

Harnessing the Wind On Tug Hill

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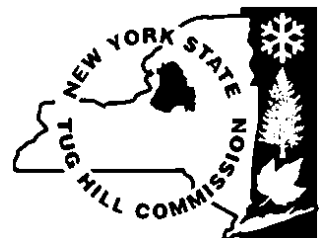


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The Tug Hill Commission *Technical and Issue Paper Series* are designed to help local officials and citizens in the Tug Hill region and other rural parts of New York State. The *Technical Paper Series* provides guidance on procedures based on questions frequently received by the Commission. The *Issue Paper Series* provides background on key issues facing the region without taking advocacy positions. Other papers in each series are available from the Tug Hill Commission at the address and phone number on the cover.

Wind energy development on Tug Hill poses big questions for local government

Wind turbines to produce electricity on a large scale – “wind farms” – are currently being proposed for parts of Tug Hill. Large-scale wind farms are a relatively new occurrence in the Northeast, and since they are new there are many questions that do not have clear answers. Who will review such a project? State and federal agencies may have review authority, but that review may not address local concerns. Additionally, this may be the first time an agency has needed to review a large-scale wind project, and they may not have all the answers immediately.

What is the local benefit of a wind farm? Since electricity generated is likely to be sold at prices set in the wholesale market, there is no near-term benefit of reduced energy costs to local governments or citizens. In New York, the cost of energy is set by the marketplace, and the cost of energy transportation or delivery remains regulated by the NYS Public Service Commission. It would take a special arrangement and much creative thinking to realize reduced energy costs to the community from a wind farm, though this is theoretically possible. There will, however, likely be payments to local governments similar to payments in lieu of taxes. There will also be payments to landowners on whose property a wind turbine is located, which could give a boost of money to the local economy. Payments to farmers may help the economics of local farming operations.

What are potential concerns? The largest concern will probably be how the wind farm looks, and possibly the impact on farmers in terms of creating obstacles for plowing and other farm management issues.

Wind energy development on Tug Hill holds potential promise and potential pitfalls. This paper attempts to address questions about local economic benefit, the effect on natural resources, who reviews and permits a wind farm, and highlights the important role local review may play.

Renewed interest in wind energy on Tug Hill

Although recent interest in using the wind to create electricity came to the forefront most recently at the end of 1999 and the beginning of 2000, it is not the first time a company has investigated the feasibility of harnessing the wind resource on Tug Hill. Niagara Mohawk Power Corporation installed test wind turbines in the Harrisburg, Martinsburg, and Copenhagen areas in the early 1990's to examine the potential for wind-generated electricity. Those wind turbines were removed several years later and Niagara Mohawk never developed the sites. The test data collected by those wind turbines, however, was actively sought after by companies most recently assessing the potential for wind farms in the northeast portion of Tug Hill. Additionally, the **New York State Energy Research and Development Agency** (NYSERDA) recently reformulated and updated wind data for the entire state. The data is available on-line at www.truewind.com.

Wind energy developers try to meet certain criteria when looking for potential wind farm sites. Wind resource, land use, and proximity to the electrical grid are three of the primary considerations. Tug Hill and Lake Ontario are considered to have some of the best wind resources in the state, outside of the Adirondack and Catskill Parks. However, wind development potential in the Adirondacks and Catskills may be limited by regulations on land use in the two parks, as well as public concerns.

Tug Hill's elevation and proximity to winds coming from Lake Ontario create relatively windy conditions. And while wind energy can be developed in forested areas (an older, smaller-scale wind project in Searsburg, Vermont is located in the forest, for example), there are many areas of agricultural land in parts of Tug Hill that are open and have relatively easy access, which wind farm developers prefer.

What is currently being proposed for Tug Hill?

Atlantic Renewable Energy Corporation (Atlantic), along with **Zilkha Renewable Energy** (ZRE), is proposing a 300-megawatt (MW) **Flat Rock Wind Power** (Flat Rock) project in the towns of Martinsburg, Harrisburg, and Lowville in Lewis County. (For reference, one MW of power is enough electricity to service approximately 300 to 500 homes. 1000 MW is the amount of power generated by the average nuclear power plant.) Additionally, Flat Rock has submitted an application to the NYS Public Service Commission (PSC) to build a 10.3-mile, 230 kilovolt (kV) transmission line and associated substation and interconnect facility through the towns of Martinsburg and Watson. This transmission facility will interconnect Flat Rock to Niagara Mohawk's 230 kV Adirondack Line high-voltage transmission grid. Flat Rock anticipates building Phase 1 (150 MW) of the wind farm in 2004, to be operational by December 2004. Phase 1 towers are located in the southern portion of the project area, in the town of Martinsburg. The second phase, another 150 MW, would likely be operational by December 2005, in the towns of Harrisburg and Lowville.

