

New England Wind Forum

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Regional Greenhouse Gas Initiative Moves Forward — What Does It Mean for Wind Power?

In early 2007, Massachusetts and Rhode Island announced their intent to join the Regional Greenhouse Gas Initiative (RGGI), a cooperative effort to reduce carbon dioxide (CO₂) emissions, the major contributor to global climate change. The impending implementation of RGGI has raised questions regarding the treatment of wind power (and other zero-emission renewable energy generation sources) within RGGI, and how RGGI may impact representations of wind power and its benefits. Some have argued that emissions will be reduced to RGGI targets with or without the help of wind. Analysis reveals, however, that wind power is essential to meeting and surpassing the emission reductions required to meet policy goals.

RGGI now includes 10 Northeast states: all six New England states and New York, New Jersey, Delaware, and Maryland. These states have set a cap on CO₂ emissions from the electricity sector, along with a tradable allowance mechanism encouraging efficient (least-cost) compliance – a “cap-and-trade” regime. Through a multi-year and multi-stakeholder process, RGGI member states have negotiated and signed a Memorandum of Understanding (MOU) committing them to state-by-state emission budgets (share of the regional cap) and have developed a Model Rule for implementing the cap-and-trade regime on a state-by-state basis. As the MOU commits participating states to cap CO₂ emissions starting in 2009, the New England states are now proceeding to formally approve RGGI participation (if required) and/or undertaking state rule-makings to implement the commitments based on the RGGI Model Rule. Any generator subject to the cap must possess an allowance for every ton of CO₂ it emits. Participating states plan to auction from 25% to 100% of their allowances to the CO₂-emitting generators. Such an auction will result in revenue to be used for consumer benefit or strategic energy purposes, including energy efficiency investments, renewable energy, innovative energy technologies, or consumer rebates.



The rotor is raised on the GE 1.5sle wind turbine at Jiminy Peak Ski Area in the Berkshire Mountains of western Massachusetts. (Photo credit: Sally Wright, Renewable Energy Research Lab, UMass/PIX15160)

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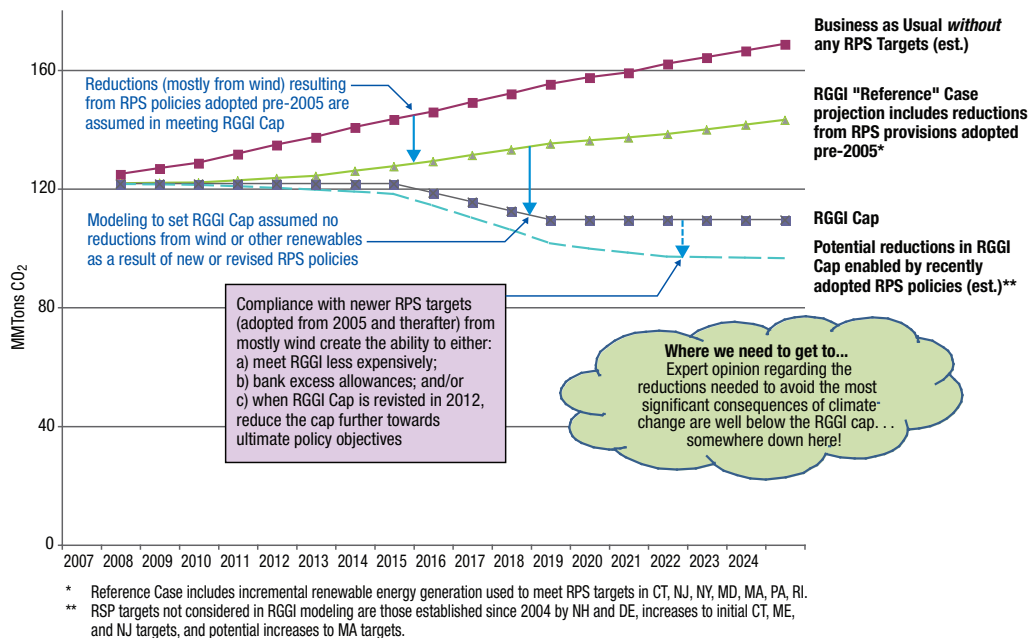


Figure 1. The impact of wind power on the RGGI CO₂ emission cap

Allowances not auctioned will be allocated to existing generators. More information can be found at www.rggi.org.

Wind developers need to understand the treatment of wind power under an RGGI cap-and-trade regime, as well as how they may benefit. Marketers or utilities selling wind power, and customers buying wind power, need to understand how RGGI may impact their sales, purchases, or claims regarding the benefits of wind. Policymakers and the public may find the interaction of a cap-and-trade emission reduction policy in the presence of the renewable portfolio standards (RPS, or a minimum percentage of electricity sales required to be sourced from renewable energy generation) in place throughout the region to be less than obvious. So what does RGGI mean for wind power?

If unfamiliar with the details of RGGI, one might anticipate that wind power and other zero-emitting generation sources would be critical players and big winners under a CO₂ cap and trade. What better way to reduce emissions than to introduce generation sources that create no emissions? On the other hand, emissions are capped whether or not more wind is added to the regional supply, right? Closer inspection, however, reveals a more complex picture. (Continued on Web site.)

The full text of this article can be found on the New England Wind Forum Pollutant Emission Reduction Policies Web page at www.windpoweringamerica.gov/ne_policy_rggi.asp.

By Robert C. Grace, Sustainable Energy Advantage, LLC

Wind Policy Update

Update on Federal Incentives and Policies for Wind

Production Tax Credit (PTC): The PTC, set at 2.0¢/kWh for 2007 and available for the first 10 years of project life, is currently available for projects in service by December 31, 2008.

In early August, the House of Representatives passed an energy tax bill containing a 4-year extension of the PTC containing a cap on its value for some projects; the Senate has yet to pass a corresponding provision, although extension proposals ranging from 3 to 5 years have been under consideration. Please visit the Tax Incentives page of the NEWF Web site at www.windpoweringamerica.gov/ne_policy_tax.asp for more details.

Renewable Energy Production Incentive (REPI): The REPI, a cash production incentive for tax-exempt entities and equal in value to the PTC, is authorized through 2026, with funding subject to annual appropriation. Qualified facilities must be online before October 1, 2016. Please visit the Federal

Grants & Incentives page of the NEWF Web site at www.windpoweringamerica.gov/ne_policy_federalgrants.asp.

Clean Renewable Energy Bonds (CREBs): In 2006, the IRS allocated \$800 million worth of zero-interest CREBs to governmental and cooperative renewable energy projects. An additional \$400 million will be allocated in 2007. Applications were due July 13. Examples of entities receiving last year's CREBs allocations for proposed New England wind projects include the Narragansett Bay Commission, the Town of Portsmouth in Rhode Island, and the New Hampshire Electric Cooperative. For a description and history of CREBs, please visit the Federal Grants & Incentives page of the NEWF Web site at www.windpoweringamerica.gov/ne_policy_federalgrants.asp.

