

Wind & Hydropower Technologies Program

Harnessing America's abundant natural
resources for clean power generation

NAWIG NEWS

THE QUARTERLY NEWSLETTER OF THE
NATIVE AMERICAN WIND INTEREST GROUP

SPRING 2009

As part of its Native American outreach, DOE's Wind Powering America program has initiated a quarterly NAWIG newsletter to present Native American wind information, including projects, interviews with pioneers, issues, WPA activities, and related events. It is our hope that this newsletter will both inform and elicit comments and input on wind development in Indian Country.

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Wind Farm Brings Jobs, Lower Energy Costs to Nome, Alaska

Jointly owned by Sitnasuak Native Corporation and Bering Straits Native Corporation, the 18-turbine, 1,170-kW Banner Wind Project in Nome, Alaska, is the state's newest and largest wind farm. The project was completed in December, and then the turbines were taken offline for repairs and adjustments. In August, the project will once again produce 10% of the energy needed in Nome, a city that usually generates 100% of its energy from diesel fuel.

The approximately \$5 million project should lower the energy costs for Nome, a city that pays in excess of 34 cents per kilowatt-hour and approximately \$5.26 per gallon of diesel fuel. It's estimated that the project will save approximately 200,000 gallons of diesel fuel on an annual basis (for a payback period of approximately 5 years). The project will set an example for the surrounding villages where the energy produced from diesel fuel is even more expensive than that produced in Nome. Once the project is complete, turbines will be installed in the surrounding villages to augment energy needs and create employment opportunities for those areas.



Western Community Energy/PIX16305

The Banner Wind Project in Nome, Alaska, was completed in December 2008.

The Challenges

According to Jerald Brown, vice president of Bering Straits Native Corporation, one of the first challenges with the Banner Wind Project was deciding where to site the turbines. Brown said that one of the sites under consideration was prone to heavy icing. A gold company owned another site but considered the location a prime target for extraction.

In May 2008, after deciding on Banner Ridge as the location to site the turbines, the logistical challenges of Nome, Alaska began. Project managers had to decide how to bring in the various turbine parts. If they chose air transportation, certain difficulties would be alleviated, but it would be expensive.

Ian Graham, project manager from Western Community Energy (WCE), the managers of the project, said that if they had shipped the parts by air as opposed to barge, it

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would have resulted in a ten- to twenty-fold cost increase. To keep costs down, they shipped the necessary equipment in by barge.

Graham said that the barge shipments came from Seattle and were on a 30- to 60-day cycle. Combine the long cycle with Nome's relatively small shipping window (when the ice melts in May through October when the ice forms again) and one quickly realizes the importance of coordinating part procurement within these constraints.

To complete the project prior to the beginning of winter, Graham said that it was essential for everything to be delivered on time and that no pieces could be lost or damaged during transportation. Everything had to be delivered in working condition.

"I was able to, believe it or not, miraculously obtain all of my procurements with few losses due to transportation," he said.

Graham also said that full coordination of the contracted entities needed to match up since most of the project was arriving on a sequence of four barge trips from Seattle. Though some of the barges did break down in mid-transport, everything came together fairly well. Any missing pieces and additions to the system were ordered and shipped by air in the most inexpensive way.

Graham believes that the risks involved with this portion of the process were very high because it could have brought the project over budget.

With winter quickly approaching and all pieces in place, the next step was construction. To erect the turbines, a crane was needed, and no entity in Nome could supply it. STG Inc., a construction management and service company based in Anchorage, was working in the area to drive foundation piles at the Rock Creek Mine. Western



STG/PX16307

The Banner Wind Project is comprised of 18 turbines.

Community Energy contacted STG to do a majority of the groundwork.

Brennan Walsh of STG said the company built approximately 3 miles of access roads, did all of the foundation work, and lifted the turbines into place.

According to Brian Jackson, principal of WCE, the availability of the crane resulted in changing the order of the work from what was originally anticipated.

"Normally you want to do turbines last. In this case, we went turbines first and saved wiring and trenching for last in order to get the crane off the mountain. When winter finally hits, it hits hard," Jackson said.

Working with winter's approach and the minimal amount of daylight in Nome that comes with it led to some interesting revelations.

"I was surprised at what we could do in winter. Eighteen hours a day, 7 days a week. People working in the dark with headlights. The key asset in every person's toolbox was their headlight," Jackson said.

During the height of construction, 50 people were employed. With the exception of four WCE employees, all were directly hired from Alaska. This included 30 individuals from Nome, of whom more than 80% are shareholders in Native Corporations. The remaining employees were hired from Anchorage. Construction was completed in December 2008.

Once the turbines were installed, the project leaders soon realized that the blade pitch needed adjustment, and the turbines were taken offline to correct the problem.