An earlier proposal was put forward by **DP Energy** for a medium-sized project of 30-35 MW (20 to 40 wind turbines) in Harrisburg, just south of Route 177, with a grid connection at the substation in Lowville. At this point in time, that proposal is on hold.

The 1.65 MW wind turbines that will be used for the Flat Rock project will produce approximately 5,225 Megawatt-hour (MWh) of electricity each year. The entire project will annually produce nearly 900,000 MWh of electricity, which is enough to supply the average annual needs of approximately 90,000 households, or 280,000 people—2.5 times the population of the Tug Hill region.

The expected costs of production of the Flat Rock Wind Power project are in the range of 4 to 4.5 cents per kWh. By comparison, Niagara Mohawk currently charges its residential customers 5 to 7 cents per kWh for the electric energy they purchase, with an additional fee for "delivery" of utility power.

Developers may consider other areas of Tug Hill, but Harrisburg, Martinsburg, and Lowville drew initial interest due to the good wind resource, potential availability of wind data from Niagara Mohawk and NYSERDA, and proximity to the electric grid in Lowville.

Today's wind farms essentially produce two products: the electric energy, which is a physical commodity sold into the nearby utility grid, and "renewable energy credits" (green tags), which are certificates that entitle the holder to claim the environmental attributes or benefits associated with the generation of renewable electricity.

The electric output from the Flat Rock project wind farm will be sold into the wholesale electric market at the interconnect point in Watson, with the energy being used by the nearest electric consumers—often including homes, farms and businesses in the North Country.

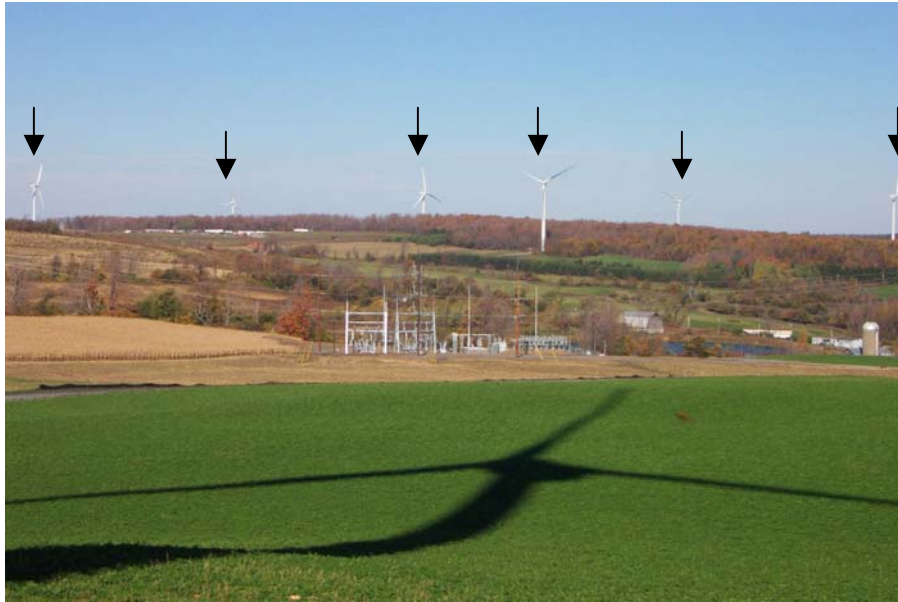
On the other hand, the green tags generated by the Flat Rock project will likely be sold to purchasers outside the area, and possibly outside the state. For instance, the state of Pennsylvania has a program that provides incentives for companies to purchase green/renewable energy like wind-generated electricity, which has created a demand for wind and solar energy. New York State does not currently have a similar "green energy" incentive program. The only incentives in New York are from federal programs. However, Governor Pataki issued an executive order in 2001 that requires the State of New York to buy 10% of their power from "green" sources by 2005, and 20% by 2010.