Collaborative process on federal siting guidelines: The U.S. Fish and Wildlife Service (USFWS) issued interim guidelines in May 2003 to assist its staff in providing technical assistance to the wind industry to minimize the wildlife impacts associated with wind project development. In late 2006, a process compliant with the Federal Advisory Committee Act (FACA) was initiated to explore a coordinated state and federal agency approach to wildlife and wind siting issues and include a broad group of stakeholders in the guideline development process. The FACA process is expected to last approximately 2 years.

National Renewable Portfolio Standard (RPS): On August 4, 2007, the House passed a 15% RPS via an energy bill amendment sponsored by Representatives Udall (D-NM) and Platts (R-PA). In June, the Senate had considered but failed to adopt an RPS provision sponsored by Energy Committee Chairman Senator Jeff Bingaman (despite earlier indications of support from 50 Senators). This fall, a House-Senate conference committee will take up these bills for consideration and determine the fate of a federal RPS.

State Policy Updates

Connecticut: As the 2007 legislative session closed, the Connecticut state legislature passed, and the governor signed, a comprehensive energy law titled An Act Concerning Electricity and Energy Efficiency (HB 7432). The Act boosts the Class 1 RPS target (their tier which includes wind energy) from 7% by 2010 to 20% of load by 2020, making it the most aggressive renewable energy policy in the region. In addition, several other aspects of the new law support wind energy, including:

- Allowing utilities to meet their RPS requirements through contract for renewable energy certificates (RECs) of up to 15 years in duration, and requiring the Department of Public Utility Control (DPUC) to initiate a contested case to examine whether long-term contracts *should* be used to procure certificates.
- Expanding net metering to include facilities up to 2 MW in capacity and allowing residential net metering to qualify for the RPS.
- Introducing a property tax exemption for wind and other Class 1 renewables in one- to four-dwelling residential applications.
- Requiring the Department of Environmental Protection to adopt regulations to implement the RGGI and authorizing allowances to be set aside for voluntary renewable energy purchases.
- Increasing the requirement for utilities to enter into long-term contracts with Class 1 renewable energy generators from 100 to 150 MW that receive funding from the Clean Energy Fund and are located in Connecticut. While no wind was selected for contracting under the first 100 MW, this requirement may offer substantial benefit to Connecticut-based wind projects greater than 1 MW and interconnected directly to the utility grid.
- Requiring the DPUC to adopt interconnection standards that meet or exceed national standards.

Maine: On May 8, 2007, Maine Governor John Baldacci created a Task Force on Wind Power Development in Maine. The task force will review the regulations that affect the development of wind power projects in the state and recommend any changes necessary to ensure that Maine has a balanced, efficient, and appropriate regulatory framework for evaluating proposed developments. The task force will also monitor advances in wind power technology, identify benefits and incentives that might be available to communities considering wind power projects, help developers find the most appropriate locations for their projects, and propose goals for wind power in Maine for 2010 and 2020. The task force met for the first time on July 20, 2007.

Massachusetts: Massachusetts' 2007 legislative session has also included a number of proposals to revise the Commonwealth's RPS, with particular emphasis on proposed adjustments to hydroelectric and biomass facility eligibility. The most comprehensive proposal is from Senator Resor (Senate Bill 1977) and includes provisions for long-term contracts and eligibility of incremental energy from selected existing hydro

facilities. The bill also proposes RPS target increases of 0.5% annually from 2009 through 2011 and 1% annually through 2020.

Omnibus Energy Legislation proposed by House Speaker Salvatore DiMasi (House Bill 3954) proposes to reorganize the Commonwealth's energy and environmental agencies, redirect and repurpose the state's clean energy fund away from large-scale renewables in favor of green buildings and residential initiatives, revise and expand the RPS to include certain existing power generating facilities as well as additional technologies, and create a Clean Energy Facilities Siting Committee to develop a statewide list of public and private real estate that could be used for siting clean energy generating facilities. The Speaker's bill appears to be on hold until the fall. Revisions to the bill are expected, but no proposals have yet been released.

In addition, the Massachusetts Executive Office of Energy & Environmental Affairs (EOEEA) released a Model Amendment to a Zoning Ordinance or By-law: Allowing Wind Facilities by Special Permit (see www.mass.gov/Eoca/docs/doer/renew/model-allow-wind-by-permit.pdf). The EOEEA also has small wind bylaws under development. Subsequently, the office intends to look at clarifying the Department of Environmental Protection's Noise Guidance and Massachusetts Historic review process.

New Hampshire: During spring 2007, the New Hampshire legislature developed and passed an RPS. The bill passed by a wide margin and was signed by Governor John Lynch on May 11, 2007. The new law requires qualifying Class I technologies (including wind) to provide 1% of New Hampshire electricity requirements by 2010, ramping up to 16% by 2025. In addition, the state has established a stakeholder subcommittee to the Energy Policy Commission to develop a wind energy policy. Further, Senate Bill 140 was passed in June, initiating a process for clarifying and streamlining siting renewable energy generation facilities. It also requires that the Public Utilities Commission work with utilities and others to study upgrading and expanding transmission in the northern part of the state to encourage renewable energy development.

Rhode Island: The state has completed the first phase of the RIWINDS program (announced in 2006), an initial technical and economic feasibility review of the potential to meet 15% of the state's total electricity consumption from wind energy. The purpose of this initial study was to identify and prioritize the most viable sites for wind energy development in the state. The final report (available at www.energy.ri.gov/other/independence1.php), issued in April 2007, suggests that this goal can be achieved through a combination of onshore and offshore wind energy development. Among the next steps will be for the state to identify the variety of sources that may be interested in and capable of financing such facilities and to establish a stakeholder process to review initiative objectives. (For more info, see the Perspectives interview with Andy Dzykewicz, Commissioner of the Rhode Island Office of Energy Resources, on page 7).

Vermont: Governor Douglas vetoed the Vermont Energy Efficiency and Affordability Act (H.520) after it passed in the House and Senate. The bill included a commitment to produce

25% of the state's energy consumption from renewables by 2025; increased the net metering threshold from 15 kW to 250 kW; streamlined permitting of meteorological stations; further development of an RPS for Vermont; and a production-based property tax for wind projects. The property tax provision, whose calculation method and rate would be applied on a statewide basis, had so far been embraced by both government and industry. The Governor's veto was motivated by the inclusion of a Vermont Yankee nuclear facility tax proposal, rather than expressed opposition to the wind-related provisions, suggesting (as the veto was not overridden) that these provisions may be revisited in the next legislative session.

Net Metering: As electricity price increases and volatility persist across New England, energy-intensive businesses, institutions, and governmental entities are evaluating the technical and economic feasibility of self-generation. Among the threshold issues reviewed are state-specific net metering laws. Net metering allows an eligible electricity-generating facility located on the customer's side of the meter to offset the host's electricity consumption at the utility's total delivered retail rates over at least a month (in some cases, excess production can be applied against future month's consumption). Energy produced in excess of onsite consumption is sold back to the utility at wholesale electricity rates. Eligibility is defined by the kW capacity of the generator, and it sometimes varies by generation technology. The combination of revenue certainty and compensation at retail rates helps end-use consumers justify the capital expense of installing onsite generation. The following graphic depicts the differences between current (solid bar), proposed (dotted outline), and recently adopted (solid bar) net metering thresholds applied to individual projects across New England.

