



Photos: General Electric Company / Lloyd Herziger

Searsburg, Vermont: The Green Mountain Power wind farm (6.0 MW) has been up and running since February 1997

No vision seems to be too impossible

It has taken years to create favourable market conditions in the 11 north-eastern states of the US - now wind power is emerging.

A single wind turbine gently spins in the coastal winds off Boston Harbor's South Shore. The 600-kW Vestas V-47, owned by the Hull Municipal Lighting Plant, is the talk of the town. "People are starting to use the word 'sculpture'," says Hull's operations manager John MacLeod, "and they're starting to ask when the next one goes up."

The tiny Massachusetts municipal utility uses the wind power it generates to offset the electricity it needs for the city's street lights. Officials expect savings of at least \$50,000 in the first year of operation - savings residents see on their utility bills. A highly visible, urban installation, embraced by the public it serves, Hull's single wind turbine is a friendly signal for the north-eastern states.

It has taken years to create favourable market conditions in the 11 north-eastern states, the most populous region in the United States. "I would call it emerging," says

Attorney David Wooley, north-east state representative for the American Wind Energy Association (AWEA). "The pieces are falling into place to where we could see 1,000 megawatts (MW) of wind power here by 2005." Wooley's estimate sounds optimistic considering that the region has only about 78 operating MW at the moment, but the optimism may well be justified. Positive policy initiatives are surfacing here, and more and more developers are arriving to do business.

Wooley emphasises that nearly all the region's states are adopting policies that support wind power development. And as Atlantic Renewable Corporation's Sam Enfield asserts, "Growth happens where there are policies to encourage it." AWEA's Wooley emphasises that the widespread support wind power enjoys spans the region's partisan spectrum.

Favourable policies are as avidly supported by Republican governors

as they are by Democrats. And, two former governors, Tom Ridge of Pennsylvania and Christine Todd Whitman of New Jersey, now prominent members of the Bush Administration, promoted renewable energy for their states. Legislatures are also on board.

Massachusetts and New Jersey have enacted "renewable portfolio standards" (RPS) that require electric service providers to include set percentages of renewable generation to their resource mix. Government agencies in Maryland, Pennsylvania and New York are mandated to meet significant shares of their load with renewable power. These states, along with several of their neighbours with deregulated retail markets, are collecting "system benefit charges," that move millions of the dollars annually to underwrite renewable energy development.

Vermont and New York utilities will soon offer their customers the option of buying green power

through conventional utility bills. This initiative, which offers consumer choice within regulated markets, is likely to spread. As Green Mountain Power Senior Vice President Stephen Terry said in announcing his Vermont utility's programme, "we hope that other electric utilities will consider this new voluntary program as they develop ways customers can fight global warming."

"While our [policy] work seems slow day to day," says Wooley, "government decision-makers and citizens are finally getting it." Wooley notes that while much remains to be done in expanding the RPS and seeing to it that other favourable policies are implemented, he considers the Northeast is "a good place to do business."

The major barrier to wind energy's expansion in the Northeast, as elsewhere in the US, is in setting fair rules for transmission access and pricing. As of today, three independent transmission system operators (ISO) manage power within the region: NEPOOL in New England, NYISO in New York State and PJM in Pennsylvania, New Jersey and

the country. While we're pushing for capacity payments, and more flexible scheduling, network service is free and the rules in place so far are fair." The industry's overall experience at the project level has generally been positive. "Utility staff always start out sceptical," says Mark Haller, Zilkha Renewable Energy's vice president for technology, "but we've found that they come away impressed."

Haller cites Zilkha's experience with the Exelon-Community Wind Energy Projects, 50 miles south-east of Pittsburgh. "We were able to show Allegheny Power that by using Enron Wind Corp's 1.5-MW machines, 24 MW could be safely added at the end of an old, mushy 25 kV grid." This experience, Haller explains, showed that state-of-the-art wind turbines using advanced electronics (unlike old style induction generators), can be sited as large, distributed generation. "The projects demonstrated," Haller says, "that today's technology can help stabilise lightly loaded lines." This transmission achievement is sure to impress even the most recalcitrant utility personnel.

rectly into the NYISO. The retail giant committed to the purchase 4.5 million kWh before ground was broken on an 11.5-MW project located in central New York State.

