Wind Power in Vermont: A Two Year Evaluation

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Introduction

In the summer of 2006 the Vermont Energy Partnership released an issue brief titled, "Wind Power in Vermont: A Primer." The piece highlighted key facts on wind power and showcased the benefits and challenges of harnessing wind to generate electricity.

The Partnership continues to support the inclusion of wind power in Vermont's electric portfolio. As an in-state source of power it helps diversify Vermont's energy mix and creates greater stability and reliability for the power system. Although wind is an intermittent power source, as output depends on wind strength, it can supplement Vermont's larger, base-load, 24/7 power sources, Vermont Yankee and Hydro-Québec.

Although the use of wind power increased remarkably in the United States in 2007—expanding the "nation's total wind power generating capacity by 45 percent in a single calendar year"[1]— in Vermont the story has been quite different.

By 2006 six wind power projects had been proposed. To date, no wind project has come online, yet there have been tentative advancements and many changes. Of the six projects, one was rejected by the Vermont Public Service Board (PSB), one has been halted and one has received conditional PSB approval. The remaining three are at various stages of development.

However, the debate about the most viable sources for Vermont's electricity portfolio continues today.

The brief acts as a supplement to the original 2006 publication and provides a status report on Vermont's wind projects. The 2006 brief is available on the Partnership's website, www.vtep.org .

[1] American Wind Energy Association, "Wind Energy Basics." http://www.awea.org/pubs/factsheets/2008_Market_Update.pdf

Wind Power in the U.S. – Outlook & Overview

According to the American Wind Energy Association 2007 was a record breaking year for the wind industry in the United States. "Shattering all its previous records, the U.S. wind energy industry installed 5,244 megawatts (MW) in 2007, expanding the nation's total wind power generating capacity by 45 percent in a single calendar year and injecting an investment of over $9 billion into the economy."[2]

Of all the new generation added to the U.S. electricity portfolio in 2007, wind accounted for more than 30 percent, which placed its growth second only to natural gas.[3] Although the amount of wind power did increase dramatically, wind still meets just slightly more than 1 percent of total U.S. electricity supply.

By all accounts it appears that the development of wind power will only continue to grow. In a report by the U.S. Department of Energy (DOE) released in May, 2008 the Department concluded that wind could meet up to 20 percent of the nation's electricity demand by 2030.[4]

The region with the greatest potential for development stretches from North Dakota to Texas,[5] and Texas oil tycoon and billionaire T. Boone Pickens intends to be a part of the wind movement, recently announcing a $10 billion venture for a 4,000 MW wind farm in Texas, which would be the largest in the world.[6]

While the U.S. continues to expand its wind power generation, Germany is the global leader with an installed generation capacity of 20,000 MW,[7] accounting for seven percent of its total electricity supply.[8]

If wind is to meet 20 percent of America's electricity demands a number of improvements and significant financial investments are critical. Mr. Pickens estimates that the cost of building wind farms from North Dakota to Texas to be in the $1 trillion range, with another $200 billion necessary for transmission improvements.[9]

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[2] American Wind Energy Association, "Wind Energy Basics." http://www.awea.org/pubs/factsheets/2008_Market_Update.pdf

[3] U.S. Department of Energy, Press Release, "Wind Energy Could Produce 20 Percent of U.S. Electricity By 2030," May 12, 2008. http://www.energy.gov/news/6253.htm

[4] Ibid.

[5] Pickens Plan, "The Plan." http://www.pickensplan.com/theplan/

[6] McConville, Christine, "Pickens Stuns with Attack on 'Oil Addiction.'" Boston Herald, July 15, 2008. http://news.bostonherald.com/business/general/view/2008_07_15_Pickens_stuns_with_attack_on_oil_%E2%80%98addiction_/srvc=home&position=also

[7] American Wind Energy Association, "Top 20 States with Wind Energy Resource Potential." http://www.awea.org/pubs/factsheets/Top_20_States.pdf

[8] American Wind Energy Association, "Wind Power – Clean and Reliable." http://www.awea.org/utility/pdf/Wind_and_Reliability_Factsheet.pdf

[9] Pickens Plan, "The Plan." http://www.pickensplan.com/theplan/

In its report, the DOE outlined necessary steps to increase the role of wind power to 20 percent including: enhancing transmission infrastructure; streamlining siting and permitting regimes; improving reliability and operability of wind systems, and increasing manufacturing capacity.[10]

Some states have already taking action. Recently Texas regulators approved a major transmission project that would ease many of the current system constraints that hinder the development of additional wind capacity. The project will cost an estimated $5 billion and help transport electricity from remote turbines to major cities such as Dallas, San Antonio, Houston and Austin.