In addition to the per-installation limits depicted above, Rhode Island also has a system-wide cap on the amount of generation that can be net metered. The recently adopted system-wide cap is 5 MW (up from 2 MW).

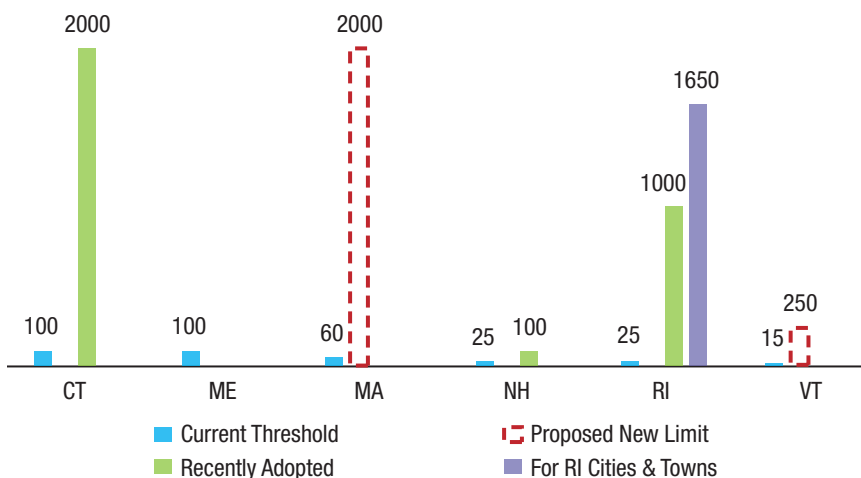


Figure 2. Comparison of current, proposed, and recently adopted net metering thresholds (kW)

Regional Wind Development Update

Maine

In Mars Hill, the 42-MW **Evergreen Wind Farm's** turbines reached commercial operation in December 2006 and January 2007, making it the largest operating wind farm in New England. The project, located on a ridge with several cell towers and a small ski area, is expected to generate approximately 130,000 MWhs per year. Although the project is located in the Northern Maine Independent System Administrator territory, most of its energy and Renewable Energy Certificates are being sold into ISO-New England territory for consumption by New England customers. A few of the nearest abutters to this project have raised complaints about sound impacts. Their concerns have been reported in the press. For a primer on sound issues associated with wind, see www.windpoweringamerica.gov/ne_issues_sound.asp.

On January 24, 2007, the Maine Land Use Regulation Commission (LURC) directed its staff to draft a recommendation to deny **Maine Mountain Power's** (MMP's) permit application for a 90-MW (30 turbines at 3 MW each) project proposed for Black Nubble Mountain and Redington Pond Range. This countered the LURC staff's December 2006 recommendation to the Commission to approve the project. In response to the primary concerns of project opponents, on May 9 MMP requested that LURC reopen the record to consider a smaller, 54-MW (18 turbine) project limited to Black Nubble Mountain. LURC granted MMP's request, and the revised proposal was filed on July 9. A hearing on the Black Nubble proposal is scheduled for September 19 through 21. MMP is the joint effort of Endless Energy of Yarmouth Maine and Edison Mission Group. Also before LURC is the **Kibby Mountain Wind Project**, proposed by TransCanada for Kibby Township in the Boundary Mountains. TransCanada filed an application with LURC for a zoning change and development permit on January 8, 2007. Public Hearings are scheduled for October 2 through 4, and a decision is expected by the end of 2007. Environmental and technical studies have been underway for more than a year. In early 2007, UPC Wind

Management announced the development of the **Stetson Ridge Wind Project**, a 57-MW facility in unorganized territory in eastern Maine. An application has been filed with LURC, requesting permit approval for 38 turbines. LURC has officially accepted the application for review and held public hearings on August 7 and 8. Wind monitoring is underway. Depending on the result and timing of LURC's review, these projects could be operational as soon as late 2008 or as late as 2010.

The **Aroostook County Wind Project** proposes the phased-in development of up to 500 MW of wind generators in several northern Maine potato farming communities. Project developers Horizon Wind Energy and Linekin Bay Energy have several meteorological towers in place and continue to monitor wind levels to determine project viability. Land lease discussions with local farmers are

underway. The study of a new transmission line to connect the project directly to ISO-NE is ongoing. Permitting is targeted to begin in 2007, with the project scheduled to be built in three phases between 2009 and 2012.

The **Passamaquoddy Tribe**, through Tribal Energy Visions LLC and Disgen Inc, is exploring the feasibility of two wind projects on tribal lands. Both projects are currently monitoring the wind resource and completing feasibility studies. The project in north-western Maine is currently planned for approximately 50 MW. The other project, on tribal land near the coast, is expected to be a one- or two-turbine installation.

Community-scale wind energy development is underway in Freedom, where local developer Competitive Energy Services has proposed the 4.5-MW **Beaver Ridge Wind Project**. Freedom residents voted in June to repeal the Commercial Development Review Ordinance that limited the project's development.

Massachusetts

The **Berkshire Wind Project** in Hancock, which has been nearly fully permitted since 2004, continues to be delayed by an ongoing dispute with neighboring landowner Silverleaf Resorts, Inc. Silverleaf, which intends to build luxury condominiums on its adjacent mountain property, has filed action in Federal District Court arguing that the turbines are an "aesthetic nuisance." In addition, Berkshire Wind is reevaluating the number, type, and location of project turbines as a result of discussions with Silverleaf after a trespassing event involving the project construction crew. Construction of turbine foundations began in 2006, and the project should be fully operational in 2008.

The **Hoosac Wind Project** (New England Wind, LLC) received its initial wetland permit from the Town of Florida Conservation Commission in May 2004. After an appeal of this permit, the Department of Environmental Protection (DEP) issued a Superseding Order of Conditions in November 2004, which was subsequently appealed. Earlier this spring, the Division of Administrative Law Appeals recommended that the permit not be issued, based on its assessment of the developer's evaluation of wildlife habitat impact, as well as issues associated with access road culverts. Nonetheless, the DEP commissioner issued a final order granting the permit to the 30-MW project despite the magistrate's administrative opinion to the contrary. The citizen group challenging the permit has now filed suit in Massachusetts Superior Court against the developer and the DEP.

Minuteman Wind, LLC continues to focus on its development of a 12.5-MW project in Savoy. The project has 3 years of wind data and has conducted numerous environmental assessments. Access roads and turbine availability remain concerns, but the key issue is zoning. Minuteman has been working with the town on a bylaw permitting wind power projects and expects town action in Q3 of 2007.



Photo-simulation superimposing the planned new two-turbine PMLD Wind Farm on the site of the historic eight-turbine Princeton wind project installed in 1984. (Photo credit: PMLD/PIX15161)

In early 2007, the Princeton Municipal Light Department (PMLD) contracted for the installation of two Fuhrländer 1500 turbines, the first of their kind to be installed in the nation. PMLD, which formerly worked in partnership with Community Energy Inc. on this project, will redevelop the site of the original Princeton wind project installed in the 1980s. The 3-MW **PMLD Wind Farm** is expected to produce approximately 40% of the town's annual electricity requirements. The town, which received final approvals for the project in July 2006, has commenced construction and expects to install the turbines in early 2008.