Educational institutions are one sector where the green market has taken hold. Twenty-five Pennsylvania colleges and universities, for example, have signed on to purchase a portion of their electricity from the Exelon-Community Wind Energy Projects in Mill Run and Somerset County, Pennsylvania.

"Businesses and institutions are building the market by integrating green power"

Maryland. The interface between these systems is one of several serious barriers the industry faces. "Selling wind power into the Massachusetts RPS market," Wooley cites as an example, "is problematic." Crossing borders between ISOs, Wooley maintains, needs to be simplified.

And the systems' different rules need greater uniformity. When it comes to renewables, New York's ISO is the region's model, with capacity credits, fair imbalance and scheduling rules. "The PJM," on the other hand Wooley says, "still does not allow capacity credits for wind generation. It needs to follow New York's example [on this policy]."

The problems are real, but while the region's developers are pushing for improvements, they emphasise the positive. "The PJM pool is great," says Atlantic Renewable's Sam Enfield, "it is as good as anywhere in

Demand has pushed wind power in the Northeast further forward than probably any other region in the US. "There is a rich green market out there," Wooley says. Not since the heady days of California's deregulation has market pull played so prominent a role. "The Mid-Atlantic leads the nation in establishing a viable, competitive market," says Jan Hamrin, executive director of San Francisco's Center for Resource Solutions (CRS). "Businesses and institutions are building that market by making 'green power' a part of the way they do business."

An early example of this trend came when in August 2000, Kinko's, a retail copy house franchise, bought green tags equivalent to supply 50% of the power used by its New York stores. Kinko's purchased "Pure Wind" certificates from PG&E National Energy Group's Madison Windpower Project which sells di-



One of the schools, Bucknell University, in Lewisburg, will purchase one million kWh annually, replacing more than half the electricity the school purchases from traditional power plants. The liberal arts school's president, Steffen Rogers, recently told the press that "he was extremely pleased that Bucknell has the opportunity to participate in a totally environmentally-sound energy-producing system."

Other institutions are similarly motivated. In New Jersey, like Pennsylvania a deregulated market, religious leaders are urging congrega-

Pennsylvania: 16 1.5-MW wind turbines (GE Wind 1500) have been running at the Somerset and Mill Run wind farms since October 2001.



tions to consider "a 'higher power' when selecting an electricity supplier." The Partners for Environmental Quality, a clean air coalition with clergy representing eight denominations, are urging people "to buy electricity," Reverend Dr. Franklin Vilas, the group's leader, explains, "based on principle, not just price." This marketing initiative, co-ordinated with clean energy supplier Green Mountain Power, has helped jump start the green market in the "Garden State."

Meanwhile New Jersey state government has become, according to CRS, one of the cleanest-powered state governments in the nation. The state government's decision this spring to purchase 152 million kWh of green electricity, 12 per cent of the state's total consumption, was hailed by its supplier, Green Mountain Energy Company, as "leading by example."

Three other Northeast states have implemented government green power set-aside programs: Maryland at 6%, Pennsylvania at 5% and New York has set a goal of 10% renewable electric service by 2005, and 20% by 2010.



*David Wooley,
AWEA's northeast state representative*

State governments in the region are also promoting other avenues to pull renewables along. A year ago, New Jersey's Board of Public Utilities (BPU) announced that it was directing about \$45 million in system benefit charge dollars, for large and small wind energy development, over the next three years. David Wooley estimates that the state program will likely result in \$120 million for wind energy development over the full life of the BPU renewables programme.