Additionally, in his State of the State address in early 2003, Governor Pataki announced his goal of establishing a Statewide Renewable Portfolio Standard (RPS). An RPS would require a certain amount of electricity in New York be generated by renewable resources, such as wind, solar, and hydropower. The New York RPS requirement under consideration requires that at least 25% of the retail electricity sales in the State be generated from renewable energy sources within 10 years. This would create a larger demand for facilities such as Flat Rock, and make them more economically viable. The PSC initiated a rule-making in April of this year to devise an RPS program for the state. This rule-making was originally expected to be complete by the end of 2003, but may take into 2004 to finish.

What might a wind farm look like?

As proposed by Flat Rock Wind Power, the wind turbines that will likely be used are approximately 400 feet tall (comprised of a 260-foot tower with a 130-foot rotor blade). That is approximately the height of a 40-story building (about 3 times the height of the Dulles State Office Building, the tallest building in Watertown). Towers this size are generally located about 1000 feet apart in a row, with each row about 2000 feet (1/3 of a mile) from the next. It is estimated that the 300 MW farm will cover an area nearly 12 miles long by about 2 miles wide, though only about 1% of this area would be actually

removed from agricultural production by access roads, towers, and associated building footprints.



Wind turbines and substation in the Town of Fenner, Madison County, developed by Atlantic Renewable Energy Corporation (arrows indicate turbine locations).

How does a wind farm affect property taxes and assessment?

The land occupied by a wind farm would be of greater value than farmland, and the land on which a wind turbine is located would be subject to assessment and property taxation. However, NYS Real Property Tax Law allows a 15-year exemption from any increase in assessed value due to the wind energy system (RPTL Section 487). For example, the wind turbine and associated electrical equipment would be considered tax-exempt. However, heating and cooling equipment for a building at a wind turbine would not be exempt. The county, town, and school district within which the wind energy system is located have the option to adopt the exemption, or not.

If tax exempt, how will local tax jurisdictions fare?

It is expected that a company developing a wind farm will work out an arrangement with the local taxing entities to make separate payments to taxing jurisdictions (similar to payments in lieu of taxes). Legislation was passed by the state in 2002 to make entering into such agreements easier for counties, towns, and school districts. The dollar amount of this payment would be negotiated between the company and the taxing entity. Preliminary estimates of what this payment may be to all three taxing authorities are around \$5,000/MW annually, which would be approximately \$1,500,000 per year, in the case of the Flat Rock project.

How enforceable are voluntary payment agreements?

The tax agreements put in place for the Madison and Fenner (NY) wind projects, which were also developed by Atlantic, have been in place since 1999 and 2000 without any challenges or problems. According to these voluntary agreements between the project company and the host town, the company agrees to pay \$5,000 per MW of installed wind capacity with the towns and school boards agreeing to treat the projects as “exempt” property. Responsibility for compliance with the Fenner tax agreement, entered into by the town and the project developer, Atlantic, was assumed by CHI Energy when it acquired the project in 2001. As with the other contractual obligations of a special purpose company formed to own and develop a wind project, it is unlikely that transfer of the project’s ownership after completion of construction would threaten compliance with the voluntary tax agreement.

Are landowners protected from tax liability?

Lewis County will be using a novel approach to placing the wind turbine towers on the tax rolls. Called the “suffix parcel” approach, this arrangement creates a new real property tax ID for each tower location that is separate from and independent of the “underlying” farm parcel in which the tower will be installed. Owned directly by the wind project company, all taxes due on the wind turbine tower and related equipment are the responsibility exclusively of the project owner, with no recourse to the owner of the underlying farm parcel. In this way the wind turbine towers are entered directly into the local town’s tax roll, and are not included in the assessment of the underlying parcel. This arrangement protects the owner of the underlying farm parcel against any disputes about the assessment of or taxes due on the wind turbine towers themselves.

Lewis County is also using an innovative method to improve the economic competitiveness of wind farms installed there. County officials have arranged to place the wind turbine tower locations in the County Empire Zone. As a result, all of Flat Rock’s wind turbine towers and related equipment will go on the local tax rolls as fully taxable property, with combined total tax payments to the three local towns, the two school boards and the County of about \$8.5 million per year. (Flat Rock wind will receive NY State tax credits offsetting these tax payments.) This will make it possible for Flat Rock’s sponsors to slightly reduce the project’s cost of generating power, which improves the project’s ability to market its electric output in a highly competitive industry.

