

**STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL**

**Petition of BNE Energy Inc. for a
Declaratory Ruling for the Location,
Construction and Operation of a 4.8 MW
Wind Renewable Generating Project on
Flagg Hill Road in Colebrook,
Connecticut (“Wind Colebrook South”)**

Petition No. 983

March 15, 2011

PRE-FILED TESTIMONY OF JOEL M. RINEBOLD

Q1. Mr. Rinebold, please state your name and position.

A. Joel Rinebold. I am Director of Energy Initiatives at the Connecticut Center for Advanced Technology (“CCAT”). CCAT is located at 222 Pitkin Street , East Hartford, Connecticut.

Q2. Please state your qualifications.

A. At CCAT, a federally-supported program established to strengthen technology-led economic competitiveness, I focus on energy and infrastructure planning, the advancement of advanced technologies such as renewable technology, fuels cell and hydrogen technology, and the deployment of renewable and sustainable energy facilities.

I administer several energy related grants and am the Project Manager and Prime Investigator for the US Department of Energy for two programs: Local Energy Assurance Planning for five Connecticut municipalities and for the development of regional hydrogen / fuel cell “Roadmap” guidance documents for the New England states, New York, and New Jersey; I administer and am the founder of the Connecticut Hydrogen-Fuel Cell Coalition and administer the Connecticut Hydrogen Economy Program; I

administer the Connecticut Biodiesel Program; I am Project Manager and Prime Investigator for the US Small Business Administration to manage the regional Northeast Electrochemical Energy Cluster in New England and New York; and I administer energy planning activities for other public entities including the University of Connecticut.

I was the founding Executive Director of the Institute for Sustainable Energy at Eastern Connecticut State University, established to promote an improved awareness of energy uses, efficient use of energy, and protection of environmental resources. I was Chair of the Legislative Task Force to assess energy infrastructure of southwest Connecticut and Chair of the Legislative Task Force to assess energy infrastructure crossing Long Island Sound. Previously, I was the Executive Director of the State of Connecticut Siting Council where I directed all activities for electric forecasting and the site regulation of energy, telecommunications, and waste management facilities. Prior to serving with the Connecticut Siting Council, I worked as the District Manager for the U.S. Department of Agriculture, Litchfield County Conservation District.

I have served as adjunct faculty at Middlesex Community College and Central Connecticut State University teaching senior and graduate level environmental planning classes. I am considered an expert in energy and telecommunications issues, and have presented papers and lectured on these issues throughout the United States and Canada. I am a Board Member of the Connecticut Power and Energy Society, a member of the Citizens Advisory Committee for the EPA Long Island Sound Study, and a recipient of

the Connecticut Department of Environmental Protection 2004 Green Circle Program Award.

I hold a Bachelor of Urban Planning from Central Connecticut State University and a Master of Community Planning and Area development from the University of Rhode Island.

Q3. Please describe your involvement in this matter.

A. CCAT was responsible for preparing an Economic Energy Analysis for this proposed. All work was conducted by me or under my direct supervision.

Q4. Please describe the process for conducting the Economic Energy Analysis.

A. At the request of BNE, CCAT conducted the Economic Energy Analysis which included an analysis of economic output that estimated job creation, provided a comparative analysis of the project to residential development, and estimated benefits to the State of Connecticut including provision of renewable energy credits to meet Connecticut's Renewable Portfolio Standards, reduction of greenhouse gases, and energy reliability.

Q5. Please describe how you prepared the Economic Energy Analysis.

A. Calculations to estimate property tax amounts were based on personal communication with Town of Colebrook Tax Office, and information from the CERC Town Profile, 2010. Job creation was based on information from the Connecticut Renewable Energy / Energy Efficiency Economy Baseline Study and US DOE models.

Renewable Portfolio Standard calculations are based on state law and Connecticut DPUC documents, greenhouse gas reduction estimates are based on US EPA models, and energy reliability calculations are based information from the US EIA and CERC.

Q6. Please describe your conclusions.

A. Wind Colebrook South will provide numerous and significant benefits to the residents of Colebrook. The direct value to the Town of Colebrook can be best characterized in terms of air quality and environmental benefits, local tax revenue, job creation, economic output, and alternative development to residential land use. An additional value while not direct to the Town of Colebrook is energy reliability and compliance with state policy for renewable energy generation and meeting Renewable Portfolio Standards (RPS).

Wind Colebrook South will be one of the first commercial wind projects in the state of Connecticut and it will help make the Town of Colebrook greener by producing renewable energy to exceed all of the Town's residential electric users usage on average over the course of a year. The wind turbines will produce 100 percent clean, renewable electricity with zero emissions and no water consumption, which will result in significant environmental benefits for the Town. Wind Colebrook South will also set a positive example for other communities that renewable energy is important to our future.

In addition to the environmental benefits, there are numerous economic benefits of the project that will directly benefit the residents of the Town. While I recognize that economic impacts, both positive and negative, are outside the Council's jurisdiction and

consideration, for illustrative purposes to better understand the reasons for development of renewable wind generation facilities, I have estimated that BNE may become the largest taxpayer in town, and the project will avoid residential development that would cost the town tens of thousands of dollars per year in additional taxes due to the additional services and educational costs that would result. The project will also provide economic development and green jobs to the local economy. There will be numerous jobs created during construction and at least one permanent position created as a direct result of the project. Again, while economic issues are not relevant to the Council's jurisdiction and decision-making criteria, the economic benefits of the wind project are significant and directly beneficial to the town. In addition, BNE is proposing to construct an on-site Renewable Energy Center for tours to educate and inform students, organizations and members of the public about the need for and benefits of wind energy and other sources of renewable energy. Below are further details of the benefits of Wind Colebrook South:

Q7. Will there direct environmental benefits associated with the development of the Project?

A. Yes, it has been calculated that the production of 12,614 MWh of clean renewable energy from the Project will reduce CO2 emissions, a greenhouse gas, by approximately 6,332 tons per year and generate approximately \$21,450 through the sale of carbon credits. The sale of the carbon credits will be through the Regional Greenhouse Gas Initiative (RGGI). RGGI is an auction process that Connecticut participates in to require

electric generators to purchase carbon allowances for generating carbon dioxide emissions produced from conventional fossil fuel power generation.

