

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

FALL 2004

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.

St. Paul Island: Looking Back to Find the Future

"Centuries of experience living in the wind have allowed us to merge our culture with this new technology for the benefit of future generations."

- Aleut elder comment at the blessing of the turbine

What began as an economic development program on Alaska's St. Paul Island turned out to be a prime example of a successful remote, high-penetration wind diesel project—and a source of tremendous pride for a Native Alaskan community.

In 1999, TDX Corporation, a Native Alaska developer and investor, began construction of a wind/diesel hybrid power station that would incorporate Alaska's largest wind turbine. The Vestas V27 turbine and twin Volvo diesel generators form an integrated package that provides low-cost electricity and heat. The high-efficiency power plant, located adjacent to one of TDX's large and underutilized industrial buildings, was designed to provide power to the 80,000-square-foot facility, allowing a variety of planned commercial ventures to be developed.

TDX funded the \$1 million power plant, and TDX shareholders were trained to operate and maintain the system on a full-time basis. Although the plant suffered some early setbacks due to improper design for the sub-arctic climate, the plant experienced 100% availability in 2004 and more than a 60% capacity factor in January of the same year. In 2003, the wind turbine provided almost 55% of the total electrical load (672,000 kWh out of 1,226,000 kWh). The turbine is on track to deliver similar performance in 2004.

The system includes two unique aspects: the wind-only and thermal components. During the winter months when the wind resource is strongest, the configuration of the plant allows the diesel generators to turn off, which in turn allows the wind turbine to follow the load requirements of the complex. Excess electricity produced by the turbine during these periods is routed to a thermal tank that pumps hot water around the facility, further decreasing fuel consumption otherwise used for heating the large complex. The project typically reduces diesel generator fuel consumption by 3,346 gallons per year and fuel for space heating consumption by 8,940 gallons per year.

TDX is currently in the early stages of a planned expansion of this facility. Two economic development programs, both requiring additional power capacity, are under development, and TDX plans to triple the wind generating capacity to support these two endeavors. TDX is evaluating larger alternatives to the plant's V27, which is no longer manufactured by Vestas. Pending the conclusions of an environmental assessment, TDX hopes to begin construction in the next year.

Villagers attend the commissioning and blessing of the TDX Power St. Paul Island power plant.

TDX Power/PIX13634



U.S. Department of Energy

Energy Efficiency and Renewable Energy

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Interview: Robert Gough, Secretary of Intertribal Council on Utility Policy (COUP)

How did you become interested in wind for Native America?

Tribes receiving Western Area Power Association (WAPA) hydro-power allocations were required to conduct integrated resource planning for all of their energy resources. I was the acting director of the Rosebud Tribal Utility Commission in 1995, and we arranged for an 18-month anemometer study of the Rosebud wind resource at the Tribal casino site. That study revealed a phenomenal wind resource on the Rosebud. In 1998, following the Native Peoples/Native Homelands Climate Change Workshop, reservation-based renewable energy was seen as a no-regrets strategy for Tribal energy self-sufficiency and for addressing global warming. The Northern Great Plains reservations have more than 200 gigawatts of clean wind energy potential. This is far more than needed to meet local demand, and it could help to power the country from the Great Plains.

What crucial elements are required for Tribes to capture wind energy?

Tribes interested in pursuing wind energy projects require four crucial elements: wind resource, technology, market, and transmission. The wind resource should reflect high average annual wind speeds of high consistency and duration with reliability in daily and seasonal frequency and direction. Using efficient technologies—including taller towers and larger generators—reduces the cost of the power. A market for Tribal wind power must precede project development, and transmission facilities must exist to carry the power to market. The more favorable each of these four crucial elements is, the less expensive the cost of the generated wind power will be.

What national policy reform is needed to encourage tribal wind development?

The playing field for the full range of energy resources needs to be level so that all of their costs and contributions are considered. Fossil fuel extraction costs are heavily subsidized by the taxpayers, and the price of pollution, legislated caps on insurance liability, unproven long-term nuclear waste storage proposals, and impacts on public health and environmental quality are put on society's collective tab. Other uncounted costs of our conventional power plant system include water consumption and heightened national security issues. In the future, we can add another item to the list: Emerging estimates for anticipated extreme weather-related disasters attributed to the rapid acceleration of greenhouse gas emissions into the atmosphere.

In today's markets, even without taking into account the societal costs of conventional power or the benefits of wind power, wind generation is competitive with new coal and gas projects.

What ownership models appear most attractive for Tribal development?

Tribal ownership and intertribal ownership are most attractive for Tribal development. Intertribal COUP and the Rosebud Tribe have



Robert Gough receives the U.S. DOE Wind Energy Program Outstanding Technology Acceptance Award 2004. Left to right: Peter Goldman, program manager, DOE; Pat Spears, Intertribal COUP; Robert Gough, Intertribal COUP; Tony Jimenez, NREL's Wind Powering America program; Larry Flowers, NREL's Wind Powering America program; Robert Thresher, director of the National Wind Technology Center, NREL.

joined forces to sponsor an environmental justice community revitalization plan to develop Tribal wind resources on the Great Plains. The plan has five distinct phases: Pilot (the 750-kW utility-scale tribally owned turbine at the Rosebud); Demonstration (a 30- to 50-MW tribally owned project at the Rosebud); Distribution (an 80-MW distributed generation intertribal-owned project of 10-MW clusters on up to eight reservations with tall-tower data, while the remaining reservations collect data); Expansion (10-MW projects to 50- to 150-MW projects at each site); and Replication (on other Great Plains reservations).