The 430-MW **Cape Wind Project** in Nantucket Sound has been under federal, state, and regional regulatory review since 2001. On December 18, 2006, the Massachusetts Supreme Judicial Court issued a ruling affirming the May 2005 decision of the Massachusetts Energy Facilities Siting Board to approve the construction and operation of undersea transmission lines to serve the project. However, due to the first-of-its-kind nature of this project, the review process has been characterized by procedural changes and delays. Minerals Management Service (MMS) – the federal agency responsible for reviewing offshore wind projects – has announced that the long-anticipated release of its draft Environmental Impact Statement (EIS), originally expected in early 2007, will be delayed until late summer. This is certain to delay the final EIS and final decision, which were previously expected before the end of 2007. Local regulators continue to review the project as well. On March 30, 2007, Massachusetts Secretary of the Executive Office of Environmental Affairs Ian Bowles issued a Determination of Adequacy on Cape Wind's Final Environmental Impact Report (FEIR).

A number of Massachusetts businesses and communities are actively pursuing the study and construction of one or more commercial-scale wind turbines. **Jiminy Peak Ski Resort**

became the first to integrate wind power into its energy strategy when it completed the installation of a GE 1.5-MW turbine at its Hancock facility in July 2007. The resort dedicated the turbine in a public ceremony on August 15. **Varian Semiconductor Equipment Associates** has successfully identified and retained engineering, procurement, and construction contractors to install two Fuhrländer 1500-kW turbines at their Gloucester headquarters, with construction expected to begin in late 2007 or early 2008. However, after Varian completed the necessary studies and permitting to install the project, the City of Gloucester created a new ordinance that will require Varian to obtain additional approval from the city before it can proceed. After running into complications with the FAA over a proposed 1.5-MW turbine, **Cape Cod Community College** is now evaluating the potential for a 250-kW to 750-kW installation, which could meet FAA height restrictions. The Massachusetts Technology Collaborative (MTC) completed its third round of funding under the Large Onsite Renewables Initiative (LORI). Six wind projects, totaling approximately 5.5 MW, were among 16 projects receiving design and construction grant funding. An additional 10 Massachusetts wind projects were awarded funds to conduct feasibility studies. To view the schedule and download the LORI application, please visit www.masstech.org/renewableenergy/large_renewables.htm.

A number of local community-sponsored projects are in various stages of feasibility analysis and planning for the construction of one or more wind turbines on municipal land. Most of them are participating in the Massachusetts Renewable Energy Trust Community Wind Collaborative (CWC), where MRET pairs each community with a group of technical consultants and funds technical, environmental, and economic feasibility analyses. The majority of participating municipalities are on Cape Cod. **Eastham, Falmouth, Fairhaven, Lynn, and Orleans** have completed their respective feasibility studies, including installing meteorological towers to measure the wind resource characteristics. **Eastham** is considering a four-turbine installation, although matters related to the necessity of a new municipal bylaw are likely to delay the required town meeting vote into 2008. On May 15, 2007, the **Town of Fairhaven** held a special town meeting, during which it authorized the selectmen to negotiate a land lease and otherwise proceed with selected project developer CCI Energy for the installation of two turbines (approximately 3 MW) at the wastewater treatment facility. The town also expects to negotiate a Power Purchase Agreement with the project. After an initial attempt to build a 1.5 MW turbine was turned down by the FAA due to height and radar interaction issues, the **City of Lynn** has secured FAA approval to erect a 500- to 600-kW turbine. Managers of the regional wastewater treatment facility are now examining equipment and installation contractor options. **Orleans** had hoped to complete its project during the 2006 construction season. However, issues such as the complexity of development on a watershed slowed the process. The town received its Massachusetts Environmental Protection Agency (MEPA) permits on April 20, 2007. The Orleans Renewable Energy Committee hopes to issue an RFP for assistance from a private developer by the end of August 2007. Construction bids for 2008 are likely.

Several CWC communities, including **Brewster, Kingston, Mattapoisett, Rockport, Scituate, and Old Rochester Regional High School** (Marion, Mattapoisett, and Rochester) currently have technical and economic feasibility studies under way. Many other CWC communities are monitoring their wind resource with a meteorological tower. Evaluation of a wind turbine on municipally owned land in **Harwich** was shelved due to FAA concerns. Additional information on the communities participating in the Community Wind Collaborative is available at <http://masstech.org>.

Dozens of other community-sponsored wind projects in Massachusetts are at various stages of consideration. Some are in towns with municipal electric companies that are not part of the CWC.

In addition to community-specific initiatives, the **Massachusetts Water Resources Authority** (MWRA) is investigating the possibility of siting wind turbines at Deer Island, as well as other Authority locations. MWRA staff is preparing an update for its board of directors on the potential cost and schedule of installing a wind turbine at Deer Island. MWRA has received a height-related approval from the FAA sufficient to construct an approximately 250-kW turbine on Deer Island. However, the project remains on hold pending FAA determination of the potential impact on radar (see www.windpoweringamerica.gov/ne_issues_interference.asp for more information on radar interactions). The assessment of additional sites will focus on locations where MWRA has significant continuous energy loads (e.g., Braintree-Weymouth Intermediate Pumping Facility and Nut Island Headworks), which could utilize a significant percentage of the output from onsite generation.

New Hampshire

The New Hampshire Energy Facilities Siting Board has completed a 1-year review of the **Lempster Windfarm** in Lempster and has granted the project the last of its required state approvals. Project owner Iberdrola hopes to begin construction before the end of summer 2007 and expects the project to come on line sometime in 2008. In New Hampshire's northern Coos County, Noble Environmental Power recently announced up to 250 MW of prospective projects under study, including the **Odell Windpark**, which could host approximately 100 MW in Odell Township. This project is currently collecting wind data.

Rhode Island

After receiving one of New England's few Clean Renewable Energy Bonds (CREBs) awards from the U.S. Treasury's first-round allocation, the **Town of Portsmouth** is conducting a detailed feasibility study of one or more megawatt-scale installations at its middle and/or high schools. The study is expected to take place during summer 2007. The funds associated with the town's CREBs award must be consumed within 5 years. The Narragansett Bay Commission – another CREBs award winner – is proceeding with the technical evaluation of a single megawatt-scale turbine.