In addition, the Project is expected to result in the following emissions reductions benefits:

- 3,532 (lbs/yr) total nitrogen oxides reduction
- 7,190 (lbs/yr) total sulfur oxides reduction
- 12,664,858 (lbs/yr) total carbon dioxide

To put this further into perspective, the Project would provide 12,614 MWh of clean, renewable energy without carbon emissions, which is equivalent to the following:¹

- cars taken off the road – 1,731
- barrels of oil not combusted for electric generation – 21,069
- number of tree seedlings grown for 10 years – 232,299
- acres for carbon sequestered annually by pine or fir forests – 1,932

Q8. Will there be direct tax benefits to the Town of Colebrook?

A. Yes. The total tax assessment for the proposed turbines, ancillary equipment and the remaining vacant land is estimated to be \$213,525,² which may make the Project the

¹ Greenhouse Gas equivalency values were computed using the United States Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator located at <http://www.epa.gov/cleanenergy/energy-resources/calculator.html> by entering in the total KWh expected to be generated annually from the project, 12,614 KWh.

² The local property tax for the wind turbines and ancillary equipment is estimated to be \$208,404 based on the current mill rate of 24.81, and an assessment of \$8.4 million representing 70 percent of the total estimated installed cost for the Project of \$12 million. The approximately 76 acre parcel located at 29 Flagg Hill Road is currently assessed at \$74,950. This assessment is much lower than 70 percent of the current appraised value of \$294,900 because the parcel falls under the provisions of Connecticut Public Act 490. Connecticut Public Act 490 "allows farm, forest, or open space land to be assessed at its use value rather than its fair market or highest and best use value (as determined by the property's most recent "fair market value" revaluation) for purposes of local property taxation". Based on this current assessment and a mill rate of 24.81, the property taxes to the Town of Colebrook for the parcel located at 29 Flagg Hill Road

largest single source of tax revenue in the Town of Colebrook.³ It is anticipated that, on average, each household's taxes could be reduced by approximately \$380 per year because of the local property taxes that would be paid by the Project.⁴

Q9. Will the project create jobs?

A. Yes. In a recent study, a baseline was developed that identified the number of renewable energy and energy efficiency companies in Connecticut, the number and types of jobs in these companies, and the revenue and employment income generated by this sector. There are currently 72 companies in Connecticut that are engaged in the renewable energy industry, which accounts for 1,691 direct jobs and 2,706 indirect and induced jobs, \$92 million in direct job employment income, and \$217 million in direct revenue. It was reported that the wind industry accounts for approximately 5 percent of the total direct jobs; this equates to 85 direct jobs, \$4.6 million in direct employment income, and approximately \$11 million in industry revenues.⁵

With respect to the employment impact during the construction phase of this project, it is expected that 9 local jobs will be generated in construction, management and administration occupations paying an average wage of approximately \$63,000 per year in salaries and benefits. An additional 16 jobs will be generated in the wind power equipment manufacturing industry paying an average wage of approximately \$45,000 per

is approximately \$1,860. However, if the parcel were no longer eligible for a reduced assessment, consistent with the provisions of Connecticut Public Act 490, the estimated property taxes on the land for the parcel at 29 Flagg Hill Road would be \$5,121. The combined \$208,404 plus the \$5,121 equals the estimated assessment of \$213,525 for the Project.

³ Personal communication with Colebrook Tax Office.

⁴ CERC Town Profile, 2010 – The number of households is approximately 560.

⁵ CT Renewable Energy / Energy Efficiency Economy Baseline Study, Phase 1 Deliverable: Full Report, Navigant Consulting, Inc., March 27, 2009.

year in salaries and benefits. Seven additional indirect/induced jobs will result from changes in household spending as a result of the direct and indirect spending from the project.⁶

During the operational phase of the Project, approximately \$37,400 of local spending is expected annually on operations and maintenance. This is expected to support approximately one part time job. In addition, other local spending impacts totaling \$48,400 are expected annually, which will support part time employment opportunities in Connecticut's service sector.⁷

Q10. Will the project create economic revenues for the town?

A. Yes. The Project is expected to result in economic benefits for the Town and State:

- \$2.4 million in expenditures for local/regional services and materials associated with the development of the Project; and
- \$3.9 million in additional gross state/domestic product.⁸

The Project is also expected to result in annual revenues for BNE Energy Inc. These revenue streams would result in additional corporate income tax revenue for the State of Connecticut. In addition, the Project will contribute to the development of Connecticut's wind industry and supply chain.

⁶ The value of jobs is calculated by dividing the cumulative sector incomes by the total employment expected within the sector.

⁷ US DOE JEDI Model

⁸ Gross State/Domestic Product (GSP) includes the final market value of all finished goods and services produced by the state economy in one year.

Q11. What economic impact would result to the Town of Colebrook if the project site were developed for residential use?

A. As discussed above, the Project is expected to result in \$213,525 in the first year in property taxes for the Town of Colebrook; or approximately \$5.34 million over the 25 year life of the project using 2010 dollars. This projected tax revenue for the community would ease pressure on strained municipal budgets.

A comparative land use analysis was developed to assess the Project's net benefits associated with tax revenues compared to developing the property as residential housing. It should be noted that the land use analysis for the Project only considers the potential impact on the Town's expenditures for education, which constitutes approximately 70 percent of the Town's total annual expenditures.⁹ Unlike residential development, it is not anticipated that the Project would require any significant town services.

As detailed below, potential residential development of the project site could provide tax revenue estimated at \$44,286, but education costs for the potential residential development is estimated at \$186,246, resulting in a net cost to the Town of Colebrook of \$141,960 for one year. The annual tax revenue associated with the Project is estimated at \$213,525 for the first year. Consequently, the range of the impact spread is estimated at \$355,485 for the first year.

