

## **Was Vermont's Lowell Mountain Wind Facility a Good Idea?, by Willem Post, 14 July, 2011**

The Green Mountain Power-proposed 63 MW Lowell Mountain wind turbine facility with (21) 3 MW Danish wind turbines stretched along 4 miles of ridge lines has nothing to do with community-scale wind, everything with utility-scale wind. GMP is using blatant PR to soft-soap/deceive Vermonters.

Gaz Metro of Quebec, Canada, owns GMP. It recently acquired Central Vermont Public Service Corporation. It now controls at least 70% of Vermont's electric energy market.

The capital cost would be at least  $63 \text{ MW} \times \$2,500,000/\text{MW} = \$157.5$  million, excluding grid modifications. The \$2,500,000/MW is from recently built Maine ridge line wind turbine facilities.

[http://www.coalitionforenergysolutions.org/maine\\_wind\\_farms.pdf](http://www.coalitionforenergysolutions.org/maine_wind_farms.pdf)

The reality is the Lowell Mountain wind turbine facility would be a capital intensive, highly visual, noisy facility that is proposed to be built on environmentally-sensitive ridge lines. The wind turbines would be about 440 feet tall, equal to a 40-story building, with noise-making rotors. People living within about a mile would be disturbed by an irregular din of whoosh type sounds, especially during nighttime.

### **Wind Energy Dispatch Value**

As wind speeds are highly variable and wind energy is proportional to the cube of the wind speed, a doubling of windspeeds cause 8-fold increases in highly-variable wind energy. As a result, wind energy consists of irregularly-spaced, sporadic spurts varying in amplitude and duration.

Quick-ramping plants, usually gas-fired gas turbines, need to ramp down and up at a percent of rated output to accommodate the ups and downs of wind energy fed into the grid; such plants are called balancing plants. Such operation significantly increases Btu/kWh and CO<sub>2</sub> emissions/kWh.

Grids with a significant capacity of utility-owned, quick-ramping plants may have sufficient spare balancing capacity to accommodate up to about 1 to 2 percent of wind energy penetration. In New England, currently with about 0.5% penetration, the presence of wind energy on the grid is not yet "noticeable", according to ISO-NE personnel. The main reason it is not noticeable is because of a lack of proper data measuring and recording of power plant operating data. As wind energy penetration becomes larger, say 1%, wind energy variations WILL become noticeable, especially during unstable weather.

About 10 - 15 percent of the year, wind speeds are too low (less than 7.8 mph) to produce any wind energy. Most of a year's wind energy production is at night during the winter. Accordingly, wind energy has near-zero dispatch value to grid operators, such as ISO-NE.

### **Wind Energy and Proposed Transmission Corridors**

Quebec, Newfoundland and Labrador are all interested to transmit their excess electrical energy via high voltage lines to population centers in southern New England which would require new transmission corridors.

Future wind turbines would be likely located in areas with the best winds, such as on the ridge lines of the north-south spine of Vermont, northern New Hampshire and western Maine; the latter two areas have greater average wind speeds than Vermont.

If they are connected to the new transmission corridors, the hydro plants of Quebec could perform the wind energy balancing function. The cost would likely be invisibly rolled into any power purchase agreements to avoid burdening the wind turbine facility owners with any wind energy accommodation fees; politicians providing another wind energy subsidy as part of doing "constituent service".

**Example of Opposition to Transmission Corridors:** The Northern Pass HVDC Transmission Line, capacity about 1,200 MW, is planned to be built from Windsor, Quebec, to Deerfield, New Hampshire. It would run partly in an existing right-of-way adjacent to an existing HVDC line in northern New Hampshire and would run for 16 miles via a new right-of-way through the White Mountain National Forest in New Hampshire. There

would be about 1,000, highly visible towers, each 80 to 135 feet high, looming over the landscape. The estimated cost would be about \$1.1 billion.

Public opposition to this project has been fierce. Imagine what the opposition would be to \$19 to \$25 billion of new, highly visible transmission lines to accommodate wind and balancing energy to existing grids.

Renewables aficionados, legislators, renewables vendors, project developers and financiers and others clamoring for wind energy appear to have no idea regarding the costs and the impacts on the quality of life (noise, visual and psychological), property values and the environment due to reorganizing the New England electric grid towards accommodating wind energy and balancing energy in a major way.

### **Wind Energy Accommodation Fees**

The Lowell Mountain wind facility will add extra owning and O&M costs to New England's rate payers. These costs are due to:

- increased use of the spare quick-ramping gas-fired balancing capacity of the grid.\*
- expanded transmission and distribution systems
- expanded weather prediction systems
- increased frequency regulation
- additional ISO-NE grid management efforts

These extra owning and O&M costs would be significant. What percentage of those costs should be charged as wind energy accommodation fees to GMP? Will GMP get a free pass?

\* Adding more wind turbines to the New England grid would not only deplete this spare balancing capacity, but require the addition of new capacity. Who will pay for this?

### **Wind Energy and CO2 Emissions Reduction**

The Lowell Mountain wind turbine facility has little to do with reducing CO2 emissions or generating wind energy. Most of the CO2 emissions that the wind energy was meant to reduce is offset by the increased CO2 emissions/kWh due to the inefficient operation of the gas-fired balancing facilities, as shown by this study. <http://theenergycollective.com/willem-post/57905/wind-power-and-co2-emissions>

### **Wind Energy and Circumventing Environment and Quality of Life Regulations**

State legislatures and state government agencies are pressured to pave the regulatory ways to essentially circumvent state environmental and quality of life laws. Pro-forma hearings, usually required by law, are held to create a semblance of democratic process but effectively are rubber-stamp approvals of pre-ordained decisions.

