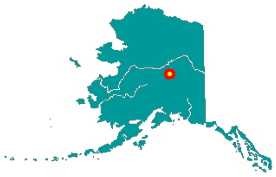
Eva Creek Wind Turbines

Ferry, Alaska



Eva Creek achieves 20 percent renewable energy

Project Overview

In partnership with the Alaska Energy Authority (AEA), Golden Valley Electric Association (GVEA) completed the design and construction of a 24.6 Megawatt wind farm on Eva Creek near Ferry, Alaska. Twelve Senvion turbines were installed and improvements were made on a 17 mile road to the project. The turbines have allowed GVEA to increase its renewable energy production from 8 percent to 20 percent.

Objectives

The main objective of this project was to give GVEA members a renewable, reliable, and cost effective source of energy. GVEA is committed to providing 20 percent of their power with renewable sources. Because of this project, GVEA has reduced their carbon footprint and displaced large quantities of expensive diesel fuel.

Economic Feasibility

The project became operational in October of 2012. Between October of 2012 and December of 2014, the turbines generated 156,480 megawatt-hours of electricity and displaced 11,020,000 gallons of diesel fuel. This displacement saved GVEA communities $28,349,000 in reduced fuel costs. Over its 20-year projected lifespan, the project has a calculated benefit/cost ratio of 2.68.

Project Specifications

Twelve Senvion MM92 turbines, each operating at 2.05 megawatts, were commissioned adjacent to the Eva Creek Mine near Ferry, Alaska. They have a maximum rated capacity of 24.6 megawatts, which is enough energy to power some 9,100 homes in the Interior. Due to the harsh climate experienced by much of Alaska, an anti-freeze solution is injected into the conduit from the transformers to prevent cable dam-

Quick Facts

Total Project Costs: $94 million

Funding: Renewable Energy Fund, State, & Local

Capital Costs

Design: $1,314,855
Construction: $92,685,145

Equipment Specifications

Make/Model: (12) Senvion MM92
Rated Capacity: 2.05 MW
Net Capacity Factor: 32.6%
Rotor Diameter: 92.5 meters
Hub Height: 685 meters
Total Rated Capacity: 24.6 MW

Diesel Equivalent Offset

Estimated Annual: 4,226,501 gallons
Actual Annual: 5,054,000 gallons
Oct. 2012-Dec. 2014: 11,020,000 gallons

Fuel Savings

Estimated Annual: $11,647,550
Actual Annual: $13,074,000
Oct. 2012-Dec. 2014: $28,349,000

Benefit/Cost Ratio: 2.68

Senvion MM92 wind turbines, photo courtesy of AEA.

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age during freeze-up. Road improvements were also made as part of the project to make turbine commissioning easier in the somewhat difficult location.

Allocation of Funding

AEA's Renewable Energy Fund (REF) granted $3,463,200 for feasibility, design, and construction of the project. A state legislative grant contributed $10,000,000 toward design and construction. Local matching funds contributed $82,536,800 that came from 20-year bonds and loans.

Learning Experiences/Challenges

GVEA raised rates slightly in the beginning stages of operation to help pay off the $23,731,051 loan investment. Since then, residential rates have hovered around $0.18/kWh, which is a very reasonable rate.

An issue GVEA has faced is the variability of wind power generation. Wind is not always available when demand is highest, although winds are generally stronger in winter when there is a greater need for heat and electricity. In order to maintain a stable supply of power, GVEA runs a diesel-generated plant that responds accurately and efficiently according to demand. This keeps output at the desired level and fills in gaps if the wind tapers off. An additional challenge has been the maintenance of the 17-mile access road due to its high elevation and terrain.

Community Benefits

GVEA is now able to sell wind-generated electricity to its members for 8 to 9 cents per kilowatt-hour. This price is equal to the cost of energy that Anchorage consumers pay, or 50 percent less than the cost of GVEA's oil-fired energy.

The project has also seen the introduction of four local full-time jobs. The GVEA position looks after the site (roads, buildings, and equipment) while the Senvion crew works on turbines. This project will continue to develop a skilled workforce to operate and maintain wind generation systems.

Eva Creek was the first major Arctic wind generation project in America. With their infrastructure investment and lessons learned, GVEA has contributed to understanding the challenges that come with constructing a large-scale project in northern climates. Any future installation should be easier as a result. The Eva Creek site is also able to accommodate expansion, should the demand for wind power increase within the Railbelt region.

Senvion MM92 turbine, photo courtesy of AEA.

Workers laying turbine foundation, photo courtesy of Akbizmag.com

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