

Noisy Wind and Hot Air

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As well as being about wind turbine noise, this discussion is also about credibility, and the validity of information and the validity of sources. I'm going to address both of these—the noise issue, and how to decide what and who to believe.

With regard to technical studies, *hired consultants are always less credible than university scientists who are free of industry ties*. Take a look at the pharmaceutical industry in this country: because the research on ill effects is done by companies selling the products, ill effects are concealed, and we end up with debacles like the recent one with Vioxx. Noble Environmental quotes in public what their paid consultant, Dr. Leventhall, says about my thoughts on wind turbine sound (or perhaps they just wrote it themselves, since some of the physics, "Synchronization effects can be reduced by running the turbines unsynchronized," is not worthy of a high school student). Dr. van den Berg, a university researcher, replied the following to Noble when they asked him about my March 2 Telegram piece:

"Indeed in the statement the term 'low pitched thumping sound', a description of the sound character, seems to be equated to 'low frequency noise', a technical term relating to a specific frequency range. The results of my investigations have not led to the conclusion that low frequency sound as such (implying sound of frequencies between 1 and approximately 200 Hz) are the likely cause of annoyance from modern wind turbines for most people. However, noise from (tall) wind turbines has not been addressed properly by wind turbine (farm) managers and consultants, and I can understand that residents who have become aware of that feel they have to further their arguments, but get confused by the technical jargon used in acoustics.

"You may use this statement publicly, but only in its entirety." [as I have done here] ¹

¹ GP van den Berg, personal communication, May 2, 2005.

Now let us read the summary of Dr. van den Berg's paper, "Do wind turbines produce significant low frequency sound levels?" presented in August 2004 at the 11th International Meeting on Low Frequency Noise and Vibration and its Control, in which his answer is yes, they do, and this sound is significant, though its effect is indirect:

"Wind turbines produce low frequency sounds, but it has not been shown this is a major factor contributing to annoyance. Sound from wind turbines involves several sound production mechanisms related to different interactions between the turbine blades and the air. Low frequency sound is predominantly the result of the displacement of air by a blade and of turbulence at the blade surface.

"An important contribution to the low frequency part of the sound spectrum may be the result of the sudden variation in air flow the blade encounters when it passes the tower: the angle of attack of the incoming air suddenly deviates from the angle that is optimized for the mean flow.

"This effect probably has not been considered important as the blade-passing frequency is of the order of one hertz [one beat per second] where human hearing is very insensitive. This argument, however, obscures a very relevant effect: the low blade passing-frequency modulates well-audible [easily heard] higher frequency sounds and thus creates periodic sound. This effect is stronger at night because in a stable atmosphere there is a greater difference between rotor-averaged and near-tower wind speed. Measurements have shown that more turbines can interact to further amplify this effect.

"The effect is confirmed by residents near wind turbines who mention the same common observation: often late in the afternoon or in the evening the turbine sound changes to a more 'clapping' or 'beating' sound, the rhythm in agreement with the blade-passing frequency. It is clear from the observations that this is associated to [with] a change to a higher atmospheric stability. The increased annoyance has not been investigated as such, although there are indications from [the] literature [that] this effect is relevant. *It is of increasing relevance as the effect is stronger for modern (that is: tall) wind turbines.*"²

The university researcher, unlike Noble's paid consultant, states that the true noise issues are *not* being adequately addressed by wind farm developers or their consultants, and that wind turbines, contrary to

² GP van den Berg, "Do wind turbines produce significant low frequency sound levels?" *Eleventh International Meeting on Low Frequency Noise and Vibration and its Control*, Maastricht, The Netherlands, 30 August to 1 September 2004, p. 1.

what Noble is stating in its current public relations blitz, do produce low frequency sound. Van den Berg is investigating the complex way in which the low frequency vibrations of the blades passing the tower modify higher frequency sounds to produce the clapping or thumping noise that people even at some distance from wind turbines actually hear. In choosing what to investigate, he keeps his eye on what people are really experiencing.

What is significant about this research, too, is its discovery that taller turbines are louder than smaller ones, and its explanation of why wind turbines in general are so much noisier, at greater distances, than predicted by older sound propagation models. The answer is in the wind flow patterns higher above the ground, especially at night.³ Van den Berg studies turbines with 328 ft hub height. Even according to Noble's consultant, Leventhall, the older predictions for how sound will carry apply only up to about 180 ft hub height, while the turbines proposed for Malone will be 265 (and possibly 390) ft. Thus the constant refrain of the Noble salesmen, "The new technology won't have this problem...this study does not apply...that study does not apply..." is contradicted by research.