In New York, the Public Service Commission (PSC) has earmarked

\$7.5 million annually over five years for development of central station wind power, and another \$1.2 a year for small-scale wind. The funding, according to the American Wind Energy Association, is expected to cover the addition of more than 200 MW of wind power capacity in the Empire State, or enough power to meet the annual energy needs of 84,000 homes.

Similar, but more modest funding from a 1996 PSC order helped establish New York's first two utility-scale wind farms in Madison and Wyoming counties. Even Rhode Island, a small New England state which deregulated its power grid in the mid-1990s, has committed to buying down the cost of renewables.

The growing popularity of green marketing either in the form of green tags or direct utility purchases, coupled with government incentives on the consumer side of the meter, have helped attract developers to the Northeast. Good will and government initiative can only set the stage; it takes developers to put megawatts in the ground. They are coming.

Five-year extension of the PTC seems possible

AWEA predicts continued expansion of wind power

The American Wind Energy Association (AWEA) applauded the passage by the U.S. Senate of a federal renewable energy portfolio standard ("renewables portfolio standard," or RPS) and a full five-year extension of the wind energy production tax credit (PTC) as part of the broad energy bill, S. 517. The bill also would create a new investment tax credit for small wind systems used to power homes, farms, and small business.

The RPS included in S. 517 would require that an additional 1% of the nation's electricity come from new renewable energy sources by 2005 and increase slowly each year thereafter, until renewable energy provides 10% of the national electricity supply by 2020. A credit trading system would be established so that utilities could comply with

the renewables requirement in the most cost-effective manner.

The PTC, which provides an incentive of 1.5 cents per kilowatt-hour (adjusted for inflation) for electricity generated during the first ten years of operation of a new wind plant, would be extended until Dec. 31, 2006. The new investment tax credit for small wind systems (75 kilowatts and below) would cover 30% of system costs for both residential and business uses. This tax credit was championed by Senator Dick Durbin (D-Ill.).

"Senate passage of an RPS marks a milestone in U.S. energy policy," commented AWEA Legislative Director, Jaime Steve. "The federal government has been talking about renewable energy for 25 years, but this proposal, if enacted into law, would

be the first concrete step toward making it happen. And the inclusion of a provision to extend the PTC makes this bill a real one-two punch for development of renewables: it will be extremely helpful in encouraging wind energy's continued rapid growth." Some \$3 billion worth of wind power investments (about 3,000 megawatts, or enough to supply the needs of 850,000 homes) are being proposed or planned for the next several years in the U.S., according to AWEA estimates.

S.517 now goes to a joint House-Senate conference committee where differences between it and the House-passed energy bill, H.R. 4, will be resolved. The House bill has no RPS provision, but does include a five-year PTC extension.

The region's first project and in some respects still a model, Green Mountain Power (GMP) completed its 6.05-MW Searburg Project in south-eastern Vermont in 1996. The project has run above projections, and demonstrates that wind energy development in forested land can work and that the more desirable ridgeline sites can be permitted.

"This part of the country can be more tedious [to permit] than many places," observes enXco's John Zimmerman who, while working for GMP permitted Searburg. "But we've proven that projects can be sensitively built. I expect we'll see more projects built in Vermont, Massachusetts and eventually New Hampshire and Maine."

Zimmerman sees considerable promise in ridgetops at higher elevations where turbines can be arrayed in strings. Projects that match this configuration can be found in New England, western New York State and the 70-MW Backbone Mountain Project Atlantic Renewable has planned for West Virginia. An approach more typical of the Middle West where block style configurations share cultivated ground with working farms, will be found more often, Zimmerman suggests, at lower elevations and offshore.

Developers comment that public acceptance has to date not been too difficult. Accommodations have to be made for scenic values, as Atlantic Renewable found in West Virginia, but developers have so far avoided controversy through careful site selection.

