ANSWERS TO COMMONLY ASKED QUESTIONS
ABOUT KINGDOM COMMUNITY WIND

What is Kingdom Community Wind?
Green Mountain Power partnered with Vermont Electric Cooperative to build 21 wind turbines on Lowell Mountain as a new source of renewable energy in Vermont. The project began generating electricity at the end of 2012.

How much electricity will Kingdom Community Wind produce?
The wind turbines at Kingdom Community Wind are 3 MW VESTAS V112, some of the newest technology on the market. Once fully operational, the plant is expected to produce approximately 186,000 MWH annually or the equivalent of enough electricity to power more than 24,000 homes each year.

Will the power stay in Vermont?
YES! Every single kilowatt hour of electricity will be used by Green Mountain Power and Vermont Electric Cooperative customers. Refer to page 4 to learn about the Renewable Energy Credits (REC).

How will this benefit Vermonters?
Vermonters will benefit from the lowest cost new renewable energy generated in the state by Kingdom Community Wind. As a utility-owned project, we can provide electricity to GMP and VEC more cost effectively than if the project were owned by an outside developer. It is like the difference between renting and owning – GMP's and VEC's customers will reap the long-term value.

How does wind keep pollutants out of the air?
Based on initial estimates for power production, clean energy from KCW will prevent over 74,000 tons of CO2 per year from entering the earth's atmosphere from fossil fuel generating plants. Every megawatt hour that a wind plant generates is a megawatt hour a plant – for the most part fossil fuel fired -- somewhere else in New England does not need to operate.

Why are the turbines sometimes not running?
Wind is variable along the length of the ridge and may cause some turbines at different points along the ridge to spin at different speeds. Sometimes, there just isn't enough wind to turn the blades. In addition, new generation plants, like Kingdom, need adjustments made during the startup phase. While this work is being done, turbines must be shut down. Other reasons why the turbines may not be spinning include: winter operating and noise monitoring and testing protocol; routine 3-month maintenance; and finally, requests from ISO New England for specific output levels. The regional electric system operator balances generation with load across New England. We have experienced periodic curtailment of generation and are working on several different paths to reduce curtailment, including installing a synchronous condenser.

How will GMP decommission the turbines and above-ground infrastructure?
Green Mountain Power has $6.1 million in a protected decommissioning fund. Decommissioning includes, among other things, the requirement that GMP remove all above-ground components and structures associated with the KCW Project and those below ground to a depth of at least 2 feet and transport them off-site for recycling or disposal; and re-grade all areas excavated during decommissioning to provide for permanent soil stabilization and to promote establishment of appropriate vegetation.

Does wind power work?
Absolutely. Wind provides clean, renewable energy when the wind is blowing, and building sites are chosen based on having a good wind resource. The electric grid is designed to accommodate the different operating characteristics of all types of generation – such as nuclear power and large hydro, which run almost all the time, and gas turbines that can be turned on when customer demand is at its highest. Renewable resources, in general, are intermittent, meaning they run when the "fuel" is available, whether it is the sun, water or wind.

As customer demand increases and decreases throughout the day, intermittent resources are easily incorporated into the total operation of the grid. The benefit of wind generation, as well as hydro, solar, and other renewable energy plants, is that when they are producing power, generation from other plants in New England, most often fossil fuel plants, can be reduced.

What is "capacity factor"?
There is some confusion about a wind farm's "capacity factor" and the percent of the time the wind farm is generating electricity. The capacity factor is the ratio of the actual amount of electricity generated during a year divided by the theoretical maximum amount of generation that could be generated during that year. Turbines generate at their full capacity during relatively strong winds, but they still generate electricity during lighter winds, much as the generation of a river-run hydro plant varies with variations in water levels. For example, GMP's Searsburg wind plant generates power about 80 percent of the time while having a capacity factor between 20% and 25%. The capacity factor at KCW is expected to be around 33%.

THE IMPACT OF WIND TURBINES

Why do turbines need to be located along ridgelines?
Winds are stronger and more persistent at higher elevations, and the simple fact is that at lower elevations – even where mountains and other obstructions do not block the wind, the winds are not sufficient to generate economically viable power on a commercial scale.

Will Kingdom Community Wind affect property values?
We know this is an important question to some people who live in Lowell and neighboring communities. The largest and most comprehensive peer reviewed scientific study ever conducted was released in December 2009 and is available on-line at http://emp.lbl.gov/reports/re?page=1. The Lawrence Berkeley National Laboratory analyzed over 7,000 home sales surrounding more than 1,000 modern turbines. It reports "no statistical evidence that homes with a view of wind turbines have different values or appreciation rates than homes without such views." However, it's reasonable to be concerned that there could be isolated cases where some properties values are affected, and, in fact, the study indicates that "though one cannot rule out isolated cases where property values are negatively impacted, any such impacts within our sample are neither widespread nor statistically identifiable."

Do the turbines create sound?
Yes, turbines create sound, but Vermont has strict standards for wind projects that must be adhered to. The standard is 45 db--roughly the noise level of a quiet library. There are free apps available for mobile devices that measure sound – it's worth downloading one to get a sense of what 45 db is like.

