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Small host of wind turbines is in the research and planning stages

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Several proposed Vineyard wind turbine projects are in early planning stages - for private residences, schools, municipal facilities, and businesses.

Federal and state grant money and incentives for using renewable energy make wind turbine projects enticing. But, those involved in the evaluation process must weigh the projected costs savings against the initial outlays and projected payback time, as well as maintenance costs.

A model project

In researching model wind turbine projects for Martha's Vineyard Public Charter School (MVPCS), consultant Brian Nelson examined one operated by the Spirit Lake Community School District in Iowa, the first school district in the U.S. to use wind power as a primary wind source.

In 1993, Spirit Lake put up a 250-kilowatt (kW) wind turbine 800 feet behind the elementary school playground, according to Jim Tirevold, Spirit Lake schools facility director. The turbine feeds the electricity it creates directly to the school. The rotor's hub is at the top of a 140-foot tower, and the rotor has a 90-foot diameter.

The school put up a second, larger 750-kW turbine in 2001, which feeds directly into the electrical grid. The tower stands 180 feet to the hub, and the rotor has a 156-foot diameter.

Both turbines were financed with grants and no- or low-interest loans. The smaller turbine cost $239,500 and the larger one $780,000. A loan on the smaller turbine was paid off in 1998. Since then, it has generated about 200,000 kW for the district, earning $20,000 to $25,000 through sales of electricity back to the utility.

Although the school district hoped to pay off the larger turbine by 2007, Mr. Tirevold said payments were reduced to address other budget items, which will make the payback period longer. However, he added, instead of using money from the general fund, the money saved on electricity goes towards the low-interest loan payment. Once the turbine is paid off, the school district expects to save about $120,000 in electricity costs a year.

Maintenance costs run about $15,000 a year for the large turbine and $2,500 a year for the smaller one, Mr. Tirevold said.

The big picture

Many individuals and organizations considering larger wind turbine projects have been keeping a watchful eye on a 248-foot tall, 660 kW turbine installed at Mass Maritime Academy (MMA) in Buzzards Bay in 2006. The overall project cost $1.34 million with funding from the Massachusetts Renewable Energy Trust and the state's Department of Capital Asset Management.

MMA director of facilities Paul O'Keefe said the turbine is producing at about a 20 percent capacity factor, saving the school roughly $170,000 a year in avoided energy purchases. With the funding received, Mr. O'Keefe estimates the payback time is about five years for a machine expected to last 20 years.

As a reference for gauging the height of wind turbines, the regional high school's tower is 100 ft. tall and the top of the blade tips 112 ft.
Photo by Ralph Stewart

Up-Island efforts

In addition to the Charter School's interest in wind energy, members of the Up-Island Regional School (UIRS) Energy Committee, chaired by Shelton Bank, are pursuing the idea of installing a 201-foot, 250 kW wind turbine at West Tisbury School. A wind site survey conducted in January 2007 identified the school as a favorable site. Because it is 2.2 miles from Martha's Vineyard Airport, the Federal Aviation Administration approved a wind turbine height of 201 feet or less.

With West Tisbury, Chilmark, and Aquinnah in agreement on pursuing a wind feasibility study, Mr. Bank said the committee currently is writing a Request For Proposals and hopes to send that out next week, in order to apply in August for a Large Onsite Renewable Initiative (LORI) grant from the Massachusetts Technology Collaborative (MTC).

"People want to know if this thing will pay for itself - that's what we hope to learn," Mr. Bank said. West Tisbury School spends about $75,000 a year for electricity, so the school might be able to save about 60 to 75 percent of that, based on wind generation.

"I think the numbers people use are a payback period of five to nine years, so if we save $50,000 a year, that's a half a million dollars in 10 years," he estimated.

Mr. Bank said the UIRS Energy Committee held a meeting with abutters to the West Tisbury School property and tried to answer all their questions. The committee plans to continue holding public meetings and putting information on a website.

"There are some misconceptions and some honest concerns," he said. The biggest is noise, he added. In polling about 150 towns with wind turbine projects, Mr. Bank said the committee found that noise is the most common complaint.

"The visibility issue is fascinating - some people like the way wind turbines look," he added. "One of things we'll do is to have a sightline study so you can go to someone and say this is what it will look like from your house."

Islanders already have raised similar concerns. In the spring of 2007, several residents in the Deer Run neighborhood near the high school asked the school committee to consider another site for a 100-foot wind turbine erected behind the school, because of its visual impact and noise issues.

South Mountain Company (SMC), contracted to construct, install, and maintain the turbine, made some adjustments to lessen the noise. Lately, the turbine has not been in operation, because SMC is installing wiring and mechanical upgrades from the manufacturer.

Although the purpose of the high school's wind turbine is mostly education, SMC renewable energy sales manager Rob Meyers said it is on track with expectations, producing 12,000 to 14,000 kilowatt hours of electricity a year, which does save some money.

The project was cost-free for the high school, made possible by a donation from Island resident Nan Rheault, now deceased, and a state-funded small renewable initiatives rebate from MTC for $30,000 that will cover maintenance costs for the life of the turbine, estimated at 30 years.

As more wind turbine projects come to the attention of Island town officials, discussions are taking place about the need for a review process and possible zoning bylaw changes by individual towns. The Chilmark planning board plans to hold public meetings and survey voters on the subject.

Aquinnah, which already is designated by the Martha's Vineyard Commission as a district of critical planning concern (DCPC) as a town, took a decisive step in proposing an energy overlay to address renewable energy facilities, and wind turbines in particular. The proposed energy DCPC regulations will go before voters at a special town meeting on June 19.

Only one wind tower would be allowed per lot. Groups of homeowners would be allowed to pool their resources to erect a wind tower. The regulations restrict wind facilities in specific areas of town, including the Moshup Trail and Cliff DCPCs, but allow for placement depending on the public benefit of the facility. Siting guidelines are intended to minimize visual impact.

The Martha's Vineyard Commission currently is developing an energy and environmental building policy, which contains a brief section addressing site design for renewable energy generation.

In the meantime, at the Martha's Vineyard Commission's April 10 meeting, discussion regarding an upcoming hearing on Aquinnah's energy DCPC prompted disclosures from several commissioners about plans for windmill projects of their own.

Since the Martha's Vineyard Commission may consider the possibility of requiring review of windmill projects of a certain size as developments of regional impact (DRI), Edgartown commissioner Jim Athearn said he wanted to disclose he was planning to put up a windmill on his property. However, it is likely to be up and running before new DRI regulations go into effect.

West Tisbury commissioners Linda Sibley and Andrew Woodruff also volunteered that they are considering wind turbine projects on their properties.