

## EXECUTIVE SUMMARY

Groton Wind LLC submits this Application to the New Hampshire Site Evaluation Committee (SEC) for a Certificate of Site and Facility to construct and operate the Groton Wind Project in Groton, New Hampshire. This executive summary provides information summarizing the contents of the application and its appendices, including information about the applicant, the site, the proposed facility, potential social and environmental impacts, and proposed mitigation.

### Applicant information

Groton Wind LLC, a Delaware Limited Liability Company registered to do business in New Hampshire with the New Hampshire Secretary of State, proposes to develop the Groton Wind Project in the Town of Groton, Grafton County, New Hampshire. Groton Wind, LLC is a limited liability company organized for the development and ownership of this Project. It is 100% owned by Iberdrola Renewables, Inc. (IBR). IBR's parent company is Iberdrola Renovables, a publicly traded company on the Madrid stock exchange and the largest owner and operator of renewable energy projects in the world. Iberdrola Renovables is, in turn, 80% owned by Iberdrola, SA, the second largest integrated utility company in Spain engaged in the generation, transmission, distribution and marketing of electricity and natural gas. Iberdrola, with over 10,700 MW of wind power, is the world leader in wind power generation.

Iberdrola Renewables, Inc has over 3,591 MW of installed wind power capacity in the United States as of February, 2010 and has successfully financed, constructed and operated 40 wind energy facilities in 23 states in the United States, including the Lempster Wind Project in New Hampshire. This extensive experience in wind energy ownership, construction, operation, and management will allow it to provide superior financial, managerial, and technical capabilities to assure construction and operation of the Groton Wind Project.

Iberdrola will arrange for the financing of the Groton Wind Project through various potential structures to provide the expected \$120 million in capital for construction, equipment and operation of the Project.

Iberdrola brings three critical aspects to this application and the proposed Project: (1) National and international technical experience and financial resources as the largest wind energy producer in the world; (2) An extensive process of community involvement and outreach in Groton, neighboring towns, regional organizations, and state and local agencies and leaders. This outreach has involved many hundreds of NH citizens, discussing the Project in public meetings, many question and answer sessions, and visits to the Lempster Wind Farm; (3) Iberdrola's track record in New Hampshire through the successful development, construction, and operation of the Lempster Wind Farm, the state's first commercial wind farm.

These three critical aspects provide certainty in the company's capabilities and professionalism, a widespread vetting of the proposal to the host and neighboring

communities, and a recent, successful example of Iberdrola's comprehensive approach to wind farm development and operation in New Hampshire.

### Site information

The proposed Groton Wind Project is situated along two ridge features in the town of Groton, New Hampshire in Grafton County. The area consists of two distinct ridgeline features known as Tenney Mountain and Fletcher Mountain, which are separated by a valley known as Groton Hollow. Both ridges are northeast/southwest oriented and range in peak elevation from 1,850 to 2,300 feet. The site is rural and remote, located on private land parcels that are set back from residences, roads and other public areas.

### Renewable energy facility information

The Project consists of 24 modern 2.0 megawatt (MW) class wind turbines which will be situated along the ridge features described above. The project will provide a total installed capacity of 48MW and is predicted to produce between 144,000 and 158,000 MW hours of electricity per year. This could power between 19,000-21,000 homes on average, and up to 57,000 New Hampshire homes during periods of peak production.

Twelve (12) turbines would be oriented generally in a north-south direction along the Tenney Ridge. Six (6) turbines would be similarly oriented on the southern knob of Fletcher Mountain and six (6) additional turbines on the northwest knob of Fletcher Mountain. The Project site would be accessible from the existing Groton Hollow Road. Access roads within the Project area will follow a central, existing logging road from Groton Hollow Road, and then would use other existing logging roads, skidder trails, and landings where possible to access turbine locations. An Operations and Maintenance (O&M) building and electrical switchyard are proposed to be located within the Project area, in a site located off the existing central logging road.