What might the benefits of a wind farm be to the community in which it is located?

Some of the potential benefits to the community include:

- **Employment—construction:** Local contractors are typically best-positioned to win the road building, excavation, and gravel/concrete hauling and supply contracts for construction of a wind farm. Local ironworkers will be hired to install the re-bar in the tower foundations, and local electricians will be hired to install the miles of underground electrical cable that connect the wind generators.
- **Employment—operating:** Typically a 300 MW wind farm will require about 12 to 18 full-time employees to operate and maintain the facility, with larger projects requiring proportionately more workers. Most of these positions will be for “windsmiths” who operate, repair and maintain the wind turbine generators; the electrical and mechanical skills required for these positions are usually commonplace in farming communities, so local workers are usually hired and trained to fill them. The project manager and support staff are usually also local residents.
- **Tax base:** Some type of payment or gift in lieu of taxes to the community within which the wind farm is located. At \$5,000/MW, a 300 MW wind farm will provide the local tax jurisdictions with \$1,500,000 of new tax revenue. This addition to the local tax base can help pay for more municipal or educational services, reduce real property tax rates, or kept in a reserve fund.
- **Lease income:** With annual lease payments to landowners typically in the range of \$3,000 to \$6,000 per wind turbine tower, a 300 MW wind farm will inject up to \$1,500,000 of additional income into the local economy. Since most wind farms are usually installed on conventional farmland, these rental payments may help to bolster the local agricultural economy.
- **Tourism:** Experience with operating wind projects elsewhere in New York suggest that a wind farm could generate tourism as people visit the area to see the wind turbines, particularly when they are first constructed. In this case, a wind farm could be seen as a good fit with the idea of Tug Hill as a working farm and forest landscape.

There are other possible benefits that fall into a different category than those listed above, as they raise complicated issues and would require much thought and energy to make reality. However, it is worth mentioning here that:

- **Energy costs:** It may be possible for lower-cost electricity to be provided to the community; however, this may be complicated and it is not certain yet that it could be done. As discussed above, since the electric energy generated by wind projects in New York is usually sold into the wholesale electric market, at the hourly price set by the New York Independent System Operator, in the short run these projects will not have any impact on local electric costs. However, it is theoretically possible for a Tug Hill wind farm to sell its electric output to either a local electric utility, or a local energy services company (ESCO), passing along any economic benefits to customers of those companies. Under current market conditions, with higher-cost natural gas increasing the price of electric energy to five to seven cents per kWh, the ability of

wind projects to generate energy in the range of four and-one-half cents per kWh (fixed over 20 years) offers the promise of savings to ratepayers.

- **Water pumping:** The possibility may also exist to attach one or several wind turbines to a municipal function, such as pumping water for a municipal system. Water could be pumped into storage tanks when the wind is blowing and cheaper electricity from the turbine is available. It may also be possible to devise a system where some electricity was sold to the grid and some electricity was tied to a municipal function, but this would likely be a difficult and complicated arrangement.

What arrangements are made with landowners?

Lease arrangements are made with landowners on whose land the towers are to be located. On Tug Hill they will likely be located on agricultural land. A 200-500 acre farm would likely accommodate about 4 to 8 MW-scale wind turbine towers, which would generate between 4 and 12 MW. According to the developers, 2-3% of the gross revenue generated by each individual wind turbine would be annually paid to the landowner as a lease payment, but this is negotiated in the lease agreement with the developer. The annual lease payment per wind turbine is estimated by developers to fall in the \$4,000 to \$6,000 range. Most of the land, or about 98% of the surface area, is still available for farming. Land that would not be available for continued farming is that acreage occupied by access roads, the tower base, and accompanying equipment.

How many landowners would this affect?

The developers would likely need to lease land from approximately 50 landowners to accommodate the approximately 168 towers needed for a 300 MW project. Assuming an annual lease payment of \$5,000 per wind turbine, total annual lease payments to an individual farmer would likely be between \$25,000 and \$50,000, or more. A 300 MW project might bring in \$1,500,000 in total annual revenue to farmers. That amount of money could have a large effect on stabilizing farming in those areas.

Will the value of properties adjacent to the wind farm be affected?

The Renewable Energy Policy Project just published a study showing that wind farms have not had a negative impact on neighboring property values (For more information, see “Wind Development and Property Values” at www.repp.org). It is unknown what affect wind farms in the towns of Madison and Fenner, Madison County, New York, have had on property values of adjoining parcels.

