

# WINDLETTER

THE MONTHLY NEWSLETTER OF THE AMERICAN WIND ENERGY ASSOCIATION

Volume 23 Issue No. 7 – August 2004

## This month . . .

- **Technology Research Firm Bringing More Efficient Inverter to Market**
- **Small Wind Column:**  
*The Issue of "Payback" at Zoning Hearings*
- **Wind Energy News Briefs**  
*U.S. wind power market continues to be lackluster  
Invergeny wins Wisconsin wind farm bid  
Navitas planning 80-MW wind farm for Nevada  
Local citizens bring turbine to rural school  
New wind farm proposed for Virginia*
- **Project Announcements**  
*Colorado petition drive gets RPS on ballot  
State attorneys general file "public nuisance" suit to curb CO<sub>2</sub> emissions  
Iowa Supreme Court upholds right to net meter  
Democrats propose national goal of 20% renewables by 2020  
Non-profit group "greens" political conventions*
- **Technical Announcements**  
*Iowa moving forward with wind-to-hydrogen research facility*
- **New Business Members**

*The American Wind Energy Association WINDLETTER is published monthly, 12 times per year. Subscription rate: \$50 per year within the U.S., Canada, and Mexico. Subscription rate in all other countries: \$60 per year. Copyright American Wind Energy Association. All rights reserved.*

*Reproduction in whole or in part in any form without express permission from the publisher is prohibited.*

*ISSN 0747-5500.*

*AWEA, 122 C Street, N.W., Suite 380, Washington, D.C. 20001.  
phone: (202) 383-2500. fax: (202) 383-2505. Web address:  
www.awea.org*

## Princeton Power Begins Testing New Distributed Wind Turbine Inverter Technology

As part of a research effort to make distributed small wind turbines more cost effective for individuals, the U.S. Department of Energy (DOE) has undertaken an initiative to fund public/private partnerships into improved components and wind power systems. DOE and one of its national laboratories, the National Renewable Energy Laboratory (NREL), awarded a grant last year to Princeton Power Systems (PPS) to design and develop an advanced technology power inverter to control the power output from wind turbines, using its patented AC-link conversion technology. The "concept and feasibility system" prototype has recently been completed and hooked up to a test device that simulates a 50-kW wind turbine. For the next couple of months, PPS will collect data on the inverter to prove its efficiency, and to demonstrate power control at low and high speeds. DOE is investing \$588,834 for a research project expected to last 18-24 months.

PPS expects that the new inverter will be able to lower generator noise due to less voltage distortion, yield a higher system efficiency, and extend the generator's life, which means a quieter and less expensive wind turbine. The inverter is designed for a 50-kW wind turbine, and can be "stacked" for use in a 100-kW turbine. The company has been working with Bergey Windpower and Northern Power Systems to make the converter compatible with their wind turbines in development. "On today's advanced variable-speed small wind turbines, the power electronics are a critical link in the system," stated Mike Bergey, president of Bergey Windpower. "We are excited about Princeton Power Systems' AC-link technology, and look forward to assisting them in this important development program."

Darren Hammell, president and CEO of Princeton Power Systems, said that the AC-link converter is expected to operate at a system efficiency of 96-97%, whereas typical inverters in use today operate at full system efficiencies of 92-93%. That could lower the cost of energy by 30%.

The technology breakthrough that PPS is researching is advanced software control that allows use of a Silicon Controlled Rectifier (SCR) transistor instead of the Insulated Gate Bipolar Transistor (IGBT) that is usually used in wind turbine inverters. Hammell said that in the past, SCR inverters were not able to provide power that was compatible with the utility grid, because the SCR transistors were difficult to control, so there was too much distortion.

The next phase would be to optimize the component and package it as a commercial product.

PPS is a start-up technology company founded by four Princeton graduates. In addition to the inverter, it is also working on other power conditioning devices to enable renewable energy production and energy conservation. More information on Princeton Power is available at <http://www.princetonpower.com>.