The Project has had extensive and ongoing discussions with Public Service of New Hampshire (PSNH) and the New Hampshire Electric Cooperative (NHEC) regarding interconnection of the Project. The Project proposes to interconnect with NHEC at the distribution voltage level, 34.5 kV. NHEC will construct a line from the Project to the PSNH Beebe River Substation near Compton Hollow, New Hampshire. This line will be a dedicated 34.5 kV line which will run from the Project along the existing distribution system of the NHEC, an approximately 13.0 mile route. Some improvements and upgrades to the Beebe River Substation and to existing NHEC poles will be required.

Construction is currently planned to start in late 2010 beginning with access roads. Depending on winter and mud season conditions, construction will continue with turbine foundations, crane pads, turbine erection, electrical collection systems, an operations and maintenance building and a permanent meteorological tower. The expected Commercial Operation Date is December 2011.

## Site alternatives analysis

Based on Iberdrola Renewables' extensive experience in developing wind projects throughout the United States, Europe, and Central America, in combination with guidelines established by the National Wind Coordinating Committee, the American Wind Energy Association and the European Wind Energy Association, Iberdrola has developed a comprehensive and practical methodology for selecting wind project sites. This selection process indicates that the Groton Wind Project offers excellent potential for wind resources, environmental appropriateness and community acceptance.

The on-site alternatives analysis included a number of different potential turbine layouts, road configurations, electrical collector system designs, wind turbine types, and various potential locations for the O&M building, switchyard, and construction staging areas. Four primary alternatives were evaluated: a larger Project size, different interconnection points, different turbine types and alternative road layouts.

## Potential environmental impacts and proposed mitigation measures

### Visual impacts

A Visual Impact Assessment (VIA) study concluded that the proposed Project is likely to be visible from only a small portion of the visual study area. However, it will be visible from several identified public resources, (including roads which were the primary source of views), and it will be slightly visible along with the southern and western shores of Newfound Lake. Visual simulations indicated that the Project's overall contrast with the visual/aesthetic character of the area will generally be moderate. Based on experience with currently operating wind power projects elsewhere, public reaction to the Project is likely to be highly variable based on viewer proximity to the turbines, the affected landscape, and the viewer's personal attitude regarding wind power.

Proposed mitigation measures include turbine design and operation to limit visual impact, minimizing FAA lighting, utilizing existing forest roads where feasible, minimizing forest clearing, and rebuilding existing electrical distribution lines rather than build entirely new ones.

### Shadow flicker

Predicted shadow flicker impacts of the Project were calculated using *WindPRO 2.6 Basis* software, and associated shadow module under a "worst case" scenario. The results of the analysis indicated that of the 207 structures evaluated in this study, 98.5% will experience no shadow flicker, 0.5% may be affected less than 1 hr/yr, 2 (1%) may be affected 1-3 hrs/yr, and none will be affected more than 3 hrs/yr. These already very low predicted levels of shadow flicker do not take into account landscape features that will further reduce shadow flicker, therefore predicted levels are almost certainly higher than the actual level that may be experienced.

### FAA lights

It is proposed that FAA required synchronized red pulsing lights will be placed on 11 of the 24 turbines at Groton Wind. The significance of lighting impacts from a given viewpoint will depend on the exact number of lights visible, what other sources of lighting are present in the view, the extent of screening provided by structures and trees, and nighttime viewer activity/sensitivity. It is possible that the synchronized pulsing of the red FAA warning lights on the turbines (where visible) could have an adverse effect on rural residents and vacationers that currently experience very dark nighttime skies in the immediate Project area. It should be noted, however, that nighttime visibility/visual impact will be limited by the abundance of mature trees that screen the Project from many homes, and the concentration of residences in town centers and along highways where existing lights already compromise dark skies and compete for viewer attention. In addition, there are existing lighted communications towers in the area, including on Tenney Mountain, and a new cell tower is planned in Groton.

To mitigate for any potential visual affect, Groton Wind will use lights that pulse 20 times per minute and have a vertical beam spread of 3 degrees which is the lowest amount allowed by the FAA. This means that there will be more "dark space" between flashes and less ground scatter or "light noise" because less of the light from the beam reaches the ground.