⁹ CERC Town Profile, 2010

Chart 1: Residential Comparative Analysis¹⁰

Housing Analysis	
Acres in Development	76
Potential Home Construction	10
Education Cost Analysis	
Children Per Home ¹¹	1.35
Education Cost Per Child ¹²	\$13,796
Potential Education Costs	\$186,246
Tax Revenue Analysis	
Median House Price ¹³	255,000
Assessed Value @ 70%	178,500
Property Tax Per House @ 24.81 mills	\$4,429
Total Property Tax Revenue (house only)	\$44,286
Net Education/Tax Revenue Analysis	
Potential Education Costs	\$186,246
Total Annual Property Tax Revenue (house only)	\$44,286
Net Community Benefit/(Cost)	(\$141,960)
BNE Wind Prospect Tax Revenue Analysis	
Assessed Project Value	\$8,400,000
Taxable Value As % of Assessed Value	2.481
Property Tax Revenue (includes land assessment of \$5,121)	\$213,525
Total Potential Net Annual Project Revenue Analysis	
Net Community Benefit/(Cost)	(\$141,960)
Project Tax Revenue	\$213,525
Total Potential Project Impact Spread	\$355,485

Note: Chart 1 depicts the education costs and tax revenues associated with residential development of the Project site. Education costs are then subtracted from the estimated

¹⁰ Analysis assumes revenues and costs for one year

¹¹ Residential Demographic Multipliers – Estimates of the Occupants of New Housing, Rutgers University, Center for Urban policy Research, June 2006.

¹² CERC Town Profile, 2010

¹³ CERC Town Profile, 2010

tax revenues associated with residential development, which produces a net community cost estimated at \$141,960 because education expenditures would exceed tax revenue. Chart 1 also depicts the projected tax revenue associated with the Project. The total potential Project impact spread is estimated at \$355,485.

Q12. Will the project help meet state policy for the provision of renewable energy?

A. Yes. The Project will provide support to Connecticut's existing public policy framework including Connecticut's Renewable Portfolio Standards (RPS). The RPS require electric distribution companies to procure a percentage of the power they sell from Class I renewable energy sources. The most recent RPS compliance report published by the Connecticut Department of Public Utility Control (DPUC) indicates that electric distribution companies have been unable to procure sufficient amounts of Class I renewable energy to meet mandated goals.¹⁴ The production of 12,614 MWh of clean renewable energy will generate 12,614 renewable energy credits (RECs), which would be approximately 0.5 percent of the 2011 RPS goal. In addition, the Project will increase the supply of Class I renewable energy in the State of Connecticut by approximately 12,614 MWh per year.

Q13. Will the project provide benefits for energy reliability?

A. Yes. The Project would also improve energy reliability to the Town of Colebrook and the region. The project would provide the equivalent of over twice the annual electric power needs for the Town's residential electric users on average. The project would, on average, meet the electric needs of approximately 1300 homes in the region.

¹⁴<http://www.dpuc.state.ct.us/FINALDEC.NSF/0d1e102026cb64d98525644800691cfe/922bc6404463e2a88525742000594c8b?OpenDocument&Highlight=0.07-09-14>

Q 14. How will the facility be connected to the grid to improve energy reliability?

A. Interconnection will be made to the CL&P 23 kV distribution system at an existing 23 kV distribution feeder on the existing distribution system at Route 44, Winsted Norfolk Road in accordance with CL&P technical standards and State of Connecticut, ISO-New England (“ISO-NE”), and the Federal Energy Regulatory Commission (“FERC”) requirements. The interconnection will be made pursuant to CL&P and United Illuminating Company (“UI”) Guidelines for Generator Interconnection and will include Company Scoping, an Application Request, Application Review, a Feasibility Study, a System Impact Study, a Transmission Study, an Interconnection Agreement, Interconnection Authorization, Installation, Commissioning Test(s), and final approval to energize. BNE has successfully completed Company Scoping, an Application Request, and Application Review, and is now completing the Feasibility Study. A System Impact Study will be completed next which will include Circuit Modeling, Power Flow Analysis, Voltage Impact Study, Thermal Impact Study, Short Circuit Study, Review of Distribution Equipment Interrupting Ratings, Protection Coordination Review, Assessment of Transfer Trip Requirements, and Review of Protection Schemes. Upon completion of the System Impact Study, BNE will engage in the Transmission Study as a final step for an Interconnection Agreement, Interconnection Authorization, Installation, Commissioning Test(s), and final approval to energize.

Q15. Do you wish to make any remarks regarding the use or application of setbacks?

A: Yes. BNE has in my opinion established an adequate buffer of at least 984 feet to the nearest residential dwelling to protect the public and safety. This buffer to a residential dwelling would exceed the maximum tip height of the proposed facility with the proposed 100 meter tower and either an 82.5 meter diameter or 100 meter diameter blade. This buffer would also exceed a setback equal to 1.5 times the maximum tip height of the tower with either an 82.5 meter diameter blade or a 100 meter diameter blade. This buffer would also meet a setback equal to 1.5 times the maximum height of the tower plus the diameter of the blade with either an 82.5 meter diameter blade or a 100 meter diameter blade. I do point out that there may be some lightly traveled areas on Flagg Hill Road and a driveway at 29A Flagg Hill Road that would be marginally within the 984 foot buffer, but these lightly traveled areas do not appear to violate the GE setback recommendations for residences. I point out for the record that there is a residence within the buffer, but this structure is under the control of BNE and is considered to be part of the project.

Q 16. Does BNE comply with GE recommended setbacks?

A: Yes. I have reviewed GE's recommended setbacks and BNE Colebrook South project appears to comply with the recommended residential setback recommendations for facilities using an 82.5 meter or 100 meter diameter blade. As I have previously stated, there may be some lightly traveled areas on Flagg Hill Road and a driveway at 29A Flagg Hill Road that would be marginally within the 984 foot buffer, but these lightly traveled areas do not appear to violate the GE setback residential recommendations. Furthermore, GE will also have the opportunity to reach its own

conclusion regarding compliance with its setback considerations for wind turbine siting. GE is a Connecticut based company and the leading manufacturer of wind turbines in the United States. There are more than 13,500 GE wind turbines installed worldwide with more than 218 million operating hours and 127,000 GWh of energy produced. The proposed turbine is one of the world's most widely used wind turbines. With this information I believe that GE is a conservative company and I am not aware of any other wind turbine manufacturer that has setbacks requirements more stringent than those used by GE. It is also my understanding that GE will not sell a wind turbine unless there is compliance with setback considerations, setback recommendations, and a safety review. It is my understanding that GE cannot compete for many wind turbine installations that are located nearby homes and schools.