The June *Windletter* contained information about two other grants that were awarded as part of DOE's research initiatives: a \$2-million award to Northern Power Systems to design a 100-kW NorthWind Wind Turbine for broad application, and a \$1.5-million development grant to a consortium of engineers and manufacturers headed by Dr. Woody Stoddard, of Amherst, Mass., to adapt reaction injection molding to medium-size wind turbine blades.

In the small wind turbine roadmap that AWEA developed in conjunction with DOE, specific areas of interest were identified that relate to future advances in distributed wind technology. These areas of interest include: 1) reduction in turbine system costs; 2) reduction in manufacturing costs; 3) improvements in reliability; 4) improvements in power electronics design and reliability; 5) reduction of noise; 6) development of better analytical tools; 7) improvement in overspeed control knowledge; and 8) development of more cost-effective, taller towers. The roadmap is available at <http://www.awea.org/smallwind/documents/31958.pdf>.

## **SMALL TURBINE COLUMN:**

### **The Issue of "Payback" at Zoning Hearings --Mick Sagrillo, Sagrillo Power & Light**

Over the years, I thought I had heard all the potential objections to residential wind systems until I witnessed one wind opponent suggest that the community should deny the applicant his permit because of the long "payback" period of the proposed wind system. The shocked applicant stammered, the zoning committee balked, and the permit was denied. The wind opponent smiled as he exited the meeting, having succeeded in blocking the wind installation, which he didn't want to look at.

The sad part of the event described above is that it has not happened just once, but dozens of times around the country.

Zoning committees are empowered to make decisions based on the zoning ordinances they have in place at the time of the building permit request in their respective communities. These ordinances typically revolve around the areas of public health, safety, and the general welfare of the community. I have never seen "payback" listed as a criterion in a building permit application. But I have seen permits for renewable energy systems denied based on specious arguments about long payback periods.

"Payback" for a renewable energy system is generally defined as the amount of time it takes for that system to pay for itself in energy savings. The payback period for a wind system can range from

several years to several decades, depending on the cost of the system and the average annual wind speed at the hub height of the wind turbine. Since the output of a wind turbine is directly proportional to the cube of the wind speed, the average wind speed of the site is actually more critical to the payback period of a wind system than is the initial installed cost.

If the only reason to install a residential wind system were to make money, only folks in very windy areas would put them up. However, people install wind systems for other equally valid reasons. I know people who have stated that their system is for their children's and grandchildren's future, or for a cleaner environment. There are people who put their dollars where their values are in terms of not wanting to consume fossil fuel or nuclear-generated electricity. There are folks who just want to support the technology. All of those reasons are more in the community's interest than whether or not the owner will make money on it.

In the arena of zoning decisions, the motives of the applicant should not be on the table. What would happen if communities began licensing only vehicles like the Toyota Prius or Honda Insight that get 50-plus miles per gallon, while refusing to license huge gas-guzzling SUVs? After all, they do have a better payback. Or what would happen if a zoning committee questioned anyone interested in installing a swimming pool, which actually increases the liability insurance coverage required for the residence while bringing little if anything in the way of resale value? Imagine the reaction to any zoning committee that ruled out keeping a boat on one's property because boats have poor returns on investment (unless one is in the business of shuttling people around). Or consider the payback of a flagpole. Would any community tolerate that type of meddling in the personal choices people make with their hard-earned income and home?

Interestingly, pools, boats, and SUVs depreciate considerably in value from the time they are purchased, while wind systems not only maintain their value, they actually make money for the owner. These savings include the cost of electricity as well as the taxes one would have paid on it. And, wind-generated electricity with a residential wind turbine is inflation resistant, since, as electricity prices increase (as they inevitably do) the value of the electricity generated increases as well. Therefore, the case can be made that wind systems actually increase in value with time, something that cannot be claimed for boats or SUVs, for example.