### Historic sites

A Phase IA archaeological survey provided an initial review of the Project to assess areas of archaeological sensitivity and potential resource management issues. As recommended by NH DHR, a Phase IB archaeological survey of the area associated with ground disturbance will be performed in summer 2010 to identify archaeological resources that could be affected by project construction. The Phase 1B information will provide the basis for determining the need for further work or mitigation.

The historic architectural survey has identified those historic properties listed on the National and State Registers of Historic Places within 3 miles of the project for visual effects or viewshed. The preliminary perspective of the historic architectural survey suggests that a number of potentially National Register-eligible properties may be located in the Project's area of potential effects (defined by the three-mile viewshed). Thus, the nature and extent of potential visual impacts of the proposed Project on historic buildings, structures and/or districts is still under review. No buildings or structures are proposed to be acquired, physically altered or removed by the Project, and thus impacts, if any, would be limited to those resulting from the visibility of the Project from the historic property.

### Air quality

The Groton Wind Project will not combust any fuels to produce electricity and therefore will not create any air emissions or have an adverse impact on air quality. Moreover, as a source of clean, renewable energy, the Project will add a new power supply to the region without adding any new air pollutant or greenhouse gas emissions. It will positively contribute to regional air quality during those times when its operation is displacing generation from fossil fuel electricity plants.

The long-term environmental and public health problems associated with fossil-fueled power plant air emissions are severe and the statistics are compelling. Wind energy does not add to those problems and, in fact, can be a significant part of the solution. The Project's positive effects with respect to air quality should therefore be given significant consideration when balancing the issues of new facility siting, environmental protection and public health.

### **Water quality**

There are no named lakes or ponds within this 4,180 acre study area, and most drainages are small headwater streams that are intermittent and/or ephemeral in nature. Clark Brook is the only named brook and is the most significant surface water resource in the study area. Clark Brook is a high energy perennial stream with many large boulders, pools, riffles and small waterfalls, all providing habitat for brook trout. Proposed road improvements to Groton Hollow Road will have an impact on Clark Brook in locations where stream crossings will be upgraded and/or where the alteration of terrain is within close proximity to the Brook. Improvements to existing culverts on Groton Hollow Road to meet current NHDES standards are expected to have a long-term positive impact on Clark Brook.

While Clark Brook is not an impaired water body, it flows into the Baker River, which is listed in the impaired waters data base for the following: *Escherichia coli*, dissolved oxygen saturation; dissolved oxygen; pH; chloride; fish bioassessments; benthic bioassessments and mercury. The mercury is due to atmospheric deposits. The proposed Groton Wind Project is not expected to be a source of *E. coli*, mercury or any other pollutant, and therefore will not unreasonably affect water quality in that regard. Moreover, a greater reliance on wind energy has the positive, long term potential to assist in improving water quality by reducing the reliance on energy sources that release mercury into the atmosphere.

Improvement plans for Groton Hollow Road were developed with the goal of minimizing any removal of the existing riparian buffer on along Clark Brook and locating any of the road improvements as far away from the Brook as possible. There should be no long term impacts to water quality and/or temperature in Clark Brook as a result of the Project. Short term effects due to alteration of terrain have been minimized throughout the design of the project and are detailed in the Project design plans and the Alteration of Terrain Application. Frequent monitoring of the performance of such devices will occur and corrective actions will be employed if necessary.

### **Stormwater, soil erosion and sediment control**

The proposed Project will involve construction of approximately 9.3 miles of new gravel road and improvements to approximately 2.4 miles of existing gravel road, as well as the construction of the infrastructure for the support of the Project (turbine foundations, crane pads, material storage areas and operation & maintenance facilities), for a total estimated disturbance area of approximately 116 acres out of 4,180 acres. The Project has been designed to minimize changes to natural flow paths, to minimize impacts on the existing hydrology patterns, minimize erosive forces and to retain favorable conditions for localized treatment of stormwater. Post-construction impacts are generally related to the intensity of

use and thus the very low intensity of use of the proposed features (travel by maintenance personnel), combined with low generation of surface water runoff, is anticipated to have minimal adverse effect on receiving waters.