That apparently is the case in Templeton at the Narragansett Regional High School. The wind turbine is a 1.65 MW AAER turbine owned by Templeton Municipal Light & Water Plant ("TML"), and located at the high school. The closest home is less than approximately 500 feet from the wind turbine, the school is approximately 640 feet from the wind turbine, and there are 14 homes less than approximately 920 feet from the turbine. According to the TML, originally GE was engaged with the TML to build the wind turbine, but subsequently GE had to decline development due to the application of GE setback considerations which include setback recommendations and a detailed safety review. As a result, TML contracted with AAER for the wind turbine. It should be noted, that according to TML the wind turbine began operations in October 2010 and the project has been extremely successful even though the setbacks are less than what is required by GE. TML has not received any complaints from nearby residents, and has

indicated that the only time people call is over concern when the turbine is not spinning due to the lack of wind on that particular day. It is therefore, my opinion that compliance with GE recommended setbacks and safety review will be adequate to ensure safe and reliable service and protect public health and safety.

Q 17. Is it typical for regulatory jurisdictions to use setbacks for wind facilities?

A: There does not appear to be a standard or typical state setback, and most states do not have minimum setback requirements for wind facilities. Based on a recent OLR analysis of state wind turbine regulations, only ten states (California, Delaware, Illinois, Maine, New Hampshire, Ohio, South Dakota, Vermont, Wisconsin, and Wyoming) have siting statutes or regulations with specific provisions on wind projects. The OLR report is attached hereto. Based on this OLR report and my own research it appears that 15 state regulatory jurisdictions have established formal setbacks or guidelines for wind facilities. In addition, formal provisions for noise control are not uncommon. States including Delaware, Illinois, New Hampshire, Ohio, and South Dakota use setback standards that are 1.0 to 1.5 times the maximum tip height (MTH).

Some jurisdictions require setbacks that exceed 1,000 feet or 1.5 times the maximum tip height; however these provisions do not appear to be widely agreed upon. Further, these setbacks may have a detrimental effect to preclude or reduce opportunities for development of wind facilities and would be considered problematic by wind developers. For example, Wisconsin's current setback requirements are 1.1 to 3.1 times MTH or 1,250 feet, but proposals to increase setbacks have become controversial and if enacted

may have a significant effect to reduce the development of wind facilities in the state. This effect would also reduce the development of renewable energy, reduce the curtailment of foreign supplied energy, reduce the establishment of “green” jobs, and reduce the reduction of air pollutants and carbon emissions that generally occur with the development of wind facilities.

Other jurisdictions such as Maine and Vermont exercise their jurisdiction on a case by case basis to balance the public need for renewable energy with the site specific characteristics identified at and near a proposed facility. Some states such as Massachusetts and California defer to local jurisdictions. Below is a chart of state setback requirements:

State/Possession	Wind Setback Requirement
ALABAMA	NO
ALASKA	NO
ARIZONA	NO
ARKANSAS	NO
CALIFORNIA	BY COUNTY
COLORADO	NO
CONNECTICUT	NO
DELAWARE	1 MTH BY LOCAL
DISTRICT OF COLUMBIA	NO
FLORIDA	NO
GEORGIA	NO
HAWAII	NO
IDAHO	NO
ILLINOIS	1.1 MTH BY LOCAL /COUNTY
INDIANA	NO
IOWA	NO
KANSAS	NO
KENTUCKY	NO
LOUISIANA	NO
MAINE	BY LOCAL
MARYLAND	NO

MASSACHUSETTS	BY LOCAL
MICHIGAN	Guides 1.5 (HH + BD)
MINNESOTA	3.0 to 5.0 ROTOR DIAMETER
MISSISSIPPI	NO
MISSOURI	NO
MONTANA	NO
NEBRASKA	NO
NEVADA	NO
NEW HAMPSHIRE	1.5 MTH BY LOCAL
NEW JERSEY	NO
NEW MEXICO	NO
NEW YORK	BY LOCAL OR COUNTY
NORTH CAROLINA	NO
NORTH DAKOTA	NO
OHIO	1.1 MTH or 750'
OKLAHOMA	NO
OREGON	LOCAL WITH STATE OVERRIDE
PENNSYLVANIA	NO
PUERTO RICO	NO
RHODE ISLAND	NO
SOUTH CAROLINA	NO
SOUTH DAKOTA	1.1 MTH OR 500'
TENNESSEE	NO
TEXAS	NO
UTAH	NO
VERMONT	BY LOCAL
VIRGIN ISLANDS	NO
VIRGINIA	NO
WASHINGTON	NO
WEST VIRGINIA	NO
WISCONSIN	1.1 to 3.1 MTH OR 1,250'
WYOMING	5.5 MTH or 1000' BY COUNTY

Q.18. Does this particular site have attributes that should require a larger buffer than that proposed?

A: No, I believe that this Colebrook South site is relatively large open land area buffered by rural development, forested land, a gun club, and is nearby a State

transportation artery. I believe that the 984 foot buffer is appropriate for a facility using the 82.5 meter or 100 meter blade, but that that noise restrictions should be enforced. BNE has demonstrated that the proposed turbine locations comply with state and local sound regulations. Restrictions in excess of these limits may have a general effect to preclude wind development in the State and may be considered inconsistent with State policy that seeks to promote the development and use of wind energy for the common public good to improve energy sustainability, reduce import of foreign energy products, protect environmental resources including air resources and the global climate, and to promote the development of “green” jobs centered around a sustainable energy economy.

Q. 19. Please describe FAA lighting requirements.

A. Based on wind turbine lighting guidelines from the FAA, flashing red (L864), or white (L-865) lights may be used to light wind turbines. The FAA has indicated that studies have shown that red lights are most effective, and should be the first consideration for lighting recommendations of wind turbines. As a result, BNE proposes to utilize red lights on at least two of the wind turbines. The light fixtures will be placed on the turbine nacelle and will flash simultaneously.

The FAA guidelines also indicate that the white paint most often found on wind turbine units is the most effective daytime early warning device. Other colors, such as light gray or blue, appear to be significantly less effective in providing daytime warning. Daytime lighting of wind turbine farms is not required by the FAA, as long as the turbine structures are painted in a bright white color or light off-white color most often found on

wind turbines. The GE 1.6-82.5 wind turbines will be white and therefore not require daytime lighting.

The specifications of the red lighting option that BNE proposes to utilize to comply with FAA lighting requirements are as follows:

1. IFH-1710-000 Red LED Obstruction Light (Red at night only)

Specifications: Complies with FAA AC150/5345-43F Type L-864 and ICAO Annex 14, Medium Intensity, Type B

Night Intensity: 2,000 \pm 25% effective candelas

Beam Pattern: 360° Horizontal, \geq 3° Vertical

Flash Rate: 20FPM or 30FPM Red Night, selectable

Q19. Can you summarize your conclusions?

