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Reno Site Offers Comparison Shopping for Home Wind Turbines

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Small turbine sales are increasing every year, but useful data on the amount of electricity the turbines generate is still hard to come by

By Maria Gallucci

In a push to promote urban wind power, city officials in Reno, Nevada, are helping consumers take the guesswork out of buying home turbines.

The city has launched an online consumer guide called the Green Energy Dashboard that allows potential buyers to track performance of nine different turbines at four sites throughout Reno, including the city hall and a water treatment plant.

Last month, data collected on wind speed, wind direction and potential energy production began streaming in real time to the three-dimensional, interactive Wind Resource Map.

The goal is to show homeowners and businesses how each turbine type might fare in their own communities — and where wind resources exceed the city average. Most of the turbines were installed at the end of last year.

"We're an area known for being windy. But we weren't sure how good of a resource it was," Jason Geddes, Reno's environmental services administrator, said of the afternoon "zephyr" winds that blow down the slopes of the Sierra Nevada.

"The idea was to get some of these new urban turbines and show people what they're like," he told SolveClimate News. "We thought we could be that neutral source and go out and get our own data."

The smallest turbines, or micro units, range from .02 to .5 kilowatts, or enough electricity to charge a car battery. The larger turbines can reach 100 kilowatts and are an ideal size for generating power at large facilities with heavy electricity loads, according to the American Wind Energy Association (AWEA).

Wind towers in the Reno project — each a different make and model — range from 1.5 to 15 kilowatts, a scale suitable for pumping water at the three waste treatment plants included in the initiative, for example. An average utility-scale turbine, by comparison, can churn out 1,500 kilowatts, or 1.5 megawatts, of clean power.

Home Wind Bonanza, But No Solid Data

Nationally, small wind installations are steadily popping up as more people look to incorporate clean energy into their electricity mix, and as federal tax incentives ease the economic restraints on consumer-level wind power.

In 2009, U.S. sales on small units grew to \$83 million on 9,800 units — up 15 percent from 2008 sales — for a total of 20.3 megawatts in installed wind capacity, according to the latest figures from AWEA. The industry group is set to report 2010 figures in May.

Residential-scale turbines can cost from \$3,000 to \$50,000 to install, though a typical home wind system costs around \$32,000 for 10 kilowatts of capacity. A comparable photovoltaic solar system would cost over \$80,000 to install, according to AWEA.

If sales keep up, the group says it expects the U.S. market to reach 1,000 megawatts of total installed small wind capacity by 2015.

Despite the fanfare for small wind, however, useful information is still hard to come by, said David Rabkin of the Boston Museum of Science.

The museum's roof-mounted Wind Turbine Lab has tracked the progress of five small wind systems since 2009 as part of an ongoing exhibit. The project began after a turbine installed on Boston's city hall produced limited power and high costs.

"When we got into this and started looking at small wind, we found a real lack of experience out there in the world. There was a lot of marketed material, but not a lot of data. Not a lot of people could answer our questions," Rabkin told SolveClimate News.

Scientists and engineers working on the lab found that moving turbines even short distances could drastically affect the wind power potential, and building custom roof mounts could cost just as much as the turbine itself.

Turbine manufacturers couldn't say if ice would form on the blades, and one model shut down during bursts of gusty wind above 28 miles per hour. An ideal range for generating small wind power is 20 to 25 miles per hour, Rabkin explained.

"It has helped a lot of people understand that you need to know a lot about your turbine and the wind at your particular location before you can make any determination about how much electrical energy you're likely to get," he said.

Small Wind Part of Reno's Renewables Mix

In Reno, Geddes said that officials and residents had a "great interest in breaking down the barriers" to small wind as part of a larger effort to boosting its renewable energy profile.

The municipal government expects to get 15 to 20 percent of its electricity from wind, solar and geothermal energy by mid-2012. Efficiency measures are on track to help reduce municipal energy consumption by 30 percent next year, saving about \$1 million in annual costs, Geddes said.

The city is also likely to meet its goal to reduce greenhouse gas emissions by 20 percent by 2012 from 2003 levels.

To launch the small wind program, Reno used nearly \$1 million of city grant money to purchase and install the turbines, plus an additional \$550,000 to develop and run the three-dimensional wind map.

The funds are part of the \$2.1 million in Energy Efficiency and Conservation Block Grants awarded to Reno by the U.S. Department of Energy using 2009 federal stimulus funds. Nationwide, funding for the EECBG program totaled \$3.2 billion that year.

An additional 27 privately owned small turbines are already up in Reno at commercial buildings, homes and several school districts.

"We are being a leader so that we can stand up, show people what could be done and get others in our region and state to follow," Geddes said.

In 2008, Reno's Washoe County became the first in Nevada to pass ordinances for local wind development and to update its planning codes. Nevada is now one of nine states with legislation in place to streamline the permitting process.

Utility Offers Up to \$4-Per-Watt Rebate

State utility NV Energy also offers \$3-per-watt and \$4-per-watt rebates for customers with wind installations. Landowners can receive property tax exemptions for installing or hosting wind, solar, geothermal or hydroelectric systems.

Nevada law prohibits towns from banning wind installations, although some municipalities have passed restrictive ordinances making it impractical to set up large turbines, Geddes said.

The official said that if a surge in small wind power were to follow the turbine testing program and wind resources initiative, the city power grid could handle the extra wind power for at least the next decade.

More small turbines could be added to the nine-turbine project in the future, and some residents have offered to tie in their personal turbines to the study, he said.

"It's a great public outreach program," Geddes explained. "Everyone can see it and touch it."

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