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Wachusett Mountain Enters New Era of Wind Power

PRINCETON, Ma. – This season skiers and riders will see a new site on the summit of Wachusett Mountain – two new windmills!

Wachusett has become the site of the only mountain-top wind farm in New England as the Princeton Municipal Light Department has erected two towers, each with 1.5 mega-watt wind turbines and 135-foot-long blades.

The foundations for the two new wind mills were installed this summer and construction of the two towers will be completed prior to the start of the 2009-2010 ski season.

While a series of eight smaller windmills have dotted the mountain landscape and supplemented town energy costs for nearly 25 years (one of the oldest wind farms in the US), the two new turbines will help to reduce energy costs for town residents. Located adjacent to the ski area summit on the back side of the mountain, the new windmills are expected to generate up to 40 percent of the power for the town's energy needs.



"We are very excited about the Wind Farm project," said Wachusett Mountain General Manager David Crowley. "We are pleased to see the Princeton Municipal Light Department able to bring this to fruition at the summit of the mountain."

As part of the mountain's commitment to green energy, Wachusett has also partnered with Suez Energy utilizing Renewable Energy Credits to help offset energy costs. For a complete list of Wachusett's energy-savings and environmental programs, go to www.wachusett.com. For details on PMLD's windfarm, visit www.pmlld.com. (See article below.)

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Something's in the wind in Princeton -- New windmills will recall historic event

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Photo simulation provided by PMLD.

PRINCETON — In September 1984, the switch was flipped to begin operation of eight windmills at the Richard F. Wheeler Wind Generation site off Westminster Road.

This September, nearly 25 years to the day since that historic event, another switch will be flipped. This time, only two windmills at the very same site will begin whirring. But their sheer size and ability to generate power for the town of Princeton dwarfs that of their forebears.

Twenty-five years ago Princeton was one of the first towns in Massachusetts to operate a public wind farm site. Its creation was sparked by a town vote in 1979 in which citizens rejected the offer to purchase power from the Seabrook Nuclear Power Plant. A citizen advisory committee charged the Princeton Municipal Light Department to investigate alternative sources of electricity.

At a special town meeting in January 1984, voters unanimously authorized the Board of Light Commissioners to construct a windpowered electric generating facility. The Princeton Municipal Light Department purchased 16 acres for \$7,400 from Stanley and Josephine Porter off the northeasterly side of Westminster Road.

Residents also appropriated \$550,000 to pay for the windmills. Eight 40-kilowatt Energetech wind turbines atop 100-foot towers were erected during the summer of 1984. The original plan had recommended approximately 500 total kilowatts of capacity on 164-foot towers, but PMLD didn't install the recommended size and number of units due to the high cost. The result was less energy generated than the projected 10 percent of the town's requirements.

"Basically, the towers were too short," says current PMLD Manager Jonathan Fitch. "I believe the reason they didn't produce the expected amount of energy is the shorter towers were surrounded by a mature tree line. The wind resource at the lower height and the 50-foot tree canopy were factors in contributing to lower than expected amounts of renewable energy being produced."

The windmills never produced more than 2 percent of the town's energy needs. By contrast, the new turbines are expected to generate about 40 percent of the town's capacity.

Over the years, lightning strikes and aging took their toll on the windmills and the cost to maintain them became impractical. In 1999, PMLD commissioners and Fitch began looking at options for the wind farm's future.

In 2002, the light department turned off the turbines. Five of the units weren't operational and the small amount of electricity produced by the remaining generators didn't justify the high cost of maintenance and repairs, Fitch said.

The turbines were dismantled in 2003-04. Most of the windmills went to Central Maine University to the mechanical engineering department. The Henry Ford Museum in Michigan installed one of the windmills at the museum as an example of first-generation wind technology. The last of the original windmills was sold to a Korean firm for \$15,000.

Once the PMLD decided to upgrade the wind farm, a survey was sent to residents, with 78 percent of respondents favoring larger, more efficient units. Wind resource tests were conducted, and informational meetings began. Over

the next several years, noise studies, photo simulations, shadow analysis, wind data analysis, National Heritage and Endangered Species studies, a bird-risk study, solar and shadow-flickering analysis, and site plan reviews were done. More than 24 public meetings were held, and bylaw changes were put into place. Eventually, a proposal was made to erect two 1.650-megawatt wind generators on 230-foot towers.

A special town ballot was held on February 11, 2003 and a 74 percent majority of Princeton residents approved the wind farm project. Since the original equipment was installed more than two decades ago, the wind industry has matured significantly, Fitch said. Equipment reliability and cost effectiveness have improved. "Cost-effective wind energy production only occurs by investing in larger capacity systems. The larger the capacity, the more cost-effective a wind farm becomes. Also at higher heights, a given turbine will generate more electricity due to typically higher than average wind speeds," he said.

The new towers, which will be shipped from Minnesota, are expected to be delivered around the first week in August, Fitch said. The 135-foot-long blades, shipped from South Dakota are due to arrive the second week in August. The turbines, which weigh 65-70 tons each, are due to arrive from Germany about the third week in August.

Since the project was initially proposed, new cranes have been developed that don't require as many trucks to deliver the parts, according to Fitch. Originally, it was expected that multiple trucks would have to bring crane equipment to the wind site. Now it can all come in on one or two trucks, he said. "We're going to have a crane with tracks that will be assembled on site."

Cross-country trial runs, or "recons," have already been conducted to make sure that all the equipment being carried on trucks can make it over or under bridges on the routes to Princeton. "There are 70 bridge crossings in Massachusetts alone," says Fitch. "An engineer had to sign off on each of them for safety. We had to get a permit from MassHighway for each of the bridges, saying it was safe. That cost \$1,000 a bridge for the engineer." That cost was built into the overall project.

The blades require a certain turn radius, says Fitch. The test drive was done using a 135-foot stick on a truck to test the route. "You can't just drive over any highway. It has to be permitted and the route has to be made known in advance," he notes.

The towers will come on three trucks in three sections, each about 70-feet long, and are extremely heavy. "We're probably going to have to have a bulldozer in front and in back of each of the trucks to push-pull the trucks up the hill," Fitch says. "That's typical of this kind of site. Most wind farms are on ridges and don't have paved access roads."

The blades are fiberglass and steel and weigh about six tons each. They will arrive on big carriers, possibly three to six trucks, he says. Once all the equipment is on site crews will spend a week preping all the pieces. "We'll test the generator on the ground before it's erected. Then we'll put it all together and expect to have it up and running by then end of September. We'll have a ribbon-cutting ceremony in October or November," Fitch says.

"Once the generators are operational, if in any certain hour they produce more energy than the town needs, it will automatically go into the grid. If that happens we'll get credit for that excess energy. Once the windmills are producing electricity, it will help stabilize our rates, now and for the next 16 to 20 years."