What kind of liability concerns would landowners with wind turbines on their property have?



Wind turbines in Searsburg, Vermont. Note ice on trees. Photo by Charlotte Abrams.

The lease outline Flat Rock has proposed as a model for the agreement they would make with landowners states that the tenant (company) would maintain a specified level of liability and property insurance, with the landowner's name on the policy. The lease also states that the tenant indemnifies and holds harmless the landowner from any liability or losses resulting from the company's equipment. These are issues that should be addressed by a lease with any company, and the landowner would likely want to have their own attorney review any documents before they are signed. In addition, a landowner may want to consider reviewing his/her own liability and property insurance to assess whether coverage is adequate.

Another potential problem that was highlighted on a field trip to the wind energy facility in Searsburg, VT was icing events and the potential safety concerns they raise. At the time a group of local government officials from Tug Hill visited the facility, the area had experienced a relatively major icing event. The group was required to wear hard hats while visiting the site, as the wind turbines will shed the ice as they rotate, reportedly sending ice flying as far as 300 feet. The wind turbines in Searsburg are approximately half the size of those being proposed for Tug Hill, so any installed here could be expected to shed ice even further. This may be a concern where snowmobile trails or winter farm operations might be located close to a wind turbine or series of wind turbines. However, the Searsburg towers are at 2500 feet above mean sea level (msl), whereas in Harrisburg towers would be located at approximately 1700 feet above msl. This may make icing events less frequent and less severe here than in Searsburg.

Flat Rock states that its land lease makes it liable for any possible icing problems. The turbines will have ice detectors on top of the nacelle, and ice on the blade will cause unbalance, and the machine will shut down

What public reviews would be done on a wind farm project?

Several agencies may have a review function: NYS Department of Environmental Conservation, NYS Public Service Commission, Federal Aviation Administration, the U.S. Army Corps of Engineers and others that may be identified in the project review process. All of these agencies and their roles are discussed throughout this paper, but it is



Wind turbine in Town of Fenner.

important to highlight the fact that local concerns (for example, setbacks from roads and property lines) might only be addressed by local laws.

In 2002 the state Legislature passed a law (Chapter 252 of the 2002 Session Laws) that exempts wind generation facilities in Lewis County from the definition of a "major electric generating facility" under NYS Public Service Law Article X. This means that the Flat Rock project does not need to obtain a "certificate of environmental compatibility and public need" issued by the Public Service Commission. The project is, however, subject to the State Environmental Quality Review Act (SEQRA).

Will a new power line be needed?

Yes. As previously mentioned, Flat Rock has applied to the NYS Public Service Committee under Article VII of the NY Public Service Law to build a 10.3-mile power line through the towns of Martinsburg and Watson that will connect with a 230 kV Niagara Mohawk transmission line. The new line will provide greater capacity for the larger project to output more power.

What agencies would be involved in permitting a new power line and/or a wind farm?

The New York State Public Service Commission (PSC) requires that a major utility transmission facility obtain a "certificate of environmental compatibility and public need" issued by the PSC (Article VII of the New York State Public Service law). A major utility transmission facility is defined as "an electric transmission line of a design capacity of 125 kV or more extending a distance of one mile or more, or of 100kV or more and less than 125kV extending a distance of ten miles or more." Flat Rock's proposed transmission line will be approximately 10.3 miles long, therefore triggering Article VII. Flat Rock filed a "certificate of environmental compatibility and public need" with the PSC on March 28, 2003.

The PSC also requires that any "major electric generating facility" defined as having a capacity of 80 MW or more, obtain a "certificate of environmental compatibility and public need" issued by the PSC (Article X of the NYS Public Service law). However, as mentioned earlier the state passed legislation in 2002 that specifies the term "major electric generating facility" does not include wind generation facilities over 80 MW in Lewis County. Therefore the Flat Rock project does not need to obtain a certificate of

environmental compatibility from the PSC, but will be subject to the State Environmental Quality Review Act (SEQR).

Through SEQR, it is anticipated that the three towns in which turbines will be located will do a coordinated environmental review, with the Town of Martinsburg Town Board designated lead agency, as it will contain the highest number of turbines within its boundaries. Flat Rock anticipates submitting their revised SEQR application on or around November 15, 2003, and plans to prepare a Full Environmental Impact Statement (EIS).