You've traveled extensively and visited with Tribal leaders. What concerns do they have over wind development on their lands?

The Tribes welcome the benefits that wind energy can bring, but they're also concerned about the potential impacts on wildlife (eagles, hawks, and prairie chickens) and habitat and the visual impacts in placement and siting. Wind turbines reach into the sky higher than the length of a football field, and in places like the Northern Plains and the Southwest, they can be seen for 10-20 miles away in parts of the landscape that might rarely see something taller than a cottonwood or a Ponderosa pine.

For example, the 750-kW turbine at Rosebud is probably the tallest structure, besides communication towers, west of the Missouri River in South Dakota. To give you a sense of scale, on most Indian reservations a second-story building is a rarity. So how and why turbines fit into an ancestral landscape is an important concern to be addressed.

Read the entire Robert Gough interview at www.windpoweringamerica.gov.

Wind Energy Symposium Attracts 42 Participants

The National Wind Technology Center (NWTC) near Boulder, Colorado, once again hosted the annual Wind Energy Applications and Training Symposium (WEATS) on August 25–28. WEATS is designed for project planners, developers, utility officials, and engineers who are considering wind energy development and want to learn more about wind energy technology applications. The 42 participants included 19 representatives from 14 Native American Tribes and organizations. Topics included wind energy fundamentals, resource assessment, small wind, and large wind. Activities included a tour of the NWTC, a visit to the Ponnequin wind farm, and a luncheon talk on CO₂ and climate

Wind/Diesel Workshop

The Wind/Diesel Workshop 2004, co-sponsored by the Alaska Energy Authority and the U.S. Department of Energy's National Renewable Energy Laboratory (NREL), attracted participants from all over Alaska, the lower 48 states, Europe, Australia, and South America.

More than 100 participants gathered in Anchorage and Girdwood from September 28–October 2 to share recent experiences with wind/diesel hybrid systems, discuss the latest technology developments, and introduce the concept to new attendees. Participants flew to Kotzebue, Selawik, and St. Paul villages to visit three commercial wind-diesel projects in rural Alaska and to talk with local operators and village leaders on the operations and value of retrofitting diesel mini-grids with wind turbines and associated controls.

In rural Alaska, the cost of fuel for home heating and power generation typically comprises 30% to 50% of the cost of power production. Wind/diesel hybrid systems generate electricity while displacing expensive, price-volatile fuel. These hybrid power plants have higher upfront capital costs, but because the cost of wind energy is not volatile, utilities can estimate future costs of operation more accurately.

DOE Tribal Energy Program Accepting Renewable Energy Grant Applications

The U.S. Department of Energy (DOE) is currently accepting renewable energy and energy efficiency grant applications under two solicitations.

The first solicitation, "First Steps Toward Developing Renewable Energy and Energy Efficiency on Tribal Lands," provides funds for strategic planning, energy options analysis or resource planning, energy organization development, and human capacity building related to sustainable energy efficiency implementation or renewable energy development. Applications are due by January 20, 2005.

change by Randy Udall, director of the Aspen-based Community Office for Resource Efficiency (CORE). Participant feedback was very positive—more than 90% of participants said that WEATS met their expectations.

WEATS 2005 is scheduled for May 11–14, 2005. This is the week prior to the annual U.S. wind industry conference, WINDPOWER 2005, which will take place in Denver this year. **The WEATS attendance fee will be waived for Native American participants.** If you are interested in attending WEATS 2005, please contact Tony Jimenez at tony_jimenez@nrel.gov or 303-384-7027.

Proceedings of the 2004 workshop are available online at http://www.eere.energy.gov/windandhydro/windpoweringamerica/wind_diesel.asp.



Wind/Diesel Workshop 2004 participants visited the wind turbine on St. Paul Island, Alaska.

NREL/PX 3622

2005 Calendar

- Jan. 18 **Wind Energy in Arizona: Resource to Reality** — Tempe, AZ
www.eere.energy.gov/windandhydro/windpoweringamericapdfs/workshops/2004_az_workshop.pdf
- Feb. 23–24 **Conference on Renewable Energy in the Upper Midwest '05** — Grand Forks, ND
www.undeerc.org/reconference/
- Feb. 28–March 2 **National Congress of American Indians Executive Council Winter Session** — Washington, D.C.
www.ncai.org/main/pages/national_calendar/ncai_events.asp
- April 3–6 **American Indian Higher Education Consortium's Annual Conference** — Albuquerque, NM
- May 3–5 **National Tribal Environmental Council 12th Annual Conference** — Green Bay, WI

- May 11–14 **Wind Energy Applications and Training Symposium (WEATS) 2005** — Boulder, CO
- May 15–18 **Global WINDPOWER** — Denver, CO
- June 13–16 **National Congress of American Indians Mid-Year Session** — Oneida, WI
- Oct. 30–Nov. 4 **National Congress of American Indians 62nd Annual Convention** — Tulsa, OK

Current Native American wind events can also be found on the Wind Powering America Web site at
www.eere.energy.gov/windpoweringamerica/wpa/na_calendar.asp

Useful Links

Wind Powering America • www.windpoweringamerica.gov
 American Wind Energy Association • www.awea.org
 U.S. Department of Energy Tribal Energy Program • www.eere.energy.gov/tribalenergy
 National Wind Coordinating Committee • www.nationalwind.org
 Windustry • www.windustry.org



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For more information contact:
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 1-877-EERE-INF (1-877-337-3463)
www.eere.energy.gov

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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