The Project will not significantly change the peak stormwater runoff discharge rates between the pre and post development conditions for the 2, 10, and 50 year storm events. The Project proposes to minimize surface water and stormwater runoff impacts by maintaining natural drainage patterns where possible through the use of culverts and subsurface stone drainage ways. Design measures to protect surface water quality during construction of the Project have focused on erosion control through use of sediment barriers and soil stabilization measures (erosion control blankets, spray-on polymer emulsions, and prompt stabilization of exposed surfaces). Riprap aprons will be installed at the outlet end of proposed circular culverts to minimize the potential for erosion.

### Wetlands

Wetlands within a 425-acre study area along the proposed corridor alignment were delineated by NH Certified Wetland Scientists. Despite the size and linear nature of the Project, careful design will result in unavoidable permanent impacts to only about 1.63 acres of wetlands and streams and 0.33 acres of temporary impacts. Nearly all of the wetland impacts are related to the construction of the access roads to and along the ridgelines. About 0.3 acre of impact will result from the upgrading of the private portion of Groton Hollow Road. One of the most common impacts involves crossings of the numerous narrow forested drainages on the side slopes of Tenney and Fletcher Mountains.

The Project's engineers have made design changes to avoid and minimize wetland impacts where possible. The proposed location of the turbines on ridge lines avoids impacts to some of the larger forested wetland complexes and perennial streams located in the valleys, which are some of the most ecologically important wetlands on the Project site. New access roads have been located to avoid wetlands entirely or to cross wetlands at or near their narrowest points if they cannot be avoided. The width of access roads has been limited to the minimum required for construction access and safety. The roadway design uses sideslopes of 1:2 in rock cuts and 1.5:1 constructed stone slopes to further minimize slope impacts (1.5:1 slopes are the steepest non-mechanically stabilized earth slopes practical).

The central feature of the wetland mitigation proposal is the Applicant's proposed collaboration with the Society for the Protection of NH Forests (the Forest Society) to assist in their effort to protect up to 6,578 acres owned by Green Acres Woodlands, a private timberland company, in Groton, Hebron, Rumney, Dorchester and Plymouth. Under a proposed conservation easement, the land would continue to be privately owned and managed for forest products, but could never be subdivided or developed. Groton Wind proposes to provide valuable, comprehensive property survey data, GIS layers for environmental and habitat resources, and to assist in the endowment of the conservation easement stewardship fund. In addition, mitigation measures include upgrading more than two dozen stream crossings along Groton Hollow Road to meet current DES standards, which will benefit riparian conditions in the Clark Brook watershed. The existing undersized stream

culverts have an impact on the stream hydrology because their small size increases the likelihood of obstructing fish passage, ponding upstream and erosion and sedimentation downstream.

## Natural environment

Based on aerial imagery it is evident that, even with extensive logging, the site remains primarily forested. However, due to the ongoing commercial logging, the pattern of forest canopy is continuously changing. Five communities are located within the Project boundary: Northern Hardwood Conifer Forests; Wet Meadow-Shrub Wetlands; Rocky Ridges & Talus Slopes; Lowland Spruce-Fir Forests; and Hemlock-Hardwood-Pine Forests.

## Birds

Iberdrola Renewables has implemented a corporate Avian and Bat Protection Plan (ABPP). This is the wind industry's first and only company-wide Avian and Bat Protection Plan and was released in conjunction with the USFWS in October 2008. Iberdrola Renewables' ABPP plan is modeled in part after the 2005 Avian Protection Plan template developed by approximately 30 electric utility companies, numerous electric cooperatives and rural utilities, and the USFWS to address impacts of transmission and distribution lines on birds. A project specific ABPP will be created for the Project and implemented according to the corporate ABPP.

A variety of bird field surveys were conducted within the Project area over the course of three years: 2006, 2008, and 2009. All of these surveys were conducted to inform Groton Wind and State and Federal agencies of potential effects on birds as a result of the construction and operation of the Project so that the Project could be designed in a manner that would minimize potential impacts to birds. Data collected during these surveys was used in combination with information gained through literature review in the risk assessment to provide insight for the Project's potential impacts on birds.

Rare, threatened, or endangered bird species that were documented in the Project area during these surveys include peregrine falcon (state-listed threatened), bald eagle (state-listed threatened), and common loon (state-listed threatened). None of these species reside within the project area. No federally-listed threatened or endangered birds were observed during any of the field surveys.

