



Winter Island Wind Frequently Asked Questions

Courtesy of the Salem Renewable Energy Task Force



For more detailed information regarding the questions below, please go to:

www.Salem.com/Pages/SalemMA_BComm/windlinks

Why does the City want to build a wind turbine?

We believe it is the right thing to do for the future. Going forward we will all need to rely on renewable energy generated within our communities. Renewable energy systems must use the resources available where they are located. We have wind here- so we should harness it...for electric power, money, price stability, energy independence, educational benefits...and for our future generations.

Expected net revenue from the proposed 1.5 mW unit: \$170K - \$700K annually

(Up to \$15M over the 30 year expected life)

Energy Cost Stability: The proposed unit will provide energy price stability for 20-50% of Salem's municipal energy use.

Carbon Emissions Reduction: Up to 80,000 tons over 30 year expected life

Will the proposed wind turbine directly benefit Winter Island Park in any way?

The City will need to collectively decide how it chooses to use funds generated from the wind turbine. Mayor Driscoll is committed to allotting some of the funds for Winter Island Master Plan improvements.

But why wind? Were other renewable energy technologies considered as an alternative to onshore wind?

Where wind is available, as it is at this site, it has the best "bang for the buck", particularly with respect to the power it can generate in a given space (for instance solar would need about 8 acres to produce similar energy output). Other renewable sources have been, and will continue to be, evaluated.

Why was the Winter Island site chosen? Couldn't it be somewhere else in the city?

All other City-owned sites were considered, and after 6 years of 3rd party surveys, studies, and detailed wind monitoring (culminating in a comprehensive feasibility study) it was concluded that Winter Island provides the optimal balance between site variables, benefits and impacts, and that *there is no other city-owned site that meets the minimum necessary criteria.*

Please see UMass Renewable Energy Lab report on Salem wind siting considerations:

http://salem.com/Pages/SalemMA_BComm/rerl.pdf

Why not offshore?

Offshore development, particularly the power transmission underwater, is very expensive and only becomes financially viable when multiple units are considered. The reality is that such a project would likely need to be left to independent developers, and outside the City coastal limits, and therefore not benefit the City directly.

What about at the Salem Harbor Power Station?

The City does not own that site and it is likely that it will be a very long time before redevelopment.



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Why does it need to be that tall (260 ft. to top of tower, or “hub height”, and nearly 400 ft. to blade tip), and why can’t we erect several smaller units instead?

The higher you go, the more wind you are able to capture. The more wind- the more energy, the more energy- the more money generated. Standard turbine heights sold are 200, 230 and 260 ft. The cost of two or more units of smaller size to produce the same amount of power is significantly more than one turbine of a larger size. More units would also take more space and more maintenance, and smaller units often lag behind the technology improvements of the larger ones.

How much land-area on Winter Island will the proposed wind turbine make unavailable for public use?

The diameter of the monopole (tower) for the proposed Winter Island turbine will be about 15 feet (180 sq ft). Many turbines have little or no fenced area at their base, including those in Ipswich, Newburyport and Hull, and the ones at the McGlynn School in Medford and the Mass Maritime Academy in Buzzards Bay. The City would not proceed with the project if a fenced-off area of any appreciable size would be required.

What about sound?

Generally, the faster a turbine spins, the greater the sound levels. The winds at Winter Island are typically blowing at their lowest speeds during the daytime and summer months, thus the turbine will be at its quietest when the park is most active. Conversely, the turbine will be spinning fastest at night during the winter when the island is far less active, and when most people have their windows and doors shut.

The turbine manufacturer claims sound levels of about 55 decibels or “dB”¹ at the turbine base, diminishing greatly with distance at a rate of about 5 dB per 300 ft. (55 dB is the sound level of a typical large business office without conversation; conversational sound levels are about 60 – 65 dB). The modeling performed by acoustic experts, taking into account the terrain, the height of the turbine, and the maximum sound generated for the GE example model concluded that at the distance of the Plummer Home (about 1300 ft.) the maximum sound level from the proposed wind turbine would actually be below that of the *measured* nighttime background noise.

Assuming that a Winter Island amphitheater plan is implemented, it will be relatively easy to prevent any sound impact from the turbine by simply shutting off the turbine during amphitheater performances if needed.

What about infrasound and “Wind Turbine Syndrome”?