Vermont

On August 8, the Vermont Public Service Board granted UPC Wind's 40-MW **Sheffield Wind Project** a Certificate of Public Good. This project, consisting of 16 of Clipper Wind's 2.5-MW Liberty turbines, had been reduced from 52 MW in response to feedback from the local community and state agencies. UPC Wind worked with the Agency of Natural Resources to address potential issues with birds and bats; UPC Wind has already completed several studies and has committed to operating the project in a manner that should further reduce potential impacts to birds and bats. In addition, 2,700 acres surrounding the project will be conserved as bear habitat. The project is targeting operation in 2008. At the request of the Public Service Board, the **Deerfield Wind Energy Project** – an expansion of the existing Searsburg Wind Farm – has resubmitted its proposal to the board. This project, located in the Green Mountain National Forest, has been developed through an extensive collaborative process. Project developer PPM Energy, recently purchased by Iberdrola, has submitted a Special Use Application to the U.S. Forest Service. The permitting process is expected to continue through 2008. The project's targeted online date is late in 2009. In January 2007, Noble Environmental Power announced plans to develop 50 MW near **Grandpa's Knob**, on the border between West Rutland and Castleton. Still in the early stages of project exploration, Noble is negotiating with local landowners for control of the proposed site and plans to begin measuring the wind resource later in 2007. Noble has applied to the Public Service Board to install meteorological towers to measure the wind resource. The application is pending at this time.

Connecticut

Exeter Energy LP continues to collect wind data and evaluate the feasibility of building up to 50 megawatts adjacent to the Sterling industrial park it currently occupies. A meteorological tower was erected in August 2006 to collect wind data. Exeter Energy may lease up to 73 acres from the Town of Sterling and hopes to site 25 to 35 turbines. Permitting and operation timeframes have not yet been released.

Perspectives: Andrew Dzykewicz, Commissioner, Rhode Island Office of Energy Resources

Our smallest state, Rhode Island has few native energy sources and high energy prices. After its legislature passed an aggressive renewable energy standard, Governor Carcieri established the RIWINDS program, with its goal of meeting 15% of the state's electricity demand with wind energy from within the state. As the Governor's energy right-hand man, Andy Dzykewicz has taken the helm of the newly formed Office of Energy Resources as the primary architect of this vision, recently rechristened RI Energy Independence 1 to reflect the mission behind the goal. With roots in the Rhode Island Economic Development Corporation and the Quonset Point industrial park, where he developed the park's power plant, Andy is applying his 40 years of experience in energy engineering, economics, and development to reshaping Rhode Island's energy landscape.

The full text of this interview can be found at www.windpoweringamerica.gov/ne_interviews.asp.

Q. RI Energy Independence 1 is a departure from historic wind energy development efforts in the region. How was the concept developed, and what was its motivation?

The concept was born out of the Governor's desire to harness renewable energy to meet a significant portion of the state's needs. There are a number of motivations: price stability, energy independence, economic development, and environment. We realize our coastal location gives us a great wind resource, allowing us to establish a goal of getting 15% of the state's electricity demand from local wind energy. But we've seen how the typical developer approach – finding a single site and forging ahead even in the face of stiff resistance – has yielded limited success in New England. So we opted for a radical departure: the public sector, through the RI Energy Independence program, will identify a number of feasible sites and then proceed with the locations that are consensus driven and therefore most likely to succeed. We also recognize the economic development potential from this type of development: jobs to build projects, but also luring companies in the wind energy field to locate and expand within the state. We also expect increased electric price stability to help make Rhode Island more attractive to current and future businesses.

Q. What barriers does this program seek to overcome? How does this approach deal with these barriers differently than the traditional development approach?

The two biggest barriers we've seen in New England are identification and approval of project sites that are acceptable to local residents, environmental stakeholders, and project owners, and attracting financing in our restructured electricity market where few credit-worthy buyers are willing to enter the kind of long-term contracts that capital-intensive wind generators need to be cost-competitive. We've also seen that when projects are built, often the local ratepayers have not received the benefits.

This program attempts to reduce and address the siting challenges by building consensus around a few sites that meet societal goals, rather than linking the entire program's success to a single location regardless of its local acceptance. Credit-worthy entities offering contracts of 15 years or longer can reduce developer risk substantially, lowering the cost of energy and increasing the likelihood of completing a project.

Q. How do current bills to establish a Rhode Island Power Authority fit in?

A proposed power authority is envisioned to fill the gap where the market is currently not working for large-scale development by enabling long-term contracting and financing. Both the House and Senate are considering bills to establish a Rhode Island Power Authority. The bills would accomplish four things. First, they would establish a Power Authority and governance structure – including Board of Directors. Second, the Authority would have the ability to enter long-term contracts. Third, the Authority would have the ability to issue long-term bonds to finance power-generating projects. These would be strictly revenue bonds, not general obligation bonds, so each project investment is to be

evaluated and stand on its own. Lastly, the bills would consolidate all of Rhode Island's funds for renewable energy development to a single agency. This would put under one roof the Renewable Energy Fund, the Renewable Energy Development Fund, as well as Funds from auction of Regional Greenhouse Gas Initiative (RGGI) allowance allocations, emissions offsets, and FCM payments.

Because the power authority would have the ability both to issue bonds and to enter long-term contracts, it would be able to capture wind generated electricity at fixed prices that are based on long-term project financing costs and not on expected long-term electricity market price trends. Of course, any eventual power authority would be only one of several ownership and financing options present in the market. The state would seek to capitalize on its abilities but would expect ample additional competition in the market.

Editors' note: shortly before press time, the proposed Power Authority Bill was not passed by the legislature; the impact on the overall plan is yet to be determined.

Q. What did the results of the preliminary RI Winds study reveal about the ability of the plan to meet 15% of the state's electric load from in-state wind? What needs to happen to meet this goal?

The Phase 1 Siting Study revealed that Rhode Island has five times as much feasibly developable wind resource area, between onshore and offshore locations, than needed to meet our goals. To meet a 15% target, most of the wind development would need to be offshore because of the state's limited available land and because the winds are much better offshore. There are advantages to being a small state in meeting such an aggressive target. With an annual average state load of approximately 1000 MW, we need about 150 average MW – corresponding to roughly 450 MW of wind turbine capacity – a more feasible target than if we had a larger load.

The study identified no permitting “show stoppers” among the selected locations. This means we have a stable of viable sites for local stakeholders to choose from. Of course, we understand that there will be important issues to discuss and investigate further, but at this time no obvious permitting barriers have come to our attention.

Q. How will Rhode Island address the topics that have delayed offshore wind development in Massachusetts?

In the typical approach, where a developer advances only one potential site, the tendency is to focus on the perceived ills of that site. Instead, we offer interested stakeholders the opportunity to play a significant role in narrowing the considered locations. We only need to come to agreement on selecting the best 20% of most acceptable sites to meet our target. Along the same lines, the possibility of having a state-run power authority own the facility and/or purchase all of the output opens the door to create wind generation that is developed by, owned by, and creates benefits for Rhode Island consumers. This represents a dramatic departure from our current experience with wind energy, where the public perceives that most of the benefits are privatized.

Q. How has the Rhode Island public responded?

All of the feedback to date has been positive. The program objectives and Phase 1 results have been discussed publicly and are well received; there have been no adverse reactions. Of course, that may be because we haven't picked a site yet. As we narrow the process of considering specific sites, we anticipate more questions or concerns. But that's what the stakeholder process is about, to identify the problematic sites early and recommend a group of sites that are most likely to be successfully developed. Of course, it's possible that no material resistance will develop, but based on my experience, that seems unlikely. Based on feedback so far, we remain cautiously optimistic that our stakeholder process and the overall approach will produce a broad consensus on sufficient sites to meet our targets.