The Lowell Mountain wind turbine facility received a Certificate of "Public Good" from the Vermont Public Service Board, a mostly political entity, regardless of widespread public opposition regarding impacts on quality of life (noise, visual, psychological), property values and the environment. <http://vtdigger.org/2011/07/06/lowell-wind/>

To soften-up the opposition in the Town of Lowell, GMP would donate more than \$500,000/yr to the Town of Lowell for hosting the Lowell Mountain wind turbine facility. Whereas the surrounding towns also have impacts on quality of life (noise, visual, psychological), property values and the environment, they would get nothing.

Will the Town of Lowell declare the 5-mile long facility access road a town road and provide for free the costly road maintenance and snow plowing at an elevation of more than 2,000 ft? Would that not adversely affect town equipment?

<http://www.bartonchronicle.com/index.php/wind-power-lowell-mountain/in-lowell-which-way-is-the-wind-blowing.html>

State representatives from surrounding towns, opposed to the Lowell Mountain wind turbine facility, urged members of the Vermont Electric Cooperative to vote against increasing the transmission line capacity that would primarily serve the wind turbine facility.

The new transmission line would be another freebie for wind energy at the expense of VEC members who would already get to pay higher rates because of the expensive wind energy being rolled into the VEC cost basis?

<http://vtdigger.org/2011/07/07/lawmakers-urge-defeat-of-power-line-upgrade-linked-to-lowell-wind-project/>

<http://vtdigger.org/2011/06/15/green-mountain-power-requests-modifications-to-lowell-permit-conditions/>

Because of quality of life impacts (property values, visuals and environmental), the governments of Denmark and the Netherlands, after years of increasing public protests against wind turbine facilities, have finally stopped construction of onshore wind turbines.

<http://theenergycollective.com/willem-post/51642/dutch-renewables-about-face-towards-nuclear>

### **Wind Energy and Job Creation**

The Lowell Mountain wind turbine facility job creation is largely a mirage. The facility would temporarily employ a number of people during the construction phase for about a year. During the next 20 years, just a few people would be permanently employed to perform operations and maintenance. An enormous waste of capital to create just a few permanent jobs, as shown by this Vermont Department of Public Service study.

<http://publicservice.vermont.gov/planning/DPS%20White%20Paper%20Feed%20in%20Tariff.pdf>

### **Wind Energy and Tax Shelters**

The federal government and state legislatures are pressured to provide increasingly greater subsidies to politically well-connected renewables vendors, developers, financial entities (such as Goldman Sachs on Wall Street) and their high-income clients who use them for tax shelters.

Over the past 10 years, the subsidies for wind turbine facility owners have become so excessive that facilities are built in marginal wind areas, as on most Vermont ridge lines, or before facilities are built to transmit the wind energy to population centers, as in the Texas Panhandle, just to cash in on the lucrative subsidies.

The Lowell Mountain wind turbine facility would not be built if there were no subsidies equivalent to at least 50% of the capital cost. Without subsidies, the wind energy produced would be at least \$0.15/kWh delivered to the grid, significantly higher than New England average grid prices of about \$0.055/kWh.

The Lowell Mountain wind turbine facility has everything to do with grabbing as much federal subsidies as possible and "coursing" them through Vermont's economy for the short-term benefit of the well-connected few (including high-income, non-Vermonters looking for tax shelters and foreign companies supplying wind turbines), and at the long-term economic expense (higher electric rates) of the many.

### **Wind Energy and Subsidies; a partial list**

- Federal grant for 30% of the total project cost which also applies to Spanish, Danish, German and Chinese wind turbines thus creating jobs in those nations instead of the US. These nations would not dream to have such a measure benefitting US wind turbine companies.

- Federal accelerated depreciation allowing the entire project to be written off in five years which is particularly beneficial to wealthy, high-income people looking for additional tax shelters.

- Federal production credit of \$0.022/kWh of wind energy produced.

- Owners of wind turbine facilities receive Renewable Energy Certificates which they can sell on the open market. The RECs are subsequently bought by polluting companies that find it less expensive to buy the RECs

than clean up their pollution.

### **A More Effective Alternative to Wind Energy**

For the same capital cost a new 60% efficient combined cycle gas turbine facility, operated at rated output, in base-loaded mode, would produce about  $(\$157.6 \text{ million}/\$1,250,000/\text{MW}) \times 1 \text{ GW}/1000 \text{ MW} \times 8,760 \text{ hr/yr} \times \text{CF } 0.90 = 993.4 \text{ GWh/yr}$ , or about 16.5% of Vermont's 6,000 GWh/yr consumption, more than 5 times as much electrical energy per invested dollar. The levelized energy cost for advanced 60% efficient CCGT would be about \$0.0631/kWh, according to the US Energy Information Administration.

[http://www.energytransition.msu.edu/documents/ipu\\_eia\\_electricity\\_generation\\_estimates\\_2011.pdf](http://www.energytransition.msu.edu/documents/ipu_eia_electricity_generation_estimates_2011.pdf)

Some of the advantages of a gas-fired CCGT facility are:

- No grid modifications would be required
- No inefficient operation of gas-fired wind energy balancing facilities would be required
- Impacts on quality of life (visual, noise, psychological) and property values would be minimal
- The facility would take up only a few acres
- The electrical energy would be low-cost, steady 24/7/365, reliable and dispatchable