Will eminent domain be used to acquire rights-of-way for installation?

Under New York State Transportation Corporations Law Article 2 Section 11, “an electric corporation ... shall have power and authority to acquire such real estate as may be necessary for its corporate purposes and the right of way through any property in the manner prescribed by the eminent domain procedure law.” The corporation looking to invoke eminent domain must obtain a certificate of the PSC certifying that the right sought to be acquired is necessary and in the public interest, so there will be PSC review of the project if eminent domain is sought. Additionally, eminent domain procedure law has a public hearing requirement.

In the case of the Flat Rock project, installation is only occurring on property owned by willing landowners.

What might the Department of Environmental Conservation’s (DEC) involvement be?

If construction of a wind turbine or transmission line were to impact a DEC regulated stream or wetland, the developer would be required to obtain a permit from DEC. It is likely that the developers siting a wind turbine would try to avoid any sensitive areas, but installation of a transmission line is more likely to run into a situation where a permit is needed.

Will wind farm projects require local review?

In Martinsburg, Harrisburg, and Lowville, local land use law requires approvals for wind projects that will trigger the State Environmental Quality Review Act (SEQRA).

In Harrisburg, the local law adds Wind Power Generating Facilities as a “Special Permitted Use” in AR-1 districts (agriculture) and as a “Not Permitted Use” in the RFC (river front corridor) and H-1 (highway) districts. A “Special Permitted Use” would require action by the planning board. An environmental assessment would be necessary as part of the special permit process.

The Martinsburg Development Law states that wind power generating facilities are permitted by special permit in a Wind Power Overlay district (WPO). A WPO district may be applied in the Rural Residential District, Agricultural District or the Forest District upon application to the town board. Once a WPO has been adopted, an approved Special Use permit is required by the planning board.

Lowville zoning law was amended in 2002 to allow wind power generating facilities in zones OC (open space and conservation), AG (agriculture), I-1 (industrial), I-2 (highway industrial), and I-3 (industrial/commerce) upon the completion and approval of a special permit application.

The Tug Hill Commission does not know of any other Tug Hill communities who address wind turbines in their land use laws. Since many local concerns might only be addressed by local law, it is important for communities to consider if they want to have local review of proposed projects.

What are some of the environmental impacts?

Wind turbine construction and operation can impact wildlife, particularly in the form of bird strikes. Any tall structure increases the chance of birds flying into it, but lighted towers at night can cause unique problems. According to research done on the topic, on an overcast night with a lit tower, birds can be drawn into the lit area surrounding the tower. They will then fly in circles to stay in the light, as birds resist flying from light into dark. This increases their chances of hitting the tower or blades. This may be of particular concern in migratory pathways. However, the bird strike issue is likely a larger concern for telecommunications towers and television antennas, which are taller and usually have guy wires. The increased height puts the tower closer to the elevation at which migrating birds would likely fly, and the guy wires increase the odds of the birds hitting something. In general, the Erickson report (that can be accessed on www.nationalwind.org), found that the average collision rate was two collisions per turbine per year. Flat Rock has performed an avian study in the project area, where the primary bird species of concern are the Northern Harrier, Vesper Sparrow, and Horned Lark. The study concluded that in general these birds should not be impacted. Turbines along Rowsam Road were dropped from the project, however, as the avian consultant felt there was a high likelihood of impacting interior forest birds in that area.

Visual impacts are also important to consider in an environmental assessment. In Madison County the environmental assessment conducted by the sponsors looked carefully at whether the towers would be able to be seen from any historical structures or from major highways. Other sites that might be visually sensitive to a wind farm are state forest lands, state or county parks, designated scenic roads or scenic rivers. The New York State Office of Parks, Recreation, and Historic Preservation may be consulted on visual impacts to historical structures. Flat Rock has already conducted an extensive visual impact assessment of the project's local visual impacts, including numerous computer-generated view simulations. Flat Rock anticipates having to do some

mitigation of visual impacts from historical structures, and may be in the position of offering funds for rehabilitation of historic buildings in the Lewis County area.