Regardless of the above arguments, the bottom line is that zoning committees should not be examining the payback of a renewable energy system. It is completely irrelevant when reviewing a building permit request for a residential wind system.

copyright 2004 by Mick Sagrillo

[Editors Note: The opinions expressed in this column are those of the author and may not reflect those of AWEA staff or board.]

## **WIND ENERGY NEWS BRIEFS**

### **➤ Colorado petition drive succeeds in getting RPS in front of voters**

An initiative to require the state's seven largest utilities to purchase 10% of their electricity from renewable sources by 2015 gained enough signatures to make it onto the ballot for November. Volunteers for the Renewable Energy Initiative delivered nearly twice as many signatures as were needed. The campaign has also launched a new Web site to mobilize supporters at <http://www.RenewableEnergyYes.com>.

➤ **State attorneys general file “public nuisance” suit to curb CO<sub>2</sub> emissions**

Eight states and the City of New York filed suit recently against the five largest carbon emitters in the U.S. Plaintiffs are suing for substantial cuts in carbon dioxide emissions under the federal common law of public nuisance. The states filing the lawsuit include California, Connecticut, Iowa, New Jersey, New York, Rhode Island, Vermont, and Wisconsin. Companies named in the suit include American Electric Power Co., the Southern Co., the Tennessee Valley Authority, Xcel Energy, Inc., and Cinergy Corp. Together, they produce almost a quarter of the U.S. utility industry’s annual carbon dioxide emissions, and about 10% of the nation’s total emissions from all sources.

Plaintiffs claim that damages from global warming include more asthma and other respiratory disease; increased heatstroke and temperature-related mortality; loss of beaches, tidal wetlands, salt marshes, coastal property, fisheries; costly impacts to coastal and urban infrastructure (tunnels, subways, water treatment plants, and airport facilities) due to rising sea levels; loss of mountain snow pack; property damage; and human safety risks due to drought and floods. In addition to the adverse health effects for humans, potential effects could include widespread harm to fish and wildlife.

The attorneys general support the use of clean energy sources like wind and solar power as readily-available solutions to reduce carbon dioxide emissions.

➤ **Sweckers’ right to net meter upheld by state Supreme Court**

The Iowa Supreme Court has ruled in favor of the Sweckers, an Iowa family that has been pursuing the ability to connect a 65-kW wind system with a net metering tariff with the local utility for the past five years. The Federal Energy Regulatory Commission (FERC) had ruled in the Sweckers’ favor in late 2003.

Midland Power Cooperative (one of Central Iowa Power Cooperative’s members) had proposed a separate billing approach, under which two separate measurements would be required, allowing Midland to collect its full retail rate for energy sold, but pay only its avoided cost for the electricity purchased.

In its ruling, the state Supreme Court affirmed the district court’s finding that net metering is to be used in settling accounts between the utility company and its cogenerating customers. It ruled that separate billing is inconsistent with the interpretation of the Public Utility Regulatory Policies Act (PURPA) and federal regulations by the Federal Energy Regulatory Commission (FERC) and the Iowa Utilities Board.

➤ **Democrats propose national goal of 20% renewables by 2020**

Democrats favored increased incentives to develop domestic renewable resources in the party platform revealed at the national convention held at the end of July. The platform supports a national goal of “producing 20% of our electricity from renewable sources such as wind, solar, biomass, geothermal and hydrogen by 2020.”

At the convention, Sen. Maria Cantwell (D-Wash.) delivered a speech specifically on the topic of a “21<sup>st</sup> Century energy plan.” According to her speech, a Democratic administration would, “invest in wind power, wave power, solar power, hydrogen power and the ingenuity of American brain power.” She added, “John Kerry is going to lead our generation of Americans to energy independence.”

➤ **Non-profit group “greens” political conventions**

The Coalition for Environmentally Responsible Conventions (CERC), as part of its mission to promote environmental best practices for large conventions, has acquired renewable energy certificates (RECs) to match the electricity projected to be used at Madison Square Garden for the Republican National Convention. Con Ed Solutions donated the RECs generated at the Fenner wind farm in Madison County, New York.