Western Community Energy/PX16303

The Banner Wind Project will save approximately 200,000 gallons of diesel fuel on an annual basis.

"It's a huge difference when turbines want to over-produce, which is why we had to pitch the blades back. The good news is we can adjust that, but we couldn't do it until this spring," Jackson said.

The intent was to adjust the pitch, which would reset the turbines to shut down at a lower speed, and then put them back online. Then one of the worst winters in recent years struck Alaska.

"For a 3-week period in February and March, either an ice storm or a blizzard struck every 3 days. Nothing was coming in or out. Everything was covered in ice. There was no way to service any of the turbines," Brown said.

To complicate the service issues, Alaska's Mount Redoubt Volcano erupted at the end of March, which temporarily affected flights into Nome.

Once the weather began to cooperate and work on the turbines resumed, another difficulty arose. According to Graham, officials from Entegri, the turbine manufacturer, discovered a problem with their EW50 turbine: a serial defect in the coupling of the generator shaft with the planetary and sun gear in the gearbox.

To remedy the problem, Graham said that appropriate spacers would have to be installed. He also said that since the turbines are in a harsh wind climate, a higher-grade metal was needed for the gear sets.

The turbines would remain off until the shipping window opened again and the appropriate parts could be brought in to correct the manufacturing defect. Entegri officials said that they will pay for the lost revenue during this shutdown and will perform all repairs free of charge.

"Entegri is being a very good partner in terms of supporting their product. They are standing behind it 100%," Brown said.

With the project nearly completed, one issue remains: a Power Purchase Agreement (PPA) with the local utility company must be agreed upon. According to Graham, the PPA will be the first of its kind in North America because it involves an independent power producer (Banner Wind) and an isolated diesel grid (Nome Joint Utility).

WCE managers usually negotiate PPAs prior to construction, but they considered this a special circumstance in which everyone had a huge learning curve. Furthermore, WCE and Banner Wind are negotiating the final price so that locals will not experience a rate increase while the project achieves acceptable returns.

To read the entire article, including plans for the Banner Wind Project and other Alaskan projects, visit the U.S. Department of Energy's Wind Powering America Web site at <http://www.windpoweringamerica.gov/nativeamericans/index.asp>. Author Frank Oteri is a writer and researcher for Wind Powering America.

Construction Begins on First Native American Wind Energy Project in Kansas

In an attempt to save an estimated \$120,000-\$150,000 annually, the Iowa Tribe of Kansas and Nebraska began construction on what will be the first wind energy project on Native American soil in Kansas.

According to Timothy Rhodd, Secretary of the Iowa Tribe of Kansas and Nebraska Executive Committee, the project has been in discussion since October 2007 when a new Executive Committee for the 4,000-member tribe was formed.

Almost a year later, tribal officials began working with EnerTech, a midsize-wind-turbine manufacturer also located in Kansas.

According to Dylan Jones of EnerTech, the pairing couldn't have been better.

"It's been a great match for us. They're in Kansas and our company is in Kansas. I'm very happy to be working with them," Jones said.

EnerTech analyzed the tribe's utility bills to discover which buildings on the reservation used the most electricity and which size turbines would be best suited for the Tribe's

needs. EnerTech found that three buildings used the most electricity on the White Cloud, Kansas reservation: the Tribe's casino, the Tribal Administration Office, and a third multi-functional building that houses the police department, a meal site for the elderly, and the reservation's health facility.

Currently, the foundations have been poured for the two smaller turbines that will power the Tribal Administration Office and the multi-functional building. Both turbines are 40-kW EnerTech E-13s with a life expectancy of 20 to 30 years.

Jones said that the turbine for the casino has not been selected yet and most likely the project will not be completed until the summer of 2010.

Though the number of jobs created by this project is minimal, the Tribe hired from within to do the necessary excavating for the foundations. Rhodd said additional tribal members will be hired to assemble the towers once they arrive.

The tribe received approximately \$43,000 in U.S. Department of Energy grants to help fund the project.

Once completed, the turbines are expected to pay for themselves within 5 to 6 years.

NAWIG Events 2009 Calendar

October 11 – 16, 2009

66th Annual Convention of the National Congress of American Indians — Palm Springs, CA

November 16-19, 2009

Tribal Energy Program Review — Denver, Colorado

http://apps1.eere.energy.gov/tribalenergy/upcoming_events.cfm#review

Useful Links

U.S. DOE Wind and Hydropower Technologies Program

• <http://windandhydro.energy.gov>

Wind Powering America • www.windpoweringamerica.gov

U.S. Department of Energy Tribal Energy Program

• www.eere.energy.gov/tribalenergy

American Wind Energy Association • www.awea.org

National Wind Coordinating Committee • www.nationalwind.org

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For more information contact:
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