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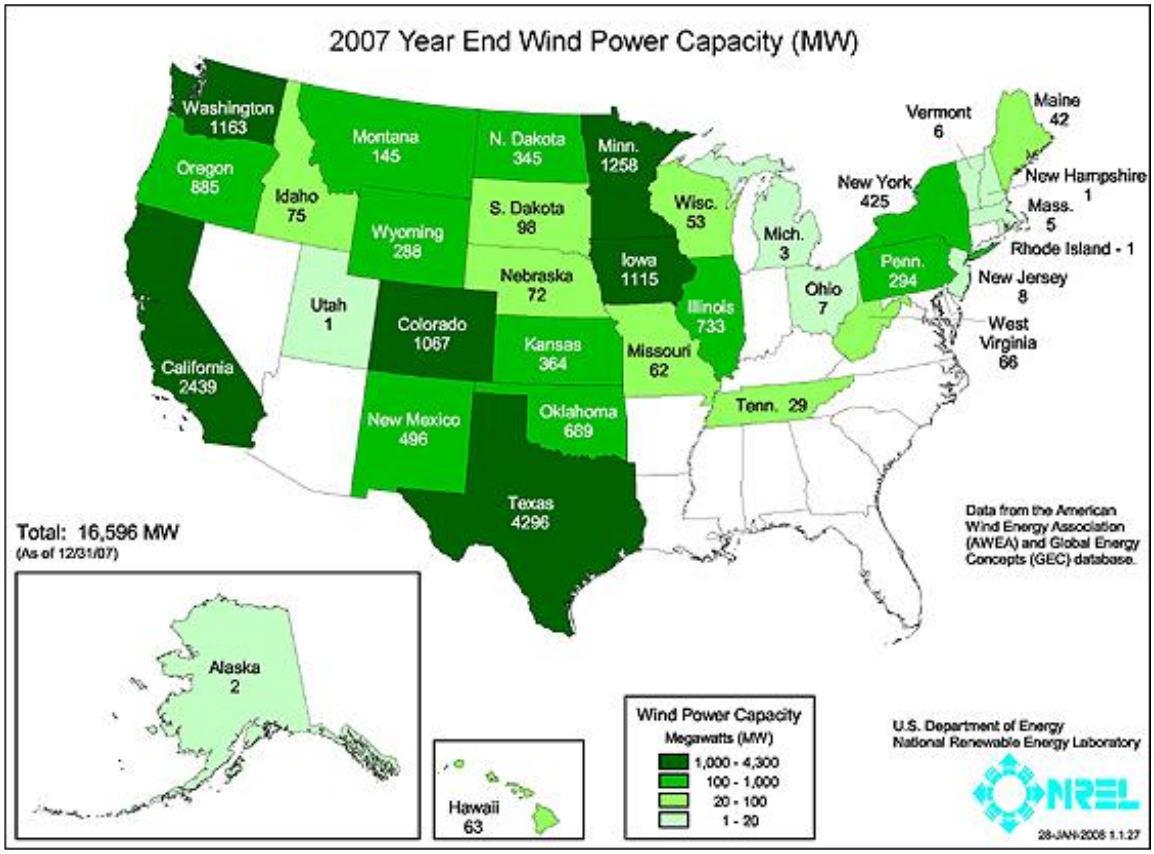

[10] Pickens Plan, "The Plan." http://www.pickensplan.com/theplan/

[11] U.S. Department of Energy - Energy Efficiency and Renewable Energy. " Installed U.S. Wind Capacity and Wind Project Locations."
http://www.eere.energy.gov/windandhydro/windpoweringamerica/wind_installed_capacity.asp#history

Wind Power in Vermont

While the push for wind across the U.S. continues, here in Vermont the story is different. Since 2006, when the Partnership published the first edition of the wind issue brief, Vermont has not brought online a single megawatt of wind power, despite having six projects in the works since 2006.

A 2005 study by the Vermont Department of Public Service determined that there was about 7,000 MW of wind power potential in Vermont. However, much of this potential exists on state or federal land which has deed restrictions that limit development.[12] This reduces the potential for the development of wind in Vermont significantly, and many experts believe that wind could only meet about 10 percent of Vermont's total electricity supply.[13]

To date, the PSB has rejected East Haven, a four-turbine wind project, and has given conditional approval to UPC Sheffield for 26 turbines. The permitting process remains lengthy and opposition from local, well-organized groups is fierce. These factors add to the financial burden for developers and investors and make building wind power in Vermont more difficult, especially compared to other states where the permitting process is more streamlined.

