 MW of owned and controlled wind and solar generation in 22 U.S. states. Avangrid Renewables recently changed its legal name from Iberdrola Renewables, LLC.

### Customer: Xcel Energy

The entire capacity of the Twin Buttes Wind Power Project has been contracted to Xcel Energy subsidiary Public Service Company Colorado for a period of 20 years. Public Service Company Colorado is one of the country's leading wind power providers. Xcel Energy offers a comprehensive portfolio of energy-related products and services to 3.3 million electricity customers through operations in eight Western and Midwestern states.

Learn more at [www.avangridren.com](http://www.avangridren.com)



## Technology

The GE Energy 1.5 MW turbine is a variable speed, constant frequency design with aerodynamically designed airfoils on a 77-meter rotor.

**Turbine Height:** 389 ft. (118.5 meters) from the bottom of the tower to the tip of the highest blade or about as high as a 30-story building.

**Turbine Weight:** Approximately 235 tons (470,600 lbs.)

**Tower:** Three-section tubular steel

**Height:** 263 feet (80 meters)

**Foundation:** Each wind turbine foundation consists of a concrete octagonal spread footing 48 feet in diameter, with a tower pier 18 feet in diameter, and a total depth of 7.5 feet.

**Footprint:** Turbines are spaced from 500 – 3,000 ft. apart. Rows of turbines are spaced between three quarters to more than one mile apart.

**Concrete:** 270 cubic yards per turbine (27 truckloads)



## Wind Energy

- The U.S. wind industry in 2015 was the leading source of new electric generating capacity.
- With recent industry growth, wind energy is on track to meet the Department of Energy's Wind Vision scenario of supplying 20 percent of U.S. electricity by 2030.
- Wind energy manufacturing now supports jobs across 43 states, and wind turbine technicians are the fastest growing profession in the U.S., according to the Bureau of Labor Statistics.
- Across the U.S., wind has attracted \$128 billion in new wind project investment over the last 10 years.
- Wind developers pay a growing total of \$222 million a year in land lease payments to U.S. farmers, ranchers and other rural landowners.
- Each new wind turbine typically avoids over 4,200 metric tons of carbon dioxide (CO<sub>2</sub>) a year, (equal to nearly 900 cars' worth). U.S. wind energy avoided 132 million metric tons in total CO<sub>2</sub> emissions in 2015. As a result Americans can breathe easier due to pollution-free, renewable wind energy displacing harmful emissions from other energy sources.

## Plant Infrastructure

**Turbine Access:** 151,400 linear ft. (28.7 miles) of gravel surfaced roads

**Transmission Interconnection:** 44 miles away at an Xcel Energy substation in Lamar

**Collector Substation:** 34.5kV–230kV substation with a single power trans-

former and high-voltage circuit breakers on the high side and a metal-clad switchgear enclosing multiple 38kV circuit breakers on the low side

**Collection System:** Combination of underground and overhead 34.5kV infrastructure connecting the wind turbines to the collector substation

## Engineering and Construction

**Engineers:** Stantec, TriAxis Engineering Inc.

**Constructors:** Electrical (Rosendin Electric and Michels Corporation), civil/structural (DH Blattner & Sons), O&M building (SM Andersen and High Plains Builders)

**Project Site Workforce:** At peak times, about 100 workers were on site.