A. Yes. The Project will provide significant environmental and economic benefits to the Town of Colebrook. The Project will significantly reduce emissions of harmful air pollutants thereby improving public health. The Project will also reduce greenhouse gas emissions by **6,332 tons** annually with the production of **12,614 MWh** of renewable energy. In addition, the Project is expected to result in **\$2.4 million** in expenditures for local/regional services and materials associated with the development of the Project; **\$3.9 million** in additional gross state/domestic product; and approximately **32 jobs**, with at least 9 of these locally in Connecticut. The Project is estimated to generate approximately **\$213,525** in property taxes in the first year for the Town of Colebrook or approximately **\$5.34 million** over the 25 year life of the project without requiring any significant town services. The total potential project impact spread is estimated at

\$355,485 based on tax revenue provided by the Project and deferred education costs (or savings) to the Town associated with residential development. The ongoing operation of the Project is also expected to support local jobs. Lastly, the Project supports public policies designed to increase Connecticut's use of Class 1 renewable energy and help meet Connecticut's 2011 RPS goals, which will provide some direct and indirect benefits to the Town of Colebrook.

Q.20. Does this conclude your testimony?

A. Yes.

March 14, 2011
Date


Joel M. Rinebold

Subscribed and sworn before me this ___ day of March, 2011.

By: _____
Notary

ACTIVE/E/72955.2/CLARSON/2406304v1

EXHIBIT 1



OLR RESEARCH REPORT

February 16, 2011

2011-R-0023

Revised

STANDARDS IN OTHER STATES FOR SITING WIND PROJECTS

By: Kevin McCarthy, Principal Analyst

You asked for a summary of energy facility siting laws in other states that apply specifically to wind projects.

SUMMARY

We have found ten states (California, Delaware, Illinois, Maine, New Hampshire, Ohio, South Dakota, Vermont, Wisconsin, and Wyoming) that have siting statutes or regulations with specific provisions on wind projects. In most cases, the legislation was adopted in the past few years. Among the most common issues addressed in these laws are setback standards and maximum allowable noise levels.

The laws take differing approaches. California, Delaware, Illinois, New Hampshire allow local governments to restrict the siting of wind projects, subject to statutory limits. California's law is limited to small projects located in non-urbanized areas and New Hampshire's to small systems. Maine requires the regulatory agency to consider the impact of a wind project on scenic values and requires large projects to enter into community benefits agreements with the host community, as well as having setback provisions. Ohio regulates wind projects at the state level and imposes setback requirements and noise restrictions on such projects, among other things. South Dakota establishes set back requirements for wind projects. Wisconsin required its Public Service Commission (PSC) to develop administrative rules that specify the restrictions that political subdivisions may impose on the installation or use of wind systems. Vermont limits local

height restrictions and requires its Public Service Board to consider esthetic impacts in approving projects. Wyoming requires developers of larger wind projects to obtain a county permit and establishes minimum conditions for these permits.

CALIFORNIA

Legislation adopted in 2009 authorizes counties to (1) adopt an ordinance that provides for the installation of small wind systems (those with a generating capacity up to 50 kilowatts) in non-urbanized areas within the county's jurisdiction and (2) establish a process for issuing conditional use permits for these systems, subject to specified limits. The law (7 Cal. Gov. Code Sec. 68593 *et seq.*) also authorizes a county to impose conditions on the installation of these systems, but prohibits the county from imposing conditions regarding these aspects of the systems that are more restrictive than those specified in the law.

The law authorizes a county that has not adopted an ordinance providing for the installation of these systems within its jurisdiction by January 1, 2011, to adopt an ordinance covering subsequent installations so long as it is consistent with the state law. The law specifically exempts ordinances approved prior to January 1, 2011 from its provisions.

The county ordinances may impose conditions on the installation of small wind energy systems that include notice, tower height, setback, view protection, aesthetics, aviation, and design-safety requirements. But these provisions cannot be more restrictive than the following requirements and conditions:

1. the system must be located on at least one acre located outside an urbanized area;
2. for sites up to five acres, the maximum tower height is 80 feet;
3. for larger sites the maximum tower height is 100 feet, subject to further restrictions imposed by the Federal Aviation Administration;
4. the maximum setback for the tower can be no more than the tower's height, unless a greater setback is needed to comply with the applicable fire setback under the state Public Resources Code;
5. noise from the system as measured at the nearest property line may not exceed the lesser of 60 decibels or any existing maximum noise levels allowed under the applicable zoning or noise regulations, except during events such as utility outages and severe windstorms;
6. notice of an application to install a small wind system must be provided to property owners within 300 feet of the site and a county may require an applicant to place a one-eighth page notice in a local newspaper if it deems this necessary due to circumstances specific to the proposed installation;

7. the system may not substantially obstruct views of adjacent property owners and must be placed below any major ridgeline when visible from any scenic highway corridor designated under state law or by a county in its general plan;

8. the system must use a wind turbine that has been approved by the state Energy Commission as qualifying under its Emerging Renewables Program or certified by a national program recognized and approved by the commission; and

9. the application must include standard drawings and an engineering analysis of the system's tower, showing compliance with the current version of the California Building Standards Code and certification by a professional engineer licensed by the state.

The county may also require the applicant to demonstrate that the system will be used primarily to reduce onsite consumption of electricity.

The act's provisions sunset January 1, 2017.

DELAWARE

A Delaware law adopted in 2009 (Del. Code Tit. 29 Sec. 8060) bars county and municipal governments and homeowner associations from prohibiting or restricting a property owner from using a system for obtaining wind energy for a residential single family dwelling unit. Any such restriction adopted after the law went into effect in 2009 is void and unenforceable.

The law allows a county or municipal government or homeowner association to impose restrictions on wind energy system on other types of property, so long as they are no more restrictive than the following:

1. wind turbines must be setback the amount of the turbine's height from adjoining property line;

2. the aggregate noise or audible sound of a wind system may not exceed five decibels above the existing average noise level of the surrounding area and be no more than 60 decibels measured at any location along the property line of the parcel where the wind system is located; and

3. wind systems must be free from signs, advertising, flags, streamers, decorative items, or any item unrelated to the turbine's operation and wiring for the turbines must be placed underground for systems not integrated with the building.