Noise created by the spinning rotors is also an environmental consideration. The Madison County project hired an outside consultant to do a noise assessment, who found that noise from wind turbines is low enough to correspond to a very quiet rural classification. On field trips to wind energy facilities in Searsburg, VT, and Madison County, where local people stood near operating turbines, noise did not generally seem to be a problem or issue. Generally, wind farm sponsors seek to keep the sound profile of the turbines at or below 50 decibels (dB) at the nearest residential neighbor 95% of the time (for reference, 15 dB is the sound of a whisper, 60 dB is the sound of normal conversation, and a lawnmower is 90 dB). Turbine selection and setback distances are the key factors in determining local sound impacts. For example, Flat Rock has designed the turbine layout plan to meet a 1,250-foot minimum setback distance from the nearest non-participating project neighbor.

As mentioned previously, impacts to DEC regulated wetlands and streams are also environmental considerations, but are relatively easy to avoid with careful siting.

What are tower safety requirements?

Local laws that address wind towers often require setbacks from the road, property lines, and/or structures. In Harrisburg, local law requires all wind power generating facilities to be located at least 100 feet plus the height of the structure from road lines, and side and rear lot lines. In Martinsburg, the setback from the road centerline is 100 feet plus the height of structure, setback from side and rear lot lines is 300 feet, and setback from any existing residential structures is 1500 feet. In Lowville, local law requires a set back of 250 feet from any lot line.

How will the towers be lit?

The Federal Aviation Administration (FAA) regulates obstruction lighting for any towers 200 feet or greater. The general procedure for making decisions on the lighting of towers is for the developer to initially to complete a FAA form giving notice of proposed construction. Along with that form the developers are required to submit a site plan with elevation information. That application is sent to the appropriate region (FAA Eastern Region for Tug Hill), which reviews the application, distributes it to other departments within FAA, and consults with other organizations if necessary (for example, the Department of Defense). A determination would then be made as to what marking and lighting would be required on the turbines.

Wind farms are relatively new in the United States, and the FAA has not established specific guidelines for marking and lighting them on the national level yet. At this point decisions are being made region by region, and there is room for discussion and

compromise. However, concerns and ideas should be brought up at the beginning of the decision procedure, to make sure everything is addressed.

At the time the developer submits the initial form to the FAA, the developer has the opportunity to request what type of lighting system it would prefer. This could be a good opportunity for communities to suggest a preferred lighting arrangement. Additionally, the possibility of modification to the standard lighting systems proposed by FAA exists where such modifications would not impair aviation safety.

According to personnel at the FAA, a possible lighting system for a wind farm might be a dual lighting system, with constant (non-blinking) red lights at night and medium intensity flashing white lights for daytime and twilight use. This lighting system may be used in lieu of operating a medium intensity flashing white lighting system at night. Additionally, a section of FAA's Obstruction Marking and Lighting manual states that a FAA aeronautical study may recommend fewer lights at locations where several structures are closely grouped.

At the Fenner (NY) wind project, seven of the 20 towers have a white daytime-only strobe light, and all of them have night-time only red lights that flash on-and-off independently. The Madison site has medium-density white strobe lights on the top of the tower of each of the 7 turbines, with nighttime red lights that flash on-and-off simultaneously. It is possible that the FAA could require lights on each tower, if the developer, municipality, and other concerned parties do not communicate well with FAA at the beginning. The preliminary indication from the FAA is that each of the Flat Rock wind towers is expected to have nighttime red lights flashing simultaneously, given the proximity of the project to the low-altitude military aircraft training areas.

What provisions are made to ensure that wind turbines will be removed if/when the developer goes out of business or otherwise abandons the site?

The lease outline provided by Flat Rock states that the turbine owner is obligated to remove any wind turbine generators that have not been in operation or generating electricity for a period of 12 months, and to remove any improvements made to the premises within 6 months of the end of the lease. In a worse case scenario, where the tower and all equipment were permanently abandoned, money from salvaging the materials would likely at least cover most or all of the costs of removal.

Additional References

For more information, check out these websites:

American Wind Energy Association

www.awea.org

Atlantic Renewable Energy Corporation
www.atlantic-renewable.com

Zilkha Renewable Energy
www.Zilkha.com

Flat Rock Wind Power Project
www.flatrockwind.com

Fenner Wind Power Project
www.fennerwind.com

Madison Windpower Project
www.purewind.net/madisonsite.html

National Wind Coordinating Committee
www.nationalwind.org

New York State Energy Research and Development Authority (NYSERDA)
www.nyserda.org

New York State Public Service Commission
www.dps.state.ny.us/