CERC also purchased RECs to match the electricity use at Boston’s Fleet Center for the Democratic National Convention, which took place at the end of July. Those RECs represented the environmental attributes associated with wind power generated at sites in Massachusetts and Colorado, low-impact hydropower generated in Connecticut and landfill gas power generated in California. Constellation NewEnergy also donated RECs as part of its electricity supply.

In addition to “greening” the conventions’ electricity use, CERC arranged for carbon credits to match the travel to and from the two conventions to be offset by carbon dioxide (CO<sub>2</sub>) credits and hotel stays for convention participants.

## **PROJECT ANNOUNCEMENTS**

➤ **U.S. wind power market continues to be lackluster**

In its second quarter market report, AWEA projected that less than 350 MW of new wind power capacity will be added in 2004 due to the expiration of the wind energy production tax credit (PTC) at the end of 2003. The report concludes that wind projects totaling more than 2,000 MW in capacity – enough to power more than half a million American homes – are awaiting the expected renewal of the PTC. The industry has installed less than 30 MW of new capacity so far this year.

AWEA’s list of proposed, publicly-announced wind power projects is available at <http://www.awea.org/projects>. Each of these projects could produce economic and environmental benefits in their communities. If the wind industry were to consistently grow at a rate of 18% per year, AWEA said, six percent of the nation’s electricity could be generated by wind power by the year 2020, resulting in over \$100 billion of investment. Over the last five years, U.S. wind capacity has expanded at an annual average rate of 28%, showing that the supply chain can ramp up quickly to meet the nation’s power needs. Without a PTC extension, however, the U.S. will likely see very few new installations this year.

➤ **Invenergy wins bid to build new Wisconsin wind farm**

Three Wisconsin utilities announced that they would contract to buy the output from a new wind farm to be developed by Invenergy Wind in southern Fond du Lac and northern Dodge counties. The project is to be called the Forward Energy Center and is expected to be operational as early as August, 2005.

Wisconsin Public Service will purchase the output from 70 MW, Madison Gas & Electric (MGE) from 40 MW, and Wisconsin Public Power, Inc., (WPPI) from 20 MW, making the new wind farm at least a 130-MW project.

The project is now awaiting approval from the Public Service Commission of Wisconsin and local governments in Dodge and Fond du Lac counties. Additionally, an application for transmission access will need final approval by the Midwest Independent System Operator.

➤ **Navitas planning 80-MW wind farm for Nevada**

The Bureau of Land Management (BLM) Winnemucca (Nev.) Field Office reports that Navitas Energy of Minneapolis, Minn., has submitted a proposal to build a wind power project in the Dry Hills near Nevada's Osgood Mountains. The project, to be called the Getchell Wind Farm, would generate up to 80 MW of electricity.

The proposed project would consist of up to 40 wind generators. The two substations and five of the wind turbines would be on private lands. The remainder of the facility would be on public lands managed by the BLM. Navitas proposes to begin construction in late spring of 2005 and anticipates completing the project 6-9 months later.

➤ **Local citizens bring wind turbine to eastern Colorado school**

Wray School District RD-2, a small rural school in Yuma County in eastern Colorado, has announced plans to purchase and install a large-scale wind turbine. Wray will be the first school in the state of Colorado to own its own turbine.

The turbine will have a capacity of up to 1.5 MW, enough to power the school and provide some excess power to the town. The school district is working with Valmont Industries of Valley, Neb., to install a prototype of that firm's self-erecting tower. The project is expected to be producing power by next spring or early summer.

The approximately \$1-million project has been fully funded by gifts and grants from multiple sources, according to Michael Bowman, a volunteer member of the steering committee that has been working for two years to make the project a reality. His grandmother, Eva Bowman, donated a \$200,000 gift to the school on behalf of the family.