These provisions do not apply to any county or municipal designated historic district or historic zoning district. Any wind energy system must be buffered from any properties or structures included on the Historic Register.

ILLINOIS

Illinois law (55 Ill. Code Secs. 5/5-12020 and 5/11-13-26) adopted in 2009 allows counties and municipalities to regulate the siting of wind projects. 55 Ill. Code Sec. 5/5-12020 allows counties to establish standards for wind farms and electric-generating wind devices. The standards may include the height limits and the number of devices that may be located in a geographic area. A county may also regulate the siting of wind farms and electric-generating wind devices in unincorporated areas of the county outside of the zoning jurisdiction of a municipality and the 1.5 mile radius surrounding the zoning jurisdiction of a municipality. The law requires at least one public hearing not more than 30 days before a siting decision by the county board. Notice of the hearing must be published in a local newspaper. Counties may allow test wind towers to be sited without formal approval by the county board, but they must be dismantled within three years of installation. However, a county may not require a wind tower or other renewable energy system that is used exclusively by an end user to be set back more than 1.1 times the height of the system from the end user's property line.

Parallel provisions apply under 55 Ill. Code Sec. 5/11-13-26 to municipalities, which can regulate wind farms and electric-generating wind devices within a 1.5 mile radius surrounding their zoning jurisdiction.

MAINE

State Goals

The state's wind energy act (35-A Me. Rev. State Sec 3403 *et seq.*) was adopted in 2003 and substantially amended in 2007 and 2009. It states that “it is in the public interest to reduce the potential for controversy regarding siting of grid-scale wind energy development by expediting development in places where it is most compatible with existing patterns of development and resource values when considered broadly at the landscape level.” The act sets a goal of creating 2,000 megawatts (MW) of wind generating capacity by 2015, 3,000 MW by 2020, and 8,000 MW by 2030.

Consideration of Effect on Scenic Character

In making its findings regarding the effect of an expedited wind development on scenic character and related existing uses, the primary siting authority must determine whether the development significantly compromises views from a scenic resource of state or national significance (e. g. , a state park or federal

wilderness area) such that it unreasonably harms its scenic character or the related existing uses. (The primary siting authority is the Department of Environmental Protection (DEP) or the Maine Land Use Regulation Commission, depending on where the development is located.) In most cases, it is not necessary for the authority to find that a development fits harmoniously into the existing natural environment in terms of potential effects on scenic character and related uses in order to approve the development.

In making its determination and in determining whether the developer must provide a visual impact assessment, the primary siting authority must consider several factors, including:

1. the significance of the potentially affected scenic resource;
2. the existing character of the surrounding area;
3. the extent, nature and duration of potentially affected public uses of the scenic resource and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource.

The developer must give the primary siting authority a visual impact assessment of the development that addresses the evaluation criteria if the authority determines the assessment is needed. There is a rebuttable presumption that an assessment is not required for those portions of the development's generating facilities that are more than three miles from a scenic resource of state or national significance. The primary siting authority may require an assessment for portions of the generating facilities located between three and eight miles from the scenic resource if it finds there is substantial evidence that an assessment is needed to determine if there is the potential for significant adverse effects on the resource. Information intended to rebut the presumption must be submitted to the primary siting authority by any interested person within 30 days of acceptance of the application as complete for processing. The primary siting authority must determine if the presumption is rebutted based on a preponderance of evidence in the record.

Permit Application

The developer must include the following as part of its permit application:

1. the estimated jobs to be created statewide and in the host community or communities, as a result of construction, maintenance, and operations of the project;
2. the estimated annual generation of wind energy;
3. the projected property tax payments; and

4. any other tangible benefits to be provided by the project.

Community Benefits Agreements

In the case of large developments, the developer must establish a community benefits package valued at no less than \$ 4,000 per year per wind turbine included in the development, averaged over a 20-year period. This does not affect the development's property tax obligations. The package must include an agreement between the developer and the host community that involves payments by the developer for public purposes, including property tax reductions, economic development projects, land and natural resource conservation, tourism promotion, or reduction of energy costs. The payments can be made in a lump sum or over time.

To the extent practicable within existing resources, the Department of Economic and Community Development and the State Planning Office must help the host community maximize the economic development and resource conservation benefits from tax payments and payments made under a community benefit agreement or a community benefits package.

The community benefits package requirement is waived for any development that (1) has an installed capacity of less than 20 MW or (2) is owned by a nonprofit, public or quasi-public entity. In addition, the host community can waive or reduce the requirement.

Setbacks and Other Requirements

If the primary siting authority determines that the development must be constructed with setbacks to protect public safety, the authority must consider the recommendation of a professional, licensed civil engineer as well as any applicable setback recommended by a manufacturer of the generating facilities. It may require submission of this information as part of the application.

Developers of facilities with a generating capacity of more than 100 kilowatts must demonstrate that they will:

1. comply with DEP noise standards;
2. be designed and sited to avoid unreasonable adverse shadow flicker effects; and
3. be constructed with setbacks adequate to protect public safety. taking in account the recommendation of a professional, licensed civil engineer as well as any applicable setback recommended by the facility's manufacturer.

If no other DEP approval is required for the development, DEP must issue its certification within 185 days of determining that a request for certification is complete, unless the applicant requests an extension. If another DEP approval is required for the development, DEP must consolidate its approval processes.

Following certification and during construction and operation, the municipality where the generating facilities are located can enforce the noise, flicker, and setback standards at its discretion. DEP is not responsible for enforcing the above provisions.

NEW HAMPSHIRE

State law adopted in 2008 imposes notice requirements for small wind systems (those with a generating capacity of up to 100 kilowatts) that are used primarily for on-site consumption, limits the ability of municipalities to regulate them, and requires that they be taken down when abandoned.

It also requires that they comply with all applicable Federal Aviation Administration requirements, including those regarding installations close to airports, and local airport zoning regulations.

Notice

N. H. Gen. Laws Sec. 674: 66 requires the municipal building inspector to notify all abutters by certified mail upon application for a building permit to build a small wind system. The applicant must pay the cost of the notice. Abutters have 30 days to comment before the building permit is issued. The building inspector must notify the local governing body. An appeal may be made to the building code board of appeals or to the zoning board of adjustment, as appropriate.