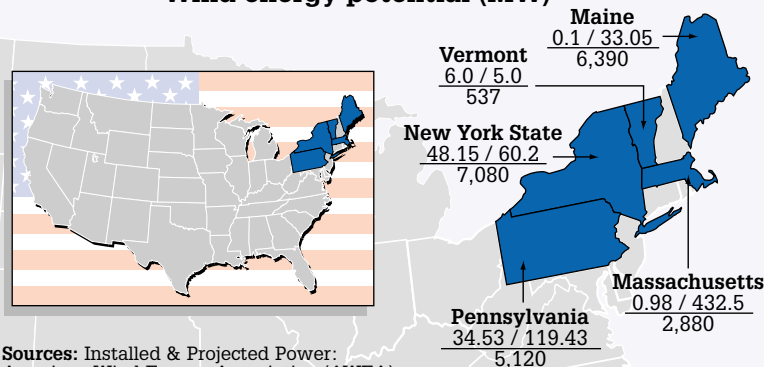
The developments that will and have attracted controversy are offshore. And it is offshore where Northeast developers can develop larger projects with compelling economies of scale, projects that are probably worth the public relations battles. Cape Wind Associates, a joint venture with ties to European wind energy developer UPC, is in the middle of just such a fight.

Cape Wind plans to erect 170 turbines (420 MW) five miles off the southern shore of Massachusetts' Cape Cod by 2005. The project to be sited in a shallows known as Horseshoe Shoal could power nearly a half million homes. Cape Wind Associates is actively opposed by fishing and tourist interests. One

Wind power in the Northeast (as of March 2002)

Existing projects (MW) / Proposed projects (MW)

Wind energy potential (MW)



Sources: Installed & Projected Power: American Wind Energy Association (AWEA)
Wind Energy Potential: Pacific Northwest Laboratory, 1991

New wind projects (>1 MW) in the Northeast

Location/State	Utility/Developer	Size/Turbines	On line by
Offshore Nantucket Island (MA)	Cape Wind Assoc.	420 MW	(?)
Waymart Wind Farm (PA)	Exelon Power	61.1 MW (Nordex)	2002
Flat Rock (NY)	ARE Corp.	50 MW	2003
Somerset II (PA)	ARE Corp. & NWP	40 MW	2002
Redington Mt. (ME)	Endless Energy	27.0 MW	12/2002
Bear Creek (PA)	Global Winds Harvest	18.2 MW (Nordex)	12/2002
Delaware Windpower (NY)	ARE Corp.	10.0 MW	12/2003
Hancock I (MA)	AllEnergy/DisGen	7.2 MW	2002
Hancock II (MA)	DisGen	5.3 MW	2002
Boundary Mountains (ME)	GE Wind	6.0 MW (GE Wind)	2002
Little Equinox (VT)	Endless Energy	5.0 MW	12/2002

opponent, Wayne Kurker, founder of Alliance to Protect Nantucket Sound, told the New York Times, that "a good portion of us who migrated to Cape Cod came to enjoy Nantucket Sound and if Nantucket Sound becomes an industrial, electrical area, then it's no longer the national treasure that people currently feel it is."

Cape Wind was encouraged when Robert Durand, Secretary of the Massachusetts Environmental Protection Agency, the state department responsible for reviewing the offshore proposal, recently announced that "symbolically and substantively, [Cape Wind] is an important step away from our crippling dependence on fossil fuels with all their attendant environmental, social, economic and political costs."

The movement to move wind power off shore was further encouraged in April 2002, when the Long

Island Power Authority (LIPA) released a study that identified a huge potential – as much as 2,200 MW of technically-achievable wind power – off the shore of Long Island, a large, mostly residential area due east of New York City. The reaction to the announcement to the LIPA study and to news that a public utility was inviting wind energy developers to Long Island was supportive. "When we consider the potential that wind energy presents to us, it's really extraordinary," Neal Lewis of the Long Island Neighborhood Network told Associated Press, "that it has not [already] been tapped."

It's a long way from a single turbine in Hull, Massachusetts, to the vision of turbines marching along off the shores of Long Island, but in the Northeast at least for today, no vision seems too impossible. ■

By Robert Kahn,
Mercer Island (USA)