### *Nocturnal migration*

Overall, results of radar surveys suggest that migration patterns of nocturnal migrants are similar between fall and spring, and that flight height is particularly consistent. Furthermore, the pre-construction radar survey results at the Project were very similar to the only operational project in New Hampshire, the Lempster Wind Project.

Spring and fall passage rates were consistently higher at the Lempster Wind Project than the Groton Wind Project, but the more significant result of the comparison is that the trends in flight heights between sites were nearly identical for a spring migration season. Post

construction monitoring studies conducted at the Lempster Wind Project in 2009 showed very low mortality for nocturnally migrating birds.

The results of the Bird and Bat Risk Assessment, which followed a standardized weight of evidence approach and included a detailed information review as well as incorporated the results of on-site field surveys, predicted a low magnitude of potential impact to nocturnal migrants.

#### ***Breeding birds***

In general, species documented in the Project area were typical of the moderate elevation northern hardwood forests that dominate the Project area. Among the most common species were the ovenbird (*Seiurus aurocapillus*), black-throated blue warbler (*Dendroica caerulescens*), hermit thrush (*Catharus guttatus*), and dark-eyed junco (*Junco hyemalis*). No state or federally-listed species were observed during the breeding bird surveys.

Generally, direct and indirect impacts to breeding birds at the Project are expected to be limited to a small amount of collision mortality and slight shifts in the distribution of breeding bird species within the Project area. The results of the Bird and Bat Risk Assessment predict a low magnitude of potential impact to breeding birds.

#### ***Raptor migration***

Species observed most frequently during the spring and fall migration surveys included broad-winged hawk, red-tailed hawk, and turkey vulture. Two state-endangered raptor species were observed during the 2009 field surveys: golden eagle and northern harrier, however, neither occurred in the Project area. Two state-threatened raptor species were observed: peregrine falcon and bald eagle, both of which were observed in the Project area at some point during the survey. An additional observation of a common loon (state-threatened) also occurred within the Project area on one occasion during the spring migration season.

Raptor surveys in summer/early fall documented low to moderate numbers of seasonally local and migrant raptors at locations above the Project area, and relatively high percentages of raptors flying below the height of the proposed turbines. While pre-construction surveys do not necessarily provide sufficient information to predict risk of collision mortality, field surveys do indicate the potential for exposure of raptors to wind turbines at the Project.

Although difficult to compare due to varying levels of survey effort and design, the Groton Wind Project documented passage rates and species composition similar to pre-construction raptor surveys conducted at the now operational Lempster Wind Project. During the first year of post-construction monitoring studies at Lempster in 2009, no raptor fatalities were documented. The results of the Bird and Bat Risk Assessment predict a low magnitude of potential impact to raptors.

#### ***Peregrine use***

The 2006 peregrine falcon surveys were conducted from Rattlesnake Mountain where the peregrine falcon nest failed that year. In 2009, the study design was enhanced and

peregrine use surveys were designed and conducted collectively with NH Audubon. Over the course of the surveys, only four peregrine falcons were observed from each observation location within the Project area with three of four the peregrine falcons observed within the Project boundary.

There has been low documented peregrine falcon mortality at wind projects. The Bird and Bat Risk Assessment predicted a low magnitude of potential impact to raptors, including peregrine falcon.

### **Bats**

On-site field surveys designed to assess bat presence and activity in the Project area consisted of two seasons of summer/fall acoustic monitoring in 2006 and 2009. Additional spring and summer acoustic bat surveys are currently planned for spring and summer 2010. Acoustic surveys conducted in 2006 and again in 2009 documented relatively low bat activity levels at the Project site.

In comparison to similar studies conducted at other proposed wind projects in the northeast, bat activity levels recorded within the Project area were generally low. Fatality rates are expected to be more similar to those found during post-construction studies at Projects in the northeast rather than those in mid-Atlantic states, and are expected to be similar to the Lempster Wind Project. For example, pre-construction studies conducted at the Lempster Wind Project documented similar species composition and detection rates as Groton Wind and post-construction studies demonstrated low fatality estimates

Indirect impacts to bats are expected to be minor at the Project, given the relatively small amount of anticipated clearing and the currently disturbed nature of many habitats within the Project area.