It is uncertain whether wind will play a role in Vermont's future energy portfolio. Unfortunately, Vermont has few in-state options for power generation, and it has been over 20 years since any significant new power source was brought on-line. Looking ahead Vermont will need to make some difficult decisions about how much of its electricity supply should come from out-of-state sources. By avoiding the development of in-state sources Vermont leaves itself would be at the mercy of the market.

Vermont Wind Projects

The following section provides an update on Vermont wind projects and describes their status and specifications.

- **Sheffield Wind Farm**

To date, the Sheffield Wind Farm has been the only project to receive approval from the PSB. In August, 2007 UPC Vermont Wind was granted a Certificate of Public Good (CPG); however an appeal was filed by the Ridge Protectors, a local opposition group. The appeal is still pending, but UPC Vermont Wind expects to break ground in 2009.

The UPC wind farm would be located on Hard Scrabble Mountain in Sheffield, Vermont and consist of 16 turbines producing 2.5 MW of power each, for a total rating of about 40 MW.[16]

[12] Department of Public Service, "Vermont Comprehensive Energy Plan 2009 – DRAFT," May 2008.
[13] Martha Staskus, Speech at the Vermont Energy Partnership's Issue Forum, November 2005.

- **Deerfield Wind Project/Searsburg Expansion**

On January 8, 2007 a petition for a CPG was filed with the PSB for the Deerfield Wind Project, an expansion in the area of the Searsburg wind farm, the only commercial wind farm in Vermont. The proposed project would add 15 to 24 wind turbines generating 1.5 – 3.0 MW of electricity each with a total rating of up to 45 MW.[14]

Besides the CPG, an Environmental Impact Statement is being prepared by the U.S. Forest Service because the proposed site is located on federal lands and requires a special permit of authorization.

Both decisions are expected by the fall of 2008, and the project is expected to be online in 2009.[15]

- **East Haven Wind Farm – Rejected by PSB**

On July 17, 2006 the East Haven Wind Farm was denied a CPG from the PSB on the grounds that impact studies on bird and bat populations were insufficient, effectively halting the project. The wind farm would have consisted of four, 329 foot tall turbines on the summit ridge of East Mountain in East Haven, Vermont. Each turbine would have produced 1.5 MW of power for a total contribution of six MW.[16]

- **Equinox Wind Farm**

This five-turbine project would be located near Manchester, Vermont on Little Equinox Mountain. Each turbine would produce 1.8 MW of power, accounting for a rated output of nine MW. The project is currently seeking permits.[17]

- **Lowell Wind Project**

The Lowell Wind project could include 12 to 26 wind turbines. Each turbine would produce 1.5 MW of power or more, and the combined output would be between 18 and 39 MW, enough to power approximately 13,000 homes. Data collection and analysis are currently underway.[18]

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[14] State of Vermont Public Service Board, "PETITION FOR A CERTIFICATE OF PUBLIC GOOD PURSUANT TO 30 V.S.A. § 248(a)," p. 3. http://www.state.vt.us/psb/document/7250Deerfield/Petition+SupportDocs/248_Petition_1-08-07.pdf

[15] National Renewable Energy Laboratory, "New England Wind Forum," Wind Powering America Program. Vol. 1 Issue 8 – May 2008 p. 8. http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/new_england/2008/newf_newsletter_issue4.pdf

[16] East Haven Wind Farm. http://www.easthavenwindfarm.com/

[17] U.S. Department of Energy, Energy Efficiency and Renewable Energy, "New England Wind Forum." http://www.eere.energy.gov/windandhydro/windpoweringamerica/ne_project_detail.asp?id=14.

[18] NRG Systems, "Wind in Vermont." http://www.nrgsystems.com/AboutWind/WindinVermont.aspx

Conclusion

While wind power is a popular and growing source of electricity generation in the United States, as with many power sources, it continues to face regulatory obstacles and local opposition. And while there is clear potential for an expansion of wind in the State of Vermont, even fully developed, wind can only meet a fraction of the state's electricity needs. To ensure that Vermont has a dependable supply of clean and low-cost electricity, base load providers such as Vermont Yankee and Hydro-Québec must continue to serve our state into the future. By building off our state's foundation of clean and reliable electricity, Vermont can lead the way toward the development of an energy portfolio that is a national standard.