Limits on Local Regulations

N. H. Gen. Laws Sec. 674: 63 bars municipalities from imposing “unreasonable limits or hindrances to performance” on small systems. These are:

1. prohibiting small wind energy systems in all districts within the municipality;
2. restricting tower or system height by applying a generic height ordinance or regulation that does not specifically address allowable tower or system height of a small wind energy system;
3. requiring a setback from property boundaries for a tower more than 150% of the system height (if a municipality does not adopt specific setback requirements for small wind energy systems, any small wind energy system

must be set back at least this distance but the zoning board of adjustment may issue a variance under the condition specified in state law);

4. setting a noise level limit lower than 55 decibels, as measured at the site property line, or not allowing for limit overages during short-term events such as utility outages and severe wind storms; and

5. setting electrical or structural design criteria that exceed applicable state, federal, or international building or electrical codes or laws.

Review by Building Inspector

The building inspector must review the application to determine whether it is a development of regional impact. If the building inspector determines that the proposal has the potential for regional impact, he or she must give the regional planning commission and the affected municipalities the status of abutters for the purpose of providing notice and giving testimony. Within five business days after reaching a decision regarding a development of regional impact, the inspector must give the regional planning commission and affected municipalities with copies of the minutes of the meeting at which the decision was made. The inspector must, at the same time, submit an initial set of plans to the regional planning commission, at the applicant's cost. At least 14 days before the public hearing, inspector must notify all affected municipalities and the regional planning commission of the date, time, and place of the hearing and their right to testify concerning the development.

Abandonment

Under N. H. Gen. Laws Sec. 674: 65, a small system that is out of service for 12 consecutive months is deemed abandoned. The planning board administrator may issue a notice of abandonment to its owner. The owner can respond to the notice of abandonment within 30 days of receiving it. The planning board must withdraw the notice of abandonment and notify the owner that the notice has been withdrawn if the owner shows the planning board that the system has not been abandoned. If the system is determined to be abandoned, the owner must remove the wind generator from the tower at his or her expense within three months of receiving the notice of abandonment. If the owner does not do so, the administrator may pursue a legal action to have the wind generator removed at the owner's expense.

OHIO

By law, electric generation facilities need a certificate from the Ohio Power Siting Board. State regulations, Oh.Admin. Code Secs. 4906. 17-01 through 4906-17-08, adopted in 2008, prescribe specific requirements for a certificate for a wind project.

Information in Certificate Application

The certificate applicant must submit a project summary and overview of the proposed project. Among other things, this information must include:

1. the types of turbines or, if a specific model of turbine has not yet been selected, the potential types, estimated number of turbines, estimated net demonstrated capability, annual capacity factor, and hours of annual generation; and
2. a description of the major equipment including the footprint of the turbine, height of the turbine measured from the tower's base, excluding the subsurface foundation, and the blade length.

The applicant must conduct a project area site selection study before submitting its application. The study must evaluate all practicable project area sites for the proposed facility. As part of the study, a copy of any map the study used to show setbacks from residences, property lines, and public rights of way must be supplied to the board.

The application must contain detailed technical and safety information. Among other things, these include (1) all proposed major public safety equipment and the reliability of the equipment and (2) the turbine manufacturer's safety standards, including a complete copy of its safety manual or similar document.

Noise Studies

The applicant must also provide detailed environmental data for the project. For each turbine, the applicant must evaluate and describe (1) the operational noise levels expected at the property boundary closest to that turbine, under day and nighttime conditions and (2) the cumulative operational noise levels for the wind facility at each property boundary for each property adjacent to the project area, under day and nighttime operations. The applicant must use generally accepted computer modeling software (developed for wind turbine noise measurement) or similar turbine noise methodology, including consideration of broadband, tonal, and low-frequency noise levels. The application must identify the location of any noise-sensitive areas within one mile of the proposed facility. It must also describe equipment and procedures used to mitigate the effects of noise from the proposed facility during construction and operation.

Mapping and Setback Requirements

The application must include a 1: 24,000 scale map indicating land uses in a five-mile radius of the facility, including residential, urban, manufacturing, commercial, recreational, forest, and other uses. It must include a 1: 24,000

scale map covering a half-mile radius from the proposed facility that shows: (1) the proposed project area boundary; (2)

undeveloped land such as wood lots, wetlands, or vacant fields; and (3) recreational areas, parks, wildlife areas, nature preserves, and other conservation areas. The application must:

1. estimate the proposed facility's impact on these land uses within a one-mile radius of the facility,
2. identify structures that will be removed or relocated, and
3. describe formally adopted plans for future use of the site and surrounding lands for anything other than the proposed facility.

The application must provide the number of residential structures within 1,000 feet of the boundary of the proposed facility, and identify all residential structures for which the nearest edge of the structure is within 100 feet of the boundary of the proposed facility. It must describe proposed locations for wind turbine structures in relation to property lines and habitable residential structures, consistent with the following minimum requirements:

1. the distance from a wind turbine base to the property line of the wind farm property must be at least 1.1 times the total height of the turbine structure as measured from its tower's base (excluding the subsurface foundation) to the tip of its highest blade, and
2. the wind turbine must be at least 750 feet in horizontal distance from the exterior of the nearest habitable residential structure located on adjacent property at the time of the certification application.

These minimum setbacks may be waived if all owners of property adjacent to the turbine agree to the waiver.

The applicant must evaluate and describe the potential impact from ice throw and blade shear at the nearest property boundary, including its plans to minimize potential impacts if warranted. The applicant also must evaluate and describe the potential impact from shadow flicker at adjacent residential structures and primary roads, including its plans to minimize potential impacts if warranted.

Environmental Studies

The application must provide the results of surveys of the vegetation and animal life within a quarter-mile distance from the facility boundary. The application must provide a list of major species from these surveys. These are

species that are of commercial or recreational value or designated as endangered or threatened under state or federal law. The applicant must estimate the impact of facility construction and operation on these species. It must also provide a summary of any studies that have been made by or for the applicant addressing the ecological impact of the proposed facility.

SOUTH DAKOTA

S. D. Laws Sec. 43-13-23 requires each wind turbine tower less than 75 feet high be set back at least 1.1 times the height of the tower from any surrounding property line. Under S. D. Laws Sec. 43-13-24, larger towers must be set back at least 500 feet or 1.1 times the height of the tower, whichever is greater, from any surrounding property line. In both cases, the tower may be placed closer to the property line shared with that adjacent land owner if the tower owner has a written agreement with an adjacent land owner.