To date, there is no credible evidence that Wind Turbine Syndrome is a real health condition, nor that infrasound, the lowest frequency range of sound (often inaudible), poses any kind of health risks. There have been a few studies suggesting the existence of the condition; however, these studies have failed to withstand the rigors of scientific scrutiny. By contrast, there is a substantial body of credible evidence indicating that we are routinely exposed to infrasound from many sources in our day to day environment and that this sound does not pose any kind of health risk at the intensity levels at which they typically occur. Furthermore, the level of intensity of infrasound produced by these varied sources is often far above that which wind turbines are capable of producing. For more information, please see http://www.bwea.com/pdf/wind_turbine_syndrome.pdf and <http://www.maine.gov/dhhs/boh/documents/Wind-Turbine-Wisconsin-Assessment.pdf>

¹ Decibels are the standard unit of measure of sound intensity.



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What is shadow flicker, how likely is it to be an impact and can it be avoided?

Shadow flicker is the flickering effect produced as the rotating blades pass by the sun. The feasibility study model predicts shadow flicker would occur for fewer than 20 hours a year with most occurring over Salem Harbor, rather than over residential areas. The remedy for shadow flicker is to simply idle the turbine temporarily if neighbors feel that the flicker impact is too annoying. (Please see page 61 of the Feasibility Study here: http://salem.com/Pages/SalemMA_BComm/windreport.pdf)

Will the turbine need to be lit with a red strobe?

Yes. All structures over 200 ft. in height must have a red beacon per the Federal Aviation Administration. The current stacks at the power plant have several of these lights, and there is no reason to assume that the single strobe required for a wind turbine would create any more significant impact.

What about catastrophic failures such as ice throw, blade throw, fire, or collapse?

These conditions are very rare. Modern wind turbines are fitted with ice monitoring technologies that sense ice buildup and “turn off” the turbine until inspected. In a study that looked at a 31 year period ending in 2006, among thousands of installations worldwide, *there were no injuries or deaths attributable to wind turbine blade throw, either among the general public or wind industry workers*. Typically it would take something in excess of a Category 5 hurricane to blow one of the units over. Further review of the reasons and remedies to avoid catastrophic failures will be completed. But our current understanding is that the risks are low, and the situations that pose risk are the scenarios that would also reduce the likelihood of a public presence on the island.

Will having a wind turbine in my neighborhood affect my property values?

The best studies to date indicate that wind turbines have little (if any) long term effect on property values. Please visit http://www.windpoweringamerica.gov/newengland/filter_detail.asp?itemid=2610 for more information on this topic.

Will birds or bats be impacted?

Studies show that wind turbines pose significantly less risk to birds and bats than many other widely accepted risks such as tall buildings and house cats, which are responsible for annual bird deaths numbering in the hundreds of millions (perhaps billions). The typical single wind turbine of the size contemplated kills fewer than 10 birds per year, and fewer than 20 bats per year. In their position statement on the Cape Wind project, the MA Audubon Society says: “...we conclude that Cape Wind will make a positive contribution to help reduce the worst effects of climate change with no significant ecological threat to the avian and marine life...”.

http://www.massaudubon.org/PDF/capewind/cape_wind_position_20100624.pdf

Are there comparable turbine projects in the area?

Yes. There are existing turbines of similar scale in Ipswich, Hull and Newburyport, with several others being considered in Ipswich, Newburyport, Gloucester, Beverly, Swampscott, and Lynn.



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How will this project be different from others, like Falmouth, that have raised concerns?

First there are 2 turbines in Falmouth in fairly close proximity. The turbines that were installed there were Vestas V82 units that were manufactured in 2005, slated for another project that never materialized, stored in a warehouse for several years, then bought, refurbished and installed under a fast-tracked program. These turbines use older and typically louder “stall-regulation” technology to control the turbines in high wind situations. “Pitch-regulation” is the more favored approach today and is somewhat quieter. Perhaps noteworthy here is that the Vestas units used in Falmouth are no longer sold. The turbine model for the Salem project has not yet been selected. The GE 1.5 mW unit examined in the Feasibility Study is simply a unit of representative size used for analysis purposes.

It is also noteworthy that the background ambient noise in the vicinity of the Falmouth turbines is considerably lower than that in the vicinity of the proposed Salem turbine (at all times—day or night); in other words, it is generally a quieter environment.

What are the next steps?

Now that we know this is a viable site, we want the community to continue to ask questions to guide additional research and to help gauge general public sentiment. *Input from Salem residents is critical at this stage.* The next stage in actual implementation, pending public and City Council approval, would be the Design & Construction phase, for which the City has applied for a \$400,000 state grant. This stage consists of further review of the site considerations for construction purposes, additional studies as needed, review and preparation of all permit applications, seeking bids for a turbine, the final cost analysis and selection process, and then preparation for actual construction. A bond would likely be the financing mechanism for the City, thus an approval by City Council would be needed.

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Please contact City Energy and Sustainability Manager Paul Marquis at pmarquis@salem.com, or 978.619.5693 if you have additional questions or concerns.