Q. What do you see as the role of government versus the private sector in achieving these goals?

The role of government is to address the barriers faced by the private sector. At the same time, Rhode Island wants title to the output to capture the long-term price benefits of these projects. The open question is how best to achieve private investment and public benefit. If the state is investing its natural resources, we need to receive the benefits locally. To capture the price and price stability benefits we believe we can achieve, we want the electricity produced to be sold to the state's retail load-serving entities – the utilities and non-regulated power providers – rather than into the regional electricity market. We can ensure this through ownership, or through contract.

If the power authority is set up, it could seek proposals to either design, build, and operate state-owned generation projects, or instead seek proposals to design, build, finance, and operate privately owned wind generators. The power authority would enter a long-term contract for the plant's output with the selected entity, making payment sufficient for the development cost and a fair profit. The power authority would then offer to sell the power to Rhode Island's retail load-serving entities, and sell any excess to the regional grid. If this can work at today's market electricity prices, it will only be more competitive as time goes on.

Q. Where does this effort go from here? What is the process to pare down the sites identified in the RI Winds study?

The next step is to assemble a local stakeholder group. We've identified about three dozen individuals and organizations that we believe would make valuable contributions, some of which have already asked to be included. To be successful, the entire process will have to be open; to do otherwise would defeat the purpose of having a stakeholder process. We envision that such a group could begin meeting this summer (2007), and continue as long as it takes, with the help of a professional facilitator who we'll hire to help organize and run the process. In the end, we envision the product of this working group to be a consensus document expressing the stakeholders' opinions and objectives, which would be included as part of an RFP for selected sites. We're not planning another study... that effort was systematically and thoroughly completed in Phase 1. The time for study is over, the time to start developing our energy independence is now, once we decide where.

Q. Now that a number of potentially viable project locations have been identified, what plans do you have to help facilitate the permitting process?

The most significant contributor to successful permitting will be the consensus opinion of the stakeholder group because if it proceeds as hoped, the wide range of stakeholders with vested interests will be on board. Most of the sites are within state water, so permitting can be simpler, involving fewer agencies, permits, stakeholders, and issues than projects in Federal waters. The proposed power authority bill could also contribute to the permitting process by including a provision to grant expedited permit review - but not relief from permitting requirements - to projects of the power authority. In this case, any state agency would need to treat an application related to the power authority in an expedited fashion. By placing the state, through the power authority or otherwise, in the role of permit applicant, it sends a clear signal that the project is something that the state wants to see to successful completion.

Q. When do you expect the first projects to come on line?

This all takes time. Optimistically, we're looking 5 years out, but more realistically, perhaps 7 years. We want to be successful, and we want to do it right. If it takes longer than that, I'd question whether it would ever get done. This presumes, for larger off shore projects, about a year to conduct the stakeholder process, circulate an RFP and qualify one or more vendors. From there, estimate 2 years for development, including state permitting (and federal, if necessary), and 2 years from beginning of construction until full commercial operation. To the extent that several smaller onshore sites are identified and financially viable, these may be developed on a shorter timeline. I don't envision a request for proposals process for on-shore, which would move along separate tracks.

Q. Will communities have both hosting and ownership opportunities?

Yes. In some cases community hosting and ownership will make sense. In other cases it will not. In general, we encourage communities to pursue small (one- and two-turbine) installations where they are economically viable, and we will assist those that are viable in any way we can. Another avenue that may make more sense is for communities to aggregate their power purchase requirements and financially support the construction of a single, larger project. This will enable scale economies to be reflected in both the project capital cost and the power price. Longer-term contracts for power can help drive down prices, and a community's credit behind a purchase from the power authority could leverage the ability for the power authority to secure a strong bond rating to borrow at low interest rates. Each of these has the potential to benefit the community, depending on its role.

Q. How can you ensure that some of the price-stability benefit of wind energy will accrue to Rhode Island consumers?

As a fuel-free resource, wind generators can offer fixed-price energy over long term. But if all of the output is sold to the grid, then both Rhode Island and New England would benefit from spot market price suppression, but because Rhode Island is only 6% of the regional load, the benefits would be highly diluted. Price stability benefits go hand in hand with ownership or long-term contracts. If a community builds a project to consume the power itself, it will have fixed the price of that energy for more than 20 years. If the power authority enters long-term contracts, then Rhode Island communities will get first crack at 100% of the price stability benefits. Given the significant Renewable Energy Standard demand, as well as the potential value of having long-term fixed price supply in the portfolio, we hope that much of this wind power can be sold to National Grid for the remaining standard offer customers. In that case, the price stability benefit would certainly be conveyed through regulated retail rates.

Technical Challenges

Sound

One of the concerns of project abutters is the potential impact of wind turbine sound. Because this issue has been raised, we've added a primer on the sound impacts of wind energy on the NEWF Web site at www.windpoweringamerica.gov/ne_issues_sound.asp.

Radar

Wind turbines, like all structures, can create interference with military and navigational radar. The Department of Defense

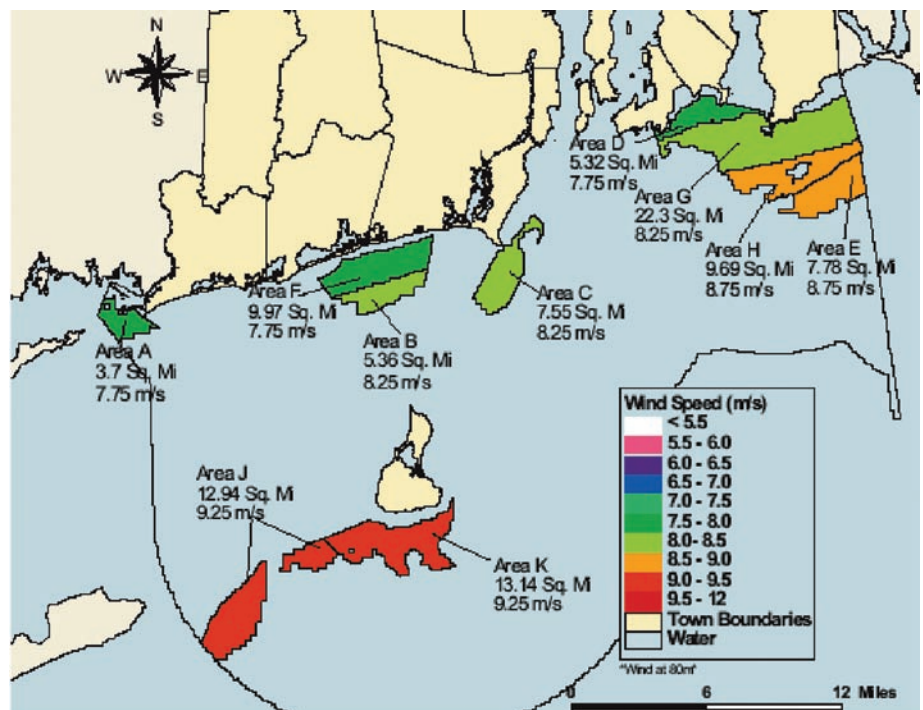


Figure 3. Map showing Rhode Island offshore Post Level 2 screening areas by wind speed (source: RI Winds Phase I Wind Energy Siting Study, fig. 3-20)