### **Avian and bat mitigation**

After the Project commences operations, Groton Wind is committed to one year of formal post-construction monitoring similar to efforts currently underway at the Lempster project, including searcher efficiency, scavenging removal rates, and habitat analysis. If, after one year of study, the Project's mortality rates are lower or within the range of other Northern Forested wind project locations, Groton Wind will immediately implement yearly monitoring for the life of the Project as described in the Iberdrola Renewables Avian and Bat Protection Plan. If, after the first year of study, Groton Wind's mortality rates exceed the most current established threshold ranges for mortality at wind projects on northern forested ridges, Groton Wind will conduct a second year of post-construction monitoring similar to the first but with an emphasis on determining why mortality rates have exceeded estimated thresholds.

### **Other wildlife**

After discussions with NH F&G and USFWS, a Wildlife Habitat Assessment was conducted on the Project site to address non-avian wildlife habitat issues, including questions relative to the wood turtle, native brook trout and deer wintering yards. In general, the Assessment found that the Project site provides wildlife habitat for a number of species, albeit modified

substantially by the timber harvesting operations that have occurred on this site since the 1940s and earlier. Evidence of well-established wildlife trails indicates both historical and continuing moderate to heavy use by a variety of wildlife species typical of NH forests.

Because the Groton Wind Project will introduce new disturbance and permanent structures to the site, some level of impact to wildlife habitat would likely occur. However, because the Project does not involve any development that will significantly increase traffic to the area or increase use by humans, habitat fragmentation will be relatively minor, and there should not be a substantial change in the patterns of wildlife habitat use and movement around the site.

There are no known state or federally-listed species within the Project limits, nor are there any exemplary natural communities occurring within or in close proximity to the Project area. However, the Natural Heritage Bureau data does indicate there are populations of the wood turtle (*Glyptemys insculpta*) and the peregrine falcon (*Falco peregrines*) in the vicinity of the site. In addition to these two species of concern, and based on verbal communication with the NH F&G, concerns were raised regarding the potential for a native population of brook trout in Clark Brook as well as the potential for deer wintering habitat ("deer yards") on the Project site.

#### ***Wood turtle***

The potential for the occurrence of wood turtle was evaluated in the Wildlife Habitat Assessment. Based on habitat conditions in the Project area, it seems unlikely that any resident population of wood turtle exists on the site and it is concluded that the risk to this species from this Project is negligible.

#### ***Deer wintering habitat***

In general, the Project crosses three potential deer yard areas. However, field assessment provided strong evidence that only one of the three areas is actually used as a yard. This potential deer yard, consisting of an eastern hemlock-spruce cover type, is located on the east side of Groton Hollow Road. It appears that some deer are utilizing this area periodically as a winter yard. Moose sign was also evident suggesting possible co-usage by this mammal during the later winter months. This deer yard's proximity to Groton Hollow Road and orientation on a south east slope (i.e., colder temperatures) may constrain overall yarding activity. Due to this yard's position in the lower valley and away from the proposed wind turbines, it is not expected that this seasonal usage by resident deer will be impacted.

#### ***Eastern brook trout***

Clark Brook and its associated tributaries provide habitat which can support native brook trout including clear and cold water temperatures, riffles, deep pools, a forested canopy, and associated feed sources. Biologists observed brook trout within the Clark Brook mainstem.

Stream sedimentation, if not properly controlled, could impact brook trout habitat during construction. However, as part of this Application, the Project has submitted a plan for temporary and permanent erosion control in connection with the NH Alteration of Terrain permit application. Thus, the risk of substantial erosion and sedimentation will be minimized. Additionally, a large number of sub-standard culverts along Groton Hollow Road will be

replaced with new culverts consistent with guidance from the NH DES on stream crossings. These new crossings will restore stream connectivity in a number of locations which is expected to benefit the cold water fishery.