Given all this argument, and the slowness with which research catches up to people's experience, how do we keep neighbors' needs for peace and quiet from being swept under the carpet?

One way is *not* by trusting the pre-construction "study" of sound commissioned by Noble. This will not actually be a study (since the turbines will not be up). At worst it could be a generalized piece of writing with no mention of local conditions or terrain at all, like the report prepared by the same consultant for a wind power developer in New Zealand last year.⁴ At best it could be an exercise in *modeling* sound transmission over complex terrain in variable weather conditions, in a field of study in which the models themselves are in flux, changing as new information becomes available from existing wind farms. How will you and I, in Malone, be able to judge whether the models and variables are accurate and yield good results? We won't, of course, but we can be quite confident that a paid consultant will never reach the conclusion, for his client, that they can't go ahead with the project.

As an example of Noble's approach to the issue of pre-construction studies, let's turn to bird populations. This is my area of expertise, in which I have a PhD and scientific papers published in this country and

³ GP van den Berg, GP, 2004. Effects of the wind profile at night on wind turbine sound. *Journal of Sound and Vibration* 277:955-970.

⁴ Geoff Leventhall, "Notes on low frequency noise from wind turbines with special reference to the Genesis Power Ltd. proposal, near Waiuku, NZ," prepared for Genesis Power/Hegley Acoustic Consultants by Dr. Geoff Leventhall, June 4, 2004. Available from Dr. Leventhall at geoff@activenoise.co.uk.

abroad. The Noble representatives tell us that full and appropriate studies of bird and bat populations will be done before any turbines are erected. If this were truly Noble's intention, researchers would be in the field now, and Noble would not be talking about any turbine construction before 2007.⁵ Since there are no researchers in the field on the south end of Malone, and the main season for bird studies is well under way, we are really talking about 2008 at the earliest, because two years of study through the whole seasonal cycle—summer plus the spring and fall migrations (which extend from mid-March to December)—are a minimum requirement. Of course, the less you study something, the less chance you have of actually finding out something which might slow down the project.

Since this is the nature of Noble's approach to bird studies, I suspect their approach in other areas, such as noise, aesthetics, hydrology, soil, economic impact, etc. will be similar.

How can we prevent this, and have recourse if the turbines are actually built? Both problems require a tough, well-written town ordinance, specifying how studies are to be conducted and their results reviewed before permits are issued, and for later recourse, an escrow fund or cash bond to be put up by the developers, also before permits are issued. The escrow fund should be managed by a community committee, and set up to provide as many forms of economic safety for the community as are allowed by law. In it there needs to be a decommissioning fund for each turbine, to take it down, remove the concrete footer, and restore the land to its original state at the end of the turbine's useful life. There need to be funds to cover damages to the health, property values, and quality of life of nearby residents, should these occur. It would be good, too, if we could protect the town against future unfavorable changes in state tax law which might allow wind turbines to escape local taxation altogether, as they did in the State of Kansas.⁶ Wind energy companies have influence over tax law in both Washington and Albany, and there is already a New York State law on the books saying wind turbines are not subject to local taxes unless overridden by a specific local ordinance. Obviously, this override needs to be in our ordinance.

A powerful town ordinance has already been written for us by a group of lawyers. My husband circulated a preliminary version to the Planning Board and Town Board over a month ago, but it has now been

⁵ See Charles Hinckley, "Comments of Noble Environmental Power, LLC, in response to the initial facility certification and procurement notice (SAPA) No. 03-E-0188SA3, State Register, November 10, 2004," in which Noble Environmental informed the NY State Public Service Commission that "Noble is seeking to bring on line one or more wind generation facilities before the end of 2005." It appears from Noble's comments, in its petition to the PSC, that it is seeking an "expedited or fast-track" process, so as to "capture" the federal Production Tax Credit due to expire December 31, 2005.

⁶ Glenn R. Schleede, "Misplaced State Government Faith in 'Wind Energy'—This Time by the Kansas Energy Council." Round Hill, VA, 3/1/05.

refined and given a strong legal basis, anchored in the existing Malone Town Code. I urge townspeople to support a 6-month moratorium during which these issues are reviewed with the help of experienced outside counsel, followed by adoption of a strong regulatory ordinance that keeps our town and natural beauty from becoming another of civilization's waste heaps.