Is the sound being monitored?
To assure KCW is staying within the allowed sound levels set forth by the Public Service Board, GMP has adopted a rigorous sound monitoring protocol. During the first two years of operations, four different locations near the wind farm will be monitored for sound four times a year for two-week periods or longer each time. The initial sound monitoring period will be observed by an independent third party sound professional to ensure that sufficient data is obtained and that the data collected accurately captures the sound level of the turbines at each of the monitoring locations.

The data obtained from the monitoring will help GMP confirm our preconstruction modeling of the sound levels around the project and further identify any specific conditions that result in noise above the modeled level, and allow adjustments of the operating practices to ensure compliance with CPG mandated noise limits. Individuals who live in the vicinity of the turbines can report any noise concerns to joanne.heidkamp@greenmountainpower.com or call 1-802-238-5414.

Will sound monitoring include infrasound?
Infrasound is audio frequencies below the level of human hearing. Infrasound commonly occurs in nature from numerous sources including surf, aurora borealis, solar flares, and thunderstorms. After extensive testimony from sound experts, the PSB concluded that the wind turbines are not likely to emit audible or perceivable infrasound. As a result, the Board did not require monitoring for infrasound.

Does the sound produced by wind turbines cause health effects?
More than 50,000 turbines are currently in operation in Europe and more than 30,000 in North America. Most people consider them good neighbors. It is true that some individuals have complained that living near turbines causes adverse health effects due to noise. We are unaware of any objective scientific study to support these claims.

There is nothing unique about the type of noise produced by an operating wind turbine. According to the U.S. Department of Energy, at a distance of 1,140 feet, modern wind turbines can be expected to be about as noisy as a quiet bedroom – 35-40 decibels, which compares to about 40 decibels for a typical rural night-time background. The closest neighbor to KCW is over 3,400 feet away.

Do the turbines have lights?
The Federal Aviation Administration (FAA) requires lights on anything over 200 feet tall. KCW has 8 red LED lights that blink slowly and do not create glare, similar to the ones atop tall buildings and communications towers. We currently have a request in to the FAA to use Obstacle Collision Avoidance System (OCAS) radar. This system, currently used in Europe, would allow the lights to stay off unless aircraft are in the area.

How will the development affect water quality and the environment?
Green Mountain Power worked closely with the Vermont Agency of Natural Resources to ensure the smallest possible impact on water quality and the environment. Water quality in streams in the vicinity of the site will be fully protected during both the construction phase and operational phase of the project. This includes the hydrology, the water chemistry, and the aquatic biota, specifically fish and aquatic insects. The permits establish extremely protective standards and requirements and require extensive monitoring to ensure that this is the case.

How much land was disturbed to build the project?
The land leased for the project has been an active logging operation for decades. Of the thousands of acres that comprise Lowell Mountain a total of 135 acres was used for the wind plant. Direct impact to bear habitat totaled 20 acres, impact to wetlands totaled half an acre, and for high level wetlands the impact was one-tenth of an acre. To mitigate these impacts and the habitat fragmentation caused by the road, GMP procured conservation easements on over 2,800 acres. The conserved area includes over 1,100 acres on Lowell Mountain, and over 1,600 acres in Eden connecting important wildlife corridors between Green River Reservoir and the Lowell wildlife habitat area.

What are you doing to protect bats?
The operation of the turbines will be regulated based on the atmospheric conditions that affect the behavior of bats. These conditions include the time of day, wind speed, and temperature. When bats are active the turbines will pause.

TAX SUBSIDIES AND RENEWABLE ENERGY CREDITS (RECS)

Is wind generation subsidized?
Yes. Wind power receives federal tax incentives based on production and effectiveness. The full amount of these incentives will flow through to VEC and GMP customers by lowering the cost of the energy produced by the project. It is also important to bear in mind that many forms of electric generation enjoy federal and sometimes state tax or other financial incentives. Wind is not unique in this regard.

Who will benefit from federal production tax credits?
Any tax credits will be applied to reduce the cost of power from the project to GMP and VEC customers. Unlike a private developer who can increase earnings through the tax credits, a regulated utility is required to pass along to customers any benefits that reduce the cost of the project. It is estimated the PTC will generate over $40 million dollars. These funds go to lower the cost that GMP customer and VEC members pay.

How do Renewable Energy Credits (RECs) lower the cost of electricity for Vermonters?
The purpose of the REC market is to provide incentives to develop renewable generation, like wind power. In all New England states, except Vermont, utilities need RECs to meet state-mandated renewable energy requirements, and thus increase the amount of renewable energy they can claim. These out-of-state utilities are looking for RECs to purchase. Because of this, and because the Vermont law encourages our utilities to sell their RECs in order to lower the cost of electricity for their customers, it is likely that GMP and VEC will sell the RECs associated with KCW. When considering the REC issue it is important to recognize that GMP and VEC will control the RECs. They can choose to sell them to benefit their respective customers or members, or if the regulatory environment evolves so Vermont utilities are required to have RECs associated with a percentage of the electricity they sell, they can retain any RECs required (as opposed to having to buy them at market prices).

Can I visit the Kingdom Community Wind Farm?
Beginning in 2013, we will be offering limited public tours, to give the community a chance to learn more about Vermont's most abundant renewable resource and the amazing technology we use to harness the wind. To minimize impact to bear habitat, tours will only be available when bears are least active. To learn about tours, contact Gert or Andy Tetreault. 802-744-6664. gert@kingdomcommunitywind.com

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