#### *Vernal pools*

During field investigations of the Project site, eleven (11) vernal pools were identified, delineated and documented. Another six (6) wetlands that have the potential to be vernal pools were identified. The Project has been designed to avoid direct impact to any vernal pools. There are three (3) cases where there are indirect impacts to documented vernal pools. In two cases, the construction of the wind Project would remove some of the forested upland buffer to documented vernal pools. In one case, fill will be placed within a wetland for road improvements but will not directly impact the vernal pool breeding habitat located within the same wetland.

### Public health and safety

Iberdrola Renewables is a responsible renewable energy developer and owner and works very hard to prevent any negative environmental, health or safety impacts to the communities and residents where it constructs and operates its wind farms. Iberdrola Renewables strives to proactively deal with all concerns during the development, siting, permitting and construction process. The company also operates its wind facilities under prudent wind practices. Iberdrola Renewables has received many accolades from communities around the country recognizing the company's good working relationships with these communities and residents to develop, construct, and operate wind plants, and its responsiveness to concerns. As an example of the Iberdrola Renewables' safety record through 2008, Iberdrola Renewables and its predecessor PPM Energy, Inc. (PPM) had just 1 employee "lost time accident" for all company operations in the United States and Canada over the previous 8 years.

Groton Wind will work with local fire departments to notify them of construction plans, provide site visits to review the location of and access to Project facilities and emergency response procedures, and mutual assistance in the case of fire or other emergency in or around the Project area. Groton Wind will establish a 911 address during construction, and work with local responders to identify access points. In addition, Groton Wind and the Town of Groton have an agreement that addresses public health and safety issues. Groton Wind is also working with the Town of Rumney on a similar agreement, and has met with the Rumney Emergency Management Director.

#### **Ice shed**

Icing conditions have been known to occur during certain winter conditions of temperature and precipitation. On all Iberdrola Renewables turbines sited in cold weather climates, nacelle-mounted anemometers are heated and provide accurate wind speed information during all weather conditions. Ice build-up on the blades degrades the airfoil profile and causes a reduction in aerodynamic lift, and thus, a reduction in power, even in adequate wind conditions. The turbine power curve program identifies an inconsistency between the wind

speed, expected power production and RPMs, and automatically switches the turbine into standby mode, thus potential ice shedding does not pose a public safety risk.

Project access roads will have visible signs warning of the danger of potential falling ice.

### **Lightning strikes**

Due to the height of the turbines and their metal/carbon components, lightning strikes can occur. The Gamesa G87 turbines proposed for the Groton Wind Project include lightning protection systems which protect against blade damage. The turbine monitoring system provides documentation of all critical lightning events and if a problem is detected, the turbine will shut down automatically or, at a minimum, be inspected to assure that damage has not occurred.

Iberdrola Renewables has an extensive grounding system installed at all wind farms that includes embedded copper rods. The grounding system typically includes an embedded copper ring at the base of each turbine. Upon completion, there will be an underground collector system that serves to dissipate the effects of lightning.

### **Tower collapse/blade throw**

Groton Wind will construct and operate the Project consistent with its corporate commitment to meeting all applicable state and Federal OSHA safety regulations. In addition to compliance with the design specifications and construction standards noted in section F.5.a, each turbine is certified according to international engineering standards. All electrical equipment will be inspected by Iberdrola Renewables under rigorous commissioning procedures, as well as by the local utilities (for grid and system safety), prior to being brought on line. Once turbines are commissioned, qualified personnel routinely inspect and repair them as necessary pursuant to preventive maintenance schedules. The G87 turbines proposed for the Groton Wind Project have state-of-the-art braking systems, pitch controls, sensors and speed controls that operate to reduce the risk of overspeed which can lead to blade and or tower failure. Additionally, the turbines cease operation if significant vibrations or rotor blade stress is sensed by the blade monitoring system. In the extremely unlikely event that tower collapse or blade failure occur, site personnel would immediately call appropriate local emergency response personnel.

### **Stray voltage**

As discussed above, the Groton Wind Project's collection system will be properly grounded in accordance with national and international standards. In addition, because interconnection lines and switchyards are designed in accordance with local utility regulations, it is unlikely that the Project poses any risk to the public's health or safety as the result of stray voltage.