(DOD) recently announced that for a 25-kilometer radius around its PAVE PAWS radar installation on Cape Cod, there is a potential for wind turbine interference. DOD will require further study to assess wind turbine impact within this radius. Although the Cape Wind project falls just outside of this zone, several community-scale projects may be affected until site-specific impact and mitigation options can be studied. DOD has already concluded that the Town of Hull's planned offshore wind installation will not interfere with the PAVE PAWS radar. Radar interference and mitigation have received increasing attention over the past year. NEWF has created a new Web page to track this issue at www.windpoweringamerica.gov/ne_issues_interference.asp. The DOE Wind Program has developed a Web site on radar and other wind siting issues, which can be viewed at www.eere.energy.gov/windandhydro/federalwindsiting/

Transmission and Grid Integration

National Grid USA, one of the region's largest transmission utilities, has issued **Transmission and Wind Energy: Capturing the Prevailing Winds for the Benefit of Customer**, a report that examines wind-related transmission policies and makes recommendations for effective integration of wind generators into the U.S. electric system. You can find the report at www.dleg.state.mi.us/mpsc/electric/capacity/energyplan/renewables/c3-3_NG_wind_policy.pdf.

Small Wind Corner

Net metering limits are on the rise across New England, creating new and better opportunities for small wind (see page 4 for more information).

Federal Investment Tax Credit Bill Gains Momentum

In Washington, the House and Senate are considering identical bills that would establish an up-front investment tax credit for the purchase of small wind systems for homes, businesses, and farms. The bill proposes a federal tax credit of \$1,500 per ½ kW of installed capacity. The proposed credit would have no cap and would be available for 5 years for all wind systems rated equal to or less than 100 kW in capacity. In addition, the bill would allow the tax credit to carry over. In the event that using this credit puts the consumer's taxable income below the minimum threshold, the carry-over provision allows the unusable excess credit to be carried over to the next tax year. This essentially allows a consumer with a low annual income to take full advantage of the credit. Finally, the proposal includes accelerated depreciation of 3 years for small wind systems owned by commercial entities, rather than a standard 5 years.

Vermont Company to Develop Home Wind Turbines

In 2005, one of the founders of Vermont-based NRG Systems established a new venture, EarthTurbines (www.earthturbines.com), to develop and manufacture home-scale wind turbines. The company, based in Hinesburg, Vermont, is currently in the testing phase with a 2.5-kW turbine.

Multi-Family Residential Housing Complex to Evaluate Feasibility of Onsite Wind

The Massachusetts Technology Collaborative, through its Large Onsite Renewables Initiative (LORI) program, has awarded Harbor Point Apartments (a multi-family, mixed income, residential complex near UMass Boston) with a \$40,000 grant to evaluate the potential for onsite wind power using multiple freestanding micro turbines. Turbine sizes and designs from several manufacturers will be evaluated over approximately 5 months. Harbor Point consists of nearly 1300 apartments that house nearly 3000 residents. The feasibility analysis began in June 2007 and is expected to be completed by November 2007.

Hot Topics

Big Vision and Steady Sea Breeze Take Small Town Offshore

While large, high-profile offshore wind farm plans in the waters off of New York, Delaware, and Massachusetts labor forward, the small town of Hull, Massachusetts continues to make tangible progress towards its goal of completing what could be the first offshore wind installation in the United States. In early 2007, the Massachusetts Technology Collaborative agreed to provide Hull with up to \$1.7 million in low-interest loan support for the project's environmental and engineering studies – including geotechnical evaluations, wind and wave measurements, and the pursuit of necessary permits. As of August 2007, these studies are well underway. Hull met in mid-July with the U.S. Army Corps of Engineers to discuss the project and expects to file its Expanded Environmental Notification Form by the end of 2007. With a likely capacity of between 12 and 14 MW, the Hull project is far smaller than the other proposals. Nonetheless, the town must face many of the same unknowns associated with siting, permitting, installing, and operating the nation's first offshore wind turbines. The *Perspectives* interview from the last NEWF newsletter features a conversation with project proponent John MacLeod, detailing the process by which Hull completed its first two wind turbine projects and the town's interest in going offshore. You can download previous editions and sign up for the newsletter at www.windpoweringamerica.gov/ne_signup.asp

Wind Energy Serves as a Hedge Against Short-Term Volatility and Long-Term Price Trends

In late May, in an effort to stabilize the school's electricity prices, Southern New Hampshire University announced the successful negotiation of a 15-year wind hedge contract with PPM Energy. The contract-for-differences style hedge for 15 million kWhs per year will be based on production from PPM's Maple Ridge Wind Farm in Lowville, New York. The Renewable Energy Certificates (RECs) will come from one of PPM's West Coast wind projects. The combined cost of energy and RECs is fixed at 7.6 cents per kWh for the duration of the 15-year contract. On July 19, the University hosted a seminar titled *Developing Renewable Energy Hedge Contracts between Energy Users and Renewable Energy Developers*. During the workshop, which was open to all interested parties, representatives from PPM and the University intro-



Photo Simulation of Hull Offshore Wind Power Project

Key

About the Project:
 Owner: Hull Municipal Light Plant
 Project site: Harding Ledge
 Turbine: 4 Vestas V90's
 Diameter: 295 feet (90 m)
 Hub height: 262 feet (80 m)
 Location: 42°18'16.2" N, 70°50'50.5" W

About the Photo:
 Viewpoint: 4 Oceanside Drive
 Distance to turbine: ~2.5 miles
 Angle of View: ~38 degrees
 Location: 42.26803°N 70.84785°W
 Base Photo: Taken Dec. 20, 2006, #44
 Apparent size and location of the turbine from this viewpoint is determined geometrically using EMD WindPro software.

Renewable Energy Research Laboratory
 Dept. of Mechanical & Industrial Engineering
 University of Massachusetts
 160 Governor's Drive
 Amherst, MA 01003-9265
 413-545-4359
www.ceere.org/rerl
rerl@rerl.org



Photo simulation of proposed Hull Offshore Wind Power Project (Source: UMass Renewable Energy Research Lab/PIX15162)

duced the concept of a financial hedge, discussed how to size a hedge and estimate its effectiveness at controlling electricity costs, and reviewed the hedge transaction from each party's perspective, including legal and accounting impacts.

NStar Announces Wind Power Option

On August 1, NStar Electric Company filed for approval with the Massachusetts Department of Public Utilities of an option for the Boston utility's 1.1 million residential and small commercial customers to purchase wind power equivalent to 50% to 100% of their monthly consumption, as well as for two wind power contracts. The program, which NStar hopes will be available by January 2008, is backed by 10-year, 30-MW contracts with the Maple Ridge wind farm (jointly developed by Horizon and PPM Energy, which is now owned by Iberdrola) currently operating in New York, and the Kibby Mountain wind farm being developed

in Maine by TransCanada (expected online during 2009). Because this program represents a departure from the current market structure and the role of regulated utilities in the state, it requires approval by the DPU in Docket DPU 07-64.