VERMONT

State law (24 Vt. Stat. Ann. Sec. 4412(6), adopted in 2004, bars municipalities from regulating the height of wind turbines with blades that are less than 20 feet in diameter unless the bylaws provide specific standards for regulation. Although not specified in statute, these standards could include address visual impacts and specific setback requirements according to the Vermont League of Cities and Towns.

Another law (30 Vt. Stat. Ann. Sec. 248) requires the Public Service Board to consider aesthetics in approving generation facilities. It must adopt rules regarding the application of its esthetics criterion to an application for a certificate for a single, net metered (i. e. , grid-connected) wind turbine that is less than 150 feet tall.

WISCONSIN

2009 Wisconsin Act 40 (Act 40 – Wis. Stat. Sec. 196.378) establishes statewide criteria for the installation or use of a wind energy system with a capacity of less than 100 megawatts, and helps ensure consistent local procedures for such systems. Act 40 directs the Public Service Commission (PSC) to develop administrative rules that specify the restrictions that may be imposed on the installation or use of wind systems. No political subdivision (city, village, town, or county) may impose, directly or indirectly, any restriction on the installation or use of a wind system that is more restrictive than the rules the PSC promulgates.

Act 40 also requires PSC to adopt rules must include:

1. setback requirements that provide reasonable protection from any health effects, including those from noise and shadow flicker, associated with wind systems;
2. requirements for removing wind turbines and other facilities associated with the wind system and restoring the site of the system;
3. the information and documentation to be provided in an application to demonstrate that a proposed wind system complies with the rules;
4. the information and documentation to be included in a political subdivision's record of decision;
5. the procedure a political subdivision must follow in reviewing an application for approval;
6. the requirements and procedures for enforcing the restrictions allowed under the PSC's rules.

The final rules require a wind energy system owner to give notice to landowners within one mile of proposed wind turbine locations at least 90 days before filing an application. They allow a political subdivision to require these systems to be sited and operated in a way that does not exceed 45 dB during nighttime hours and 50 dB during daytime hours. Noise limits will be measured from the outside wall of non-participating residences (those whose owners have not entered into a compensation agreement with the system owner) and occupied community buildings. A political subdivision can also require systems to be sited and operated in a way that does not cause more than 30 hours per year of shadow flicker for non-participating residences or occupied community buildings. If a wind energy system causes more than 20 hours per year of shadow flicker, a political subdivision can require its owner to install mitigation measures for affected landowners, at its expense.

A political subdivision can impose minimum safety setbacks of 1.1 times the maximum height of a turbine for participating residences, non-participating property lines, public road rights-of-way, and overhead communication and electric transmission or distribution lines. Setbacks of up to 3.1 times the maximum height of a turbine may be established for nonparticipating residences and occupied community buildings.

The rules allow local government units to require wind energy system owners to provide monetary compensation to non-participating landowners located within one-half mile of a wind turbine site. A political subdivision may not require these payments for non-participating landowners to exceed 25% of the payments being made to a landowner hosting a wind turbine in the project.

The rules establish complaint resolution requirements for wind energy system owners and a process for requesting political subdivision review of unresolved complaints. A political subdivision's decision on review of a complaint is appealable to the PSC. The rules require the owner of a wind system with a capacity of at least one megawatt to maintain proof of financial responsibility ensuring the availability of funds to decommission the system once it is no longer in use.

The rules are available at <http://psc.wi.gov/mediaRoom/documents/windSitingRules.pdf>

By law, an electric generating facility with a capacity of 100 megawatts or more may not be constructed unless the PSC grants it a certificate of public convenience and necessity. Act 40 requires the PSC to consider the restrictions specified in these rules when determining whether to grant a certificate.

WYOMING

Legislation passed in 2010, (Wyo. Stat. Sec. 18-5-501 through 513) requires the developer of any wind facility of 0.5 megawatts or more to obtain a permit from the board of commissioners of the county where the facility is located. A county permit is also required to expand any wind facility that was originally built after July 1, 2010.

The application must certify that the developer has made reasonable efforts to provide notice in writing to all landowners within one mile of the proposed facility and to all cities and towns located within 20 miles. The notice must include a general description of the facility, including its location, projected number of turbines, and the likely entrance and exit routes. The developer must publish a notice in a local newspaper at least 20 days before the public hearing on the application.

The developer must certify that there will be no advertising or promotional lettering on any tower, turbine, nacelle (the housing around the turbine), or blade (other than the manufacturer's or the applicant's logo on the nacelle). The developer must include a site and facility reclamation and decommissioning plan that indicates the facility's planned life and how the facility and its site will be decommissioned and reclaimed at the end of the facility's life. The developer must certify that any owner of land of the facility site who is not the applicant has been consulted in developing the plan. The plan must comply with all requirements adopted by the state's Industrial Siting Council. If the permit is granted, the plan must be updated every five years until site reclamation and decommissioning is complete. Developers must provide a detailed summary of any significant adverse environmental, social, or economic effects that the proposed wind energy facility may have together with any preliminary plans developed to alleviate these effects.

The board must require that the base of any tower be at a distance of at least 110% of the maximum height of the tower from (1) any property line contiguous or adjacent to the facility (unless waived in writing by the owner of every property which would be located closer than the minimum distance) and (2) any public road right-of-way. Any tower or other structure, other than underground structures, transmission lines, and roads, must be at least 5.5 times the maximum height of the tower and not less than 1,000 feet from any platted subdivision unless this restriction is waived in writing by the owners of all lands included within the specified distance. It requires the base of the tower to be the same distance from any residential dwelling or occupied structure, unless waived in writing by the person holding title to the dwelling or structure. Towers cannot be located within one-half mile from the limits of any city or town.

No county may adopt a less stringent standard. The minimum standards must be incorporated into every existing or future county permitting or licensing process to which they are applicable.

The board must review the application to determine if it contains all the required information. If the board determines that the application is incomplete, it must notify the applicant within 30 days of receiving the application. The applicant must provide the additional information within 30 days of receiving this request. The board must hold a hearing between 45 and 60 days after determining that the application is complete. The board must accept written comments for at least 45 days after determining that the application is complete. It must issue a decision within 45 days after completing the hearing. The board must grant a permit if it determines that the facility complies with all standards properly adopted by the board and the statutory standards.

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