PROJECT SPOTLIGHT

BAD RIVER BAND OF THE LAKE SUPERIOR TRIBE OF CHIPPEWA INDIANS-ODANAH, WI

OVERVIEW

In October 2016, the Bad River Band of the Lake Superior Tribe of Chippewa Indians was without power for days following a flood which washed out bridges and roads on the reservation. Located on the south shore of Lake Superior in northern Wisconsin, the tribe was served by a single line of electricity from the power grid; in essence, a single point of failure.

Though renewable energy was something the tribe had been discussing for some time, this disaster further spurred them to look for ways to prevent future loss of electrical power. Key needs they developed were, first and foremost, resiliency – the discontinuation of a single source of power. Second, they strove for sustainability and a move to more renewable energy resources. Finally, the tribe wanted to save money and take control of their utility spending.

With this information in mind, the Bad River tribe applied for and received a Department of Energy (DOE) grant to help pay for critical power infrastructure for the 156,000-acre reservation. Working with a consulting firm, the tribe developed a Request for Proposal outlining their requirements. EnTech Solutions was chosen from more than a dozen finalists, including regional, national and international energy specialists, based on the following:

- Thoroughness of our proposed solution
- Use of innovative technology that would provide clear value
- Trust as a true energy partner

EnTech Solutions used their energy analysis tool to model energy use and deliver a system to optimize resiliency, sustainability and the delivered price of electricity objectives.

Work began in June 2020 with completion of Phase 1 in March 2021, consisting of three microgrid sites to supply renewable solar energy and energy storage to the tribe's Administrative building, Wastewater Treatment Plant and Health & Wellness Center.

CHALLENGES

One of the first things that may come to mind when you consider a project undertaken in 2020 is the global COVID-19 pandemic. The United States indigenous population was particularly vulnerable, and the Bad River tribe developed critical safety protocols for the reservation. EnTech Solutions also developed specific COVID-related safety measures and worked closely with the tribe to ensure every preventive, testing and quarantining step was strictly followed. These measures led to some minor delays to ensure the safety of the tribal population and of the EnTech project team.

Harsh winter weather in this northern part of the country required that the solar field installation and other weather-sensitive work be completed on a timely basis before the average of 60 inches of snow would fall. Bitter cold weather also affected the project; in addition to the safety of the team members working in brutal cold conditions, accommodations had to be made regarding the powering of the DCentrIQ units to prevent damage to batteries.

SOLUTION

While consideration was given to the proposed solution created by the original consulting firm, EnTech Solutions leveraged its sister companies, Faith Technologies and Excellerate, to design, develop and manufacture a comprehensive energy solution to address the Bad River Tribe's immediate energy needs and with an eye toward the future.

An EnTech Solutions' Xcape™ microgrid was deployed for the administrative building, and DCentrIQ microgrids were implemented for the health and wellness center and the wastewater treatment plant. The units leverage a combined 500-kilowatt hours of solar generation and more than a megawatt hour of battery storage, providing electric reliability for critical infrastructure and advancing the tribe's goals of increased energy dependence and reduced tribal energy expense. Given the microgrids are grid connected, EnTech Solutions managed the interconnect agreement with the local utility co-op.

Further supporting the tribe's budgetary needs, EnTech Solutions developed an Energy as a Service (EaaS) plan to finance the Bad River microgrids. This enables them to predictably budget their energy costs while realizing the reliability and sustainability the microgrids provide. Extra energy created by the units is able to be sold back to the utility, benefitting the tribe and the community. EnTech Solutions is also able to research and apply for all applicable grants and incentives to assist the customer with offsetting costs.

After installation and commissioning, EnTech Solutions is providing operational management and optimization of the microgrids with use of their IOE technology. Data gathered from the systems will be applied to a planned Phase 2 project for the Bad River to further support the energy needs of additional facilities on the reservation.

We are excited to be converting our tribal buildings to a solar and clean energy source, while providing another level of resiliency during utility outages.

-Daniel Wiggins, Jr.

Tribal Project Lead, Mishkiiziibii Natural Resource Department for the Bad River Tribe

MICROGRID SPECIFICS

ITEM	DETAILS
Technical summary	
Customer Load	Annual expected: 711.5 MWh (262MWh, 418MWh, and 31.5MWh)
Design Output kW	520kW (250kW, 250kW, 20kW)
Design Storage kWh	1,016kWh (426kWh, 568kWh, and 22kWh)
Design Solar PV Input	525.6 kW (200kW, 301.6kW, 24kW)

This material is based upon work supported by the Department of Energy, Office of Indian Energy Policy and Programs, under Award Number DE-IE0000115.