National Research Council Releases Wind Study

The National Research Council – whose members are drawn from the National Academy of Sciences, the National Academy of Engineers, and the Institute of Medicine – recently released *Environmental Impacts of Wind Energy Projects*, a report that provides analyses to help evaluate positive and negative environmental effects of wind energy facilities. The report outlines the state of knowledge and provides recommendations for future research regarding the environmental impacts of wind energy. This report is not a comparative study and does not compare wind's environmental impacts to those of other energy generation

facilities and does not consider the benefits created by wind's displacement of fossil fuel generation. The report is available at http://books.nap.edu/catalog.php?record_id=11935.

Blade Test Facility to Be Built in Boston

The Commonwealth of Massachusetts Partnership and the Lone Star Wind Alliance in Texas received grants from the U.S. Department of Energy to build large-wind-turbine-blade testing facilities. Both facilities will be on the waterfront to facilitate transport of large blades up to 70 meters in length. Massachusetts plans to build its facility in Charlestown on the Boston Autoport, a part of Boston Harbor with easy access to truck, rail, and ship access. The testing facility will be built in 2008 and operational in 2009.

Wind Creates Jobs and Economic Development

A recent National Renewable Energy Laboratory presentation highlights the economic development impacts of wind energy (www.windpoweringamerica.gov/pdfs/wpa/econ_dev.pdf). This impact is evident within New England as the number of wind industry employers grows. New England is home to many wind power development companies, including early entrants Endless Energy Corp. (Maine) and Catamount Energy Corp. (Vermont) and companies that have shifted their focus from developing fossil-fuel generators, like Cape Wind developer Energy Management, Inc. (Massachusetts).

New wind project developers also call New England home. These include UPC Wind Management (Massachusetts), Noble Environmental Power (Connecticut), Jay Cashman subsidiary Patriot Renewables (Massachusetts), Minuteman Wind (Massachusetts), ENEL North America (Massachusetts), and Tamarack Energy (Connecticut). The region is also home to wind turbine equipment manufacturers Distributed Energy Systems (Connecticut and Vermont) and Earth Turbines (Vermont) and blade manufacturer TPI Composites, Inc. (Rhode Island). Two of the foremost manufacturers of wind measurement equipment are Second Wind (Massachusetts) and NRG Systems (Vermont). In addition, service-sector firms abound, with growing wind energy practices supporting regional and national wind development efforts in fields including engineering, environmental, consulting, finance, and law.

Wind Stats

Wind development activities in New England range from a small number of operating plants in Maine, Vermont, Massachusetts, and Rhode Island to additional facilities under construction and a much larger "development pipeline" spanning all six states. Figure 4 provides an overview of the region's wind development status.

Events

The New England Wind Forum Web site maintains an up-to-date calendar of wind-related events, from conferences and workshops to siting hearings, in all six New England states. Check the calendar frequently for the latest opportunities to attend industry and community forums and be involved in the wind energy dialogue.

The calendar is available at www.windpoweringamerica.gov/ne_calendar.asp

Cool Links

In each issue, we'll feature links to a few cool Web sites. Additional links will be added to the New England Wind Forum Web site.

- **Slide show of wind farm construction:** The Bangor Daily News web site has a slide show featuring the construction of the 42-MW wind farm in Mars Hill in northern Maine: <http://bangordailynews.com/news/t/slideshow.aspx?articleid=143176&zoneid=580>
- **Presentations from From Local to Global:** The Rhode Island Model for Harnessing Wind Power WorldWide: This conference, held on April 19-20 at the University of Rhode Island, focused on the context and the financial and business models for developing a substantial portion of Rhode Island's energy supply from wind power. It featured the presentation of RI Winds Study results and status reports from 11 community-scale wind development efforts. Presentations from this conference can be found at www.windri.org/conference/content.html.

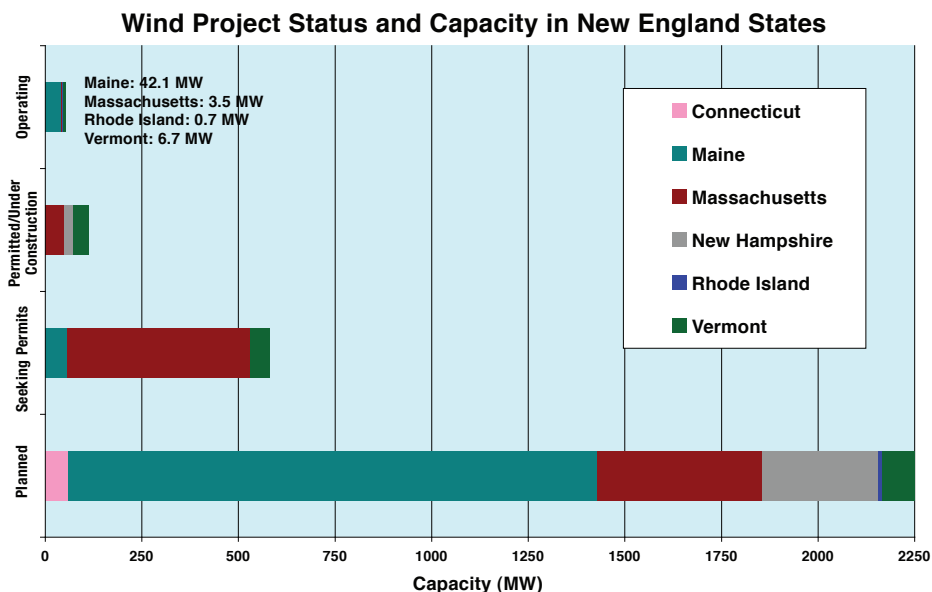


Figure 4: Status and capacity of New England wind projects by state (Source: Sustainable Energy Advantage, LLC)

What's Next from the New England Wind Forum?

Over the next several months, a broad range of new content will be added to the New England Wind Forum Web site. The Web site and subsequent newsletters will provide the most detailed, objective information available on the important topics pertaining to wind energy in New England. Some of the new features will include:

- The impact of wind's intermittence on reliability, the degree to which backup generation is needed, and the impact and cost of integrating wind into electric systems
- Fossil fuel and emissions displacement
- An update on wind power economics in New England
- The latest on wind's impacts on birds, bats, and other wildlife
- Wind power's impacts on property values.

New England Wind Forum Made Possible by New Co-Sponsors

The New England Wind Forum welcomes and appreciates the support of the Massachusetts Technology Collaborative's Renewable Energy Trust, the State of New Hampshire Office of Energy & Planning, the Maine State Energy Program, and the Connecticut Clean Energy Fund. Together with funding from the U.S. Department of Energy's Wind Powering America Program, these new sponsors are helping to develop NEWF into a comprehensive source of objective information on wind energy matters throughout New England.

New England Wind Forum — The Newsletter

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Editor: Robert C. Grace

Authors: Robert C. Grace and Jason Gifford

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Send news ideas, events, notices, and updates to Jason Gifford at jgifford@seadvantage.com



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1-877-EERE-INF (1-877-337-3463)
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