TWIN BUTTES Wind Power Project

IBERDROLA RENEWABLES

Project Overview

The Twin Buttes Wind Power Project is a 75 megawatt (MW) wind energy project located in Bent County near Lamar, Colo. Twin Buttes is located about eight miles west of Iberdrola 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. An average of 40 to 50 jobs were created during construction with a peak work force exceeding 100. The project has created five to six permanent jobs based in the community. While the entire project spans approximately 9,000 acres, the actual footprint of the project is less than 2 percent of the total acreage. Land-owners 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: Iberdrola Renewables

With over 10,000 MW of renewable energy in operation globally, and more than 3,000 MW of that wind power located in the U.S., Iberdrola Renovables is the world's leading provider of wind power. The company is a proven economic engine, directly and indirectly creating 15,000 jobs worldwide in 2008. Iberdrola Renewables Inc. is an American company, incorporated in the U.S. and headquartered in Portland, Oregon, with offices and wind farms in 20 states. Iberdrola Renewables employs more than 800 people in the U.S. and spent more than $2 billion on wind projects in 2008 alone. Iberdrola Renewables recently announced that it intends to invest an additional $6 billion in renewable energy facilities in the United States over the next four years.

Learn more at www.iberdrolarenewables.us

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.

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)

Plant Infrastructure

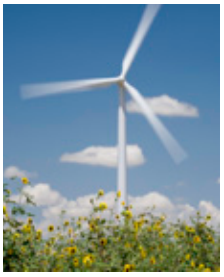
Turbine Access: 151,400 linear ft. (28.7 miles) of gravel surfaced roads
Transmission Interconnection: 44 miles away at an Xcel Energy substation in Lamar
Collector Substation: 34.5kV–230kV substation with a single power transformer and high-voltage circuit breakers on the high side and a metal-clad 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.

Wind Energy

As of September 2009, U.S. wind capacity reached more than 29,000 megawatts (MW), achieving in a few years what had previously taken two decades – the installation of more than 10,000 MW of wind power capacity in the United States. This 29,440 MW of wind energy provides enough energy to serve close to 8.5 million American homes with a clean, inexhaustible, homegrown source of energy. A U.S. Department of Energy study released in 2008 found that wind could provide 20 percent of U.S. electricity by 2030. At that level, wind power would support 500,000 jobs and reduce greenhouse gas emissions as much as taking 140 million vehicles off the road. Today, Denmark, Spain and Portugal meet between 12 to 20 percent of their electricity needs from wind energy. By contrast, wind power supplies about two percent of America's current electricity needs. America's wind resource is vast and could contribute toward a cleaner and more sustainable energy mix.



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