### **Fire**

In addition to the on-site staff, the Project is continually monitored 24 hours a day 7 days a week by the Iberdrola Renewables Operations Center located in Portland, Oregon. Built-in safety and design systems minimize the chance of fire occurring in the turbines or electrical

equipment. Other applicable fire laws and regulations will be followed in accordance with state and local requirements. The Project has coordinated with both the Groton and Rumney Fire Departments.

### **Aviation safety**

Groton Wind received FAA approvals for turbines in December 2009. At that time, the FAA indicated that 3 or 4 of the proposed turbine locations could pose an aviation hazard. The Project subsequently shifted turbine locations. Due to these turbine location changes since the initial applications in June 2009, the Project re-filed the new locations in February 2010.

FAA requires lighting the Project as one large obstruction with lights spaced approximately 3,000 feet apart. The FAA has determined that the standard turbine color is sufficient daylight marking and therefore white strobe lights will not be required. As a result, wind farms are lit with synchronized red flashing lights at night and only a subset of the turbines are lit. As designed, approximately 11 of the 24 turbines will be lit. The permanent meteorological tower will also be lit in accordance with FAA guidance.

### **Orderly development of the region**

The Project engaged economic experts at the University of New Hampshire to evaluate the potential economic effects of the Project. These studies demonstrate that the Project will not have an unreasonable adverse impact on the orderly development of the region insofar as local land use, the local economy and local employment are concerned. Moreover, the study demonstrates that the Project will have substantial positive effects upon the region's development and economic well-being.

### **Local land use**

The Project's impacts on local land use during construction and operation of the Project are expected to be minimal. The Project Site is used primarily for timber harvesting. Given that the Society for the Protection of NH Forests is working to place a majority of the Project site into a conservation easement, this existing use is expected to continue indefinitely.

### **Local economy**

The Project is estimated to have an estimated regional economic benefit of approximately \$81.5 million over 20 years. The UNH study estimates that during construction, the Project will provide \$24.5 million in local area benefits. The Lempster Wind Project construction and operations have demonstrated the economic benefits that wind farms can bring to New Hampshire. From local restaurants and hotels, to labor and materials, the Lempster Project injected substantial amounts of money into the local economy during construction. The Lempster Wind Project is also a significant source of local revenue to landowners and to the Town of Lempster, providing a substantial amount of the Town's total revenues

Given the results of studies conducted at existing wind farms across the country, it is reasonable to assume that the Groton Wind Project will not have an adverse impact on local property values.

While there are no empirical studies of which the Project is aware which measure regional tourism expenditures before and after a wind farm development, there is considerable evidence that wind projects in a number of U.S. and international sites have become tourism draws, including the Lempster Wind Project and the Green Mountain Power facility in Searsburg, Vermont.

### **Local employment**

The Economic Impact study estimates a total of 229 total local jobs (including direct employment, indirect jobs, and induced jobs) will be created as a result of the Groton Wind Project. These economic benefits include direct expenditures on labor, materials, and services during construction and operations, payments to landowners, and payments to the Town of Groton and State of New Hampshire.

### **Conclusions**

The Groton Wind Project will provide a clean and emission-free source of renewable electricity to help meet the energy needs of the State of New Hampshire, and a new source of revenue for Groton, local landowners, and the State. The proposed site is ideal due to its current use for timber harvesting, existing roads, and the lack of sensitive environmental features.

Iberdrola brings three critical aspects to this application and the proposed Project: (1) National and international technical experience and financial resources as the largest wind energy producer in the world; (2) An extensive process of community involvement and outreach in Groton, neighboring towns, regional organizations, and state and local agencies and leaders. This outreach has involved many hundreds of NH citizens, discussing the Project in public meetings, many question and answer sessions, and visits to the Lempster Wind Farm; (3) Iberdrola's track record in New Hampshire through the successful development, construction, and operation of the Lempster Wind Project, the state's first commercial wind farm.

These three critical aspects provide certainty in the company's capabilities and professionalism, a widespread vetting of the proposal to the host and neighboring communities, and a recent, successful example of Iberdrola's comprehensive approach to wind farm development and operation in New Hampshire.