➤ **New wind farm proposed for Virginia**

A new development company called New Highland Wind has submitted an application for a special-use permit to build a wind farm in Highland County, Va. The application proposes a 20-turbine wind farm on Tamarack Ridge and Red Oak Knob.

## **TECHNOLOGY NEWS**

➤ **Iowa moving forward with wind-to-hydrogen research facility**

The city council of Ames, Iowa, has voted in favor of installing two 1.5-MW wind turbines as part of a project to research using wind power to create hydrogen.

The U.S. Department of Energy's Ames Laboratory has been working with Iowa State University (ISU) and the city of Ames to get the research project off the ground.

The developers of the project envision the turbines providing electricity for the city of Ames as well as producing hydrogen for the Ames Laboratory during periods of non-peak electricity demand.

The \$6 million in funding for the construction and maintenance of the wind turbines will come from grants from the Department of Energy as part of the agency's hydrogen research initiative.

## **AWEA WELCOMES THE FOLLOWING NEW BUSINESS MEMBERS:**

### **CORPORATE**

#### **Ventus Energy Systems**

Moorhead, MN

Contact: Mr. Tim Mehl,

[tmehl@ventusenergysystems.com](mailto:tmehl@ventusenergysystems.com)

[www.mwsci.com](http://www.mwsci.com)

#### **Hailo LLC**

Commack, NY

Contact: Oliver Hirschfelder,

[ohirschfelder@jlu.de](mailto:ohirschfelder@jlu.de)

[www.hailo.com](http://www.hailo.com)

#### **Earth Systems Southwest**

Bermuda Dunes, CA

Contact: Mr. Shelton Stringer, [sstringer@earthsys.com](mailto:sstringer@earthsys.com)

[www.earthsystems.com](http://www.earthsystems.com)

#### **Avanti**

Hilleroed, Denmark

Contact: Soren Midtgaard, [sm@avanti-online.com](mailto:sm@avanti-online.com)

[www.avanti-online.com](http://www.avanti-online.com)

### **ASSOCIATE**

#### **Texas Parks and Wildlife Department**

Austin, TX

Contact: Ms. Kathy Boydston,

[kathy.boydston@tpwd.state.tx.us](mailto:kathy.boydston@tpwd.state.tx.us)

[www.tpwd.state.tx.us/](http://www.tpwd.state.tx.us/)

#### **Machine Building Specialists, LLC**

Manitowoc, WI

Contact: Mr. Jeff McLaughlin,

[gkmcl@msn.com](mailto:gkmcl@msn.com)

---

### **AWEA Staff:**

Randall Swisher, *Executive Director*

Thomas O. Gray, *Deputy Director/Director of Communications*

Mary Childress, *Director of Finance & Administration*

Kim Dresser, *Director of Membership Services*

Stephen Miner, *Conference and Education Director*

Jaime Steve, *Legislative Affairs Director*

Kathy Belyeu, *Strategic Communications/Windletter Editor*

Stefanie Brown, *Conference Manager*

Marissa Bundy, *Conference and Education Assistant*

Jon Chase, *Deputy Director of Legislative Affairs*

John R. Dunlop, *Great Plains Representative/Standards Manager*

Sakura Emerine, *Education Manager*

Norie Flowers, *Assistant to the Executive Director*

Mike Jacobs, *AWEA Eastern Regional Representative*

Laurie Jodziewicz, *Communications & Policy Specialist*

Krista Koberlein, *Membership Services Coordinator*

Lisa Murphy, *Senior Accountant*

Christine Real de Azua, *Assistant Director of Communications*

Judy Sison, *Accountant*

Liska Wilkins, *Public Information Specialist*

---

### **Consultants:**

Ron Lehr, *AWEA Western Regional Representative*

Heather Rhoads-Weaver, *Small Turbine Advocate*

Doug Ward, Valerie Strauss, *Windpower New York*