

Press release, 12/18/09

Wind industry study says no health effects near wind farms – but omits any mention of sleep disruption

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A [report issued by the American Wind Energy Association \(AWEA\) and the Canadian Wind Energy Association \(CanWEA\)](#) purports to assess all currently available research on the health effects associated with exposure to wind farm noise, and concludes that there are no such problems. The report, funded by North America's two key wind industry trade organizations, centers on the symptoms of the reported "[wind turbine syndrome](#)," and while it offers a robust critique of the idea that low frequency noise from wind farms can cause direct health impacts, it's hard to take its message of wind's "clean bill of health" at face value, thanks to many topics that are ignored or underplayed. The report minimizes the levels of annoyance and impacts on quality of life reported in other studies, and completely omits any assessment of the most widely reported health-related impact of living near wind farms, sleep disruption. *(For more complete assessments of health-related issues related to wind farms, see recent reports from the [Minnesota Department of Health](#) report and [World Health Organization](#).)*

The authors of the new AWEA/CanWEA report acknowledge that some people may be annoyed by the sounds of wind turbines, but stress that annoyance is not an "adverse health effect." They also seem intent on assuring that any mention of annoyance rates is kept to 10% or below, which necessitates some creative re-interpretation of one of their key sources, a recent paper by Eja Pederson that compiled results from three surveys near wind farms in Scandinavia, [summarized in October by AEI](#). In particular, they combine results from two studies in rural areas and one in a suburban area, which Pederson explicitly presented separately, because they illustrate that annoyance rates are far higher in rural areas (since the suburban study had more participants, the overall average is dominated by the suburban results). In AEI's view ([as regular readers will know](#)), the bottom line in all annoyance studies is that while many (or even most) people who are within earshot of wind turbines are not strongly affected by the noise, a substantial minority (ranging from 5-40% depending on how close they live) are negatively impacted, sometimes to the point of abandoning their homes; our challenge is to decide how many people we feel OK disrupting, and regulating wind farm siting to match that choice. The report also repeatedly states that "the sound emitted by wind turbines is not unique," while it elsewhere briefly acknowledges the often fluctuating nature of turbine noise (amplitude modulation) and its role in many reports of noise disturbance. (It is true, as the report stresses, that the sound levels and frequency range of wind turbines are similar to other noise sources humans live with; most notably, urban environments are filled with similar or higher levels of low frequency noise.) The authors do not assess studies that report that people seem to be far more easily and dramatically annoyed by turbine noise than by other typical noise sources (roads, airplanes, industrial facilities). This unusual sensitivity to wind turbine noise is presumably due to both its fluctuations at a pulse rate of once per second – within the range our auditory systems

are most attuned to, for perceiving speech – and the many variations widely noted in turbine noise (swishes, whistles, thumping, clanking).

Pederson and others have found that, as this report suggests, there is no clear correlation between annoyance levels and health effects or symptoms such as headaches, irritability, increased blood pressure, etc. It is likely true that the sounds of turbines do not themselves directly trigger health impacts, at least in any widespread way (though some individuals with pre-existing conditions may be more sensitive to noise effects). However, **the dominant direct effect of wind turbine noise that is most commonly experienced by neighbors is sleep disruption, which is well-known to cause or contribute to most of the health impacts reported. This study manages to sidestep this central issue almost completely** – the only mention of sleep disruption is a single paragraph that refers to a 1974 EPA document.

Meanwhile, the paper's concluding sections take a direct shot at the relevance of the World Health Organization's recommended noise exposure guidelines, quoting UK government documents that also downplay the recommendations as simply identifying the level below which particular effects (e.g., sleep disruption) are negligible, and suggesting that "significant impacts" may not occur until much higher noise levels are reached. This appears to be shifting the threshold of consideration from the WHO's attempt to largely avoid impacts (though even the WHO acknowledges that its limit is not designed to fully protect the most sensitive individuals), to a much more pliable target which would not consider limits unless a majority of the population is affected. See [this report for more on the WHO's recent update to its night noise guidelines](#), which notes that children, the elderly, and some with other infirmities are likely to be more sensitive to moderate night time noise levels.

This bias toward accepting negative impacts is reinforced as the report stresses that half of UK population lives in places where daytime levels exceed WHO standards, and two-thirds experience night noise higher than WHO recommends. To which I say: so what? Is there any real doubt that urban/suburban living and its attendant stresses are unhealthy to some degree? The AWEA and CanWEA seem to be saying that rural residents should buck up and take the noise they want to introduce into the rural countryside, because urban residents live with it already.

Here at AEI, I have so far largely avoided addressing the claims and counter-claims regarding the effects of low-frequency noise (both infrasound, which is below human hearing range, and barely audible low-frequencies at the bottom end of our hearing range), which are to a large degree central to this new AWEA/CanWEA report. My reticence is partly because it's apparent that both the audibility and possible physiological effects of low frequency noise exhibit even more individual variability than is present with audible noise, making its effects much harder to assess; but more fundamentally, my interest and expertise is focused on audible noise and its effects. It does not appear to me that we need to look or listen beyond clearly audible sound to address problems with current wind turbine siting practices. That said, other commenters, including ones with far more expertise in acoustics than I have, will doubtless be addressing the claims made in this paper regarding the relevance of low frequency sound around wind farms. As someone who has not read widely in the scientific literature on low-frequency sound and human physiology, this paper's critiques of the Wind Turbine Syndrome and Vibroacoustic Disease (VAD) triggered by wind farms were quite convincing, though I will hasten to add that the authors seemed rather too eager to lump ALL reports of any experience of uncomfortable or clearly perceptible low frequency noise near wind farms into a tidy bin that they effectively label "secondary effects of stress or annoyance." This over-simplified approach likely overlooks those individuals who do perceive low frequency sounds more readily than average, and may also miss possibly accentuated effects of low frequency noise on people with already-compromised vestibular systems. The report also focuses intently on the issue of WTS and VAD researchers' use of

studies that involved direct vibratory stimulation of bones to (perhaps erroneously) postulate similar effects from airborne sound waves, but ironically, the authors simultaneously fail to assess air- or ground-borne low frequency sound or vibration from active turbines that in some situations has led to resonance or vibrations in nearby houses. The focus on debunking the idea of direct physiological responses in humans has seemingly blinded these researchers to clearly troublesome landscape-scale issues occurring within a half mile or mile or so of wind turbines.

While challenging the scientific credibility of WTS and VAD hypotheses, and saying the next step would be case-control and cohort studies, they make no mention at least two ongoing research projects aimed at moving to the next level of clarity:

- In Maine, Dr. Michael Nissenbaum is conducting a cohort study to expand on his initial health-effects study at Mars Hill; the cohort study will assess the prevalence of similar health conditions in a local population that is out of earshot of the wind farm ([see this report for links](#)).
- In Ontario, Neal Michelutti of Queen's University is [conducting a health study](#) on Wolf Island that began before the wind farm there was commissioned and should be able to provide the first indication of any cause-effect in future symptoms, should they increase.

Finally, I note with some interest that the authors of this report refrain from one of the most widespread attacks on Nina Pierpont's wind turbine syndrome theory, which is to point out that her much-reviled book is self-published and has not gone through the traditional peer-review process that precedes publication of "real" science. This restraint is well-considered, as this report itself is also self-published, and has only been reviewed by its own authors, the "expert committee" picked by the trade organizations themselves.

[Download the full AWEA/CanWEA report here.](#)

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