

Wind Turbine Syndrome

Testimony before the New York State Legislature Energy Committee

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I am here to talk to you today as a physician-scientist about a clinical phenomenon called Wind Turbine Syndrome. This is relevant to today's hearing because it critically affects implementation of the RPS (Renewable Portfolio Standard) in terms of the siting of industrial wind turbines. Current siting practices (which are solely industry-driven) disregard public health. The supervision of the legislature—of this committee—is needed to create siting standards to protect the citizenry, all the citizenry, including citizens who are rural, old, ill, impaired, and very young.

Federal agencies are trying to put the brakes on willy-nilly wind turbine construction, citing, for instance, wildlife issues. The GAO (Government Accountability Office) last fall told US Fish and Wildlife to get involved. The National Academy of Sciences in April 2005 initiated a 20-month study on environmental impacts whose final report is due in December this year. There also needs to be a focus on human health, and the state needs to step up to the plate in terms of regulation.

I live in Franklin County, the poorest in NY State. Two years ago, after passage of the RPS, wind energy companies showed up there in force, as they have in all the poor, rural parts of the state. They showed up with no controls whatsoever, unregulated by either the legislature or NYSERDA (New York State Energy Research & Development Authority). Our town boards, made up of farmers, teachers, corrections officers, etc., were told, "You guys handle this," by our state representatives. I got involved as a responsible citizen and physician. Over the last 1½ years I have done a lot of reading, research, and interviews. I have spoken at town board meetings and before the St. Lawrence County Legislature, and published alone or with my husband (a retired university professor) numerous editorials and letters to the editor in local newspapers. My focus has been health issues and to some degree wildlife, in which I also have credentials in my PhD.

I get a lot of slander and abuse from the wind salesmen. Their favorites are saying that my abundantly referenced and footnoted articles, like the one before you (note: a separate handout), have "no evidence," or that I think wind turbines cause mad cow disease. The latter smear came from a town meeting in Ellenburg, NY, in October 2004, when I presented information culled from the medical literature on possible effects of low frequency noise. This included a paper out of the UK linking low frequency sound to prion diseases by a complex and highly speculative mechanism. I was very clear how speculative it was, but apparently the concept of something being speculative was over their heads, including over the heads of wind salesmen in the room.

I am not for or against the RPS. I'm an intelligent person and I support renewable energy. I am not here to shoot down wind energy, which probably has its place, though that place is not near people's homes or near schools, hospitals, or other locations where people have to sleep or learn.

I would like to stress that these are not "farms." One doesn't "farm" wind any more than one "farms" water in a hydroelectric dam or "farms" neutrons in an atomic plant. These are large, industrial installations. They make large-scale, industrial noise. "Jet engines" is the most common description I hear in surveying people—a jet engine that doesn't go away and which you can't get used to.

A syndrome in medicine is a constellation of symptoms and findings which is consistent from person to person. Defining a syndrome is the first step in investigating any new disease. The symptom cluster has to make sense in terms of pathophysiology—there has to be a plausible mechanism in terms of how the body and brain work. Defining a syndrome, and making that knowledge available to the medical community, lets other doctors go from scratching their heads over weird presentations of illness which are coming through their offices, to being able to validate and name what is going on and start to do something about it. It also opens the door to epidemiologic studies to define prevalence and risk factors, which will guide prevention and treatment.

Describing and documenting symptoms is the province of physicians. So is research on the causes of diseases. Deciding whether people have significant symptoms is not within the expertise of engineers or specialists in acoustics, even when the symptoms appear to be caused by noise. We physicians appreciate the noise data which engineers provide, but this data has nothing to do with whether people have symptoms or not. One British acoustics expert, Dr. Geoff Leventhall, is especially outrageous in this regard, insisting that people "can't" have symptoms because turbines "don't," he says, produce low frequency noise. His fallback, for which he is well paid by the industry, is that people make up their complaints. But he's not trained to distinguish whether people are making up their complaints, or to know about the range of physical, psychiatric, and neurological symptoms people might have. A related point: the hallmark of a good doctor is one who takes symptoms seriously and pursues them until they are understood (and ameliorated). This includes symptoms related to the brain, our most complex organ—symptoms which may be neurologic, psychiatric, or physical.

Three doctors that I know of are studying the Wind Turbine Syndrome: myself, one in England, and one in Australia. We note the same sets of symptoms. The symptoms start when local turbines go into operation and resolve when the turbines are off or when the person is out of the area. The symptoms include:

- 1) Sleep problems: noise or physical sensations of pulsation or pressure make it hard to go to sleep and cause frequent awakening.
- 2) Headaches which are increased in frequency or severity.
- 3) Dizziness, unsteadiness, and nausea.
- 4) Exhaustion, anxiety, anger, irritability, and depression.
- 5) Problems with concentration and learning.
- 6) Tinnitus (ringing in the ears).

Not everyone near turbines has these symptoms. This does not mean people are making them up; it means there are differences among people in susceptibility. These differences are known as risk factors. Defining risk factors and the proportion of people who get symptoms is the role of epidemiologic studies. These studies are under way.

Chronic sleep disturbance is the most common symptom. Exhaustion, mood problems, and problems with concentration and learning are natural outcomes of poor sleep.

Sensitivity to low frequency vibration is a risk factor. Contrary to assertions of the wind industry, some people feel disturbing amounts of vibration or pulsation from wind turbines, and can count in their bodies, especially their chests, the beats of the blades passing the towers, even when they can't hear or see them. Sensitivity to low frequency vibration in the body or ears is highly variable in people, and hence poorly understood and the subject of much debate.

Another risk factor is a preexisting migraine disorder. Migraine is not just a bad headache; it's a complex neurologic phenomenon which affects the visual, hearing, and balance systems, and can even affect motor control and consciousness itself. Many people with migraine disorder have increased sensitivity to noise and to motion—they get carsick as youngsters, and seasick, and very sick on carnival rides. Migraine-associated vertigo (which is the spinning type of dizziness, often with nausea) is a described medical entity. Migraine occurs in 12% of Americans. It is a common, familial, inherited condition.

To keep our balance and feel steady in space, we use three types of input: from our eyes (seeing where we are in space), from stretch receptors in joints and muscles, and from balance organs in the inner ear. At least two of these systems have to be working, and agreeing, to maintain balance. If the systems don't agree, as in seasickness or vertigo, one feels both ill and unsteady. Wind turbines impinge on this system in two ways: by the visual disturbance of the moving blades and shadows, and by noise or vibration impacting the inner ear.

Other candidate risk factors for susceptibility to Wind Turbine Syndrome are age-related changes in the inner ear. Five percent (5%) of otherwise healthy people from age 57 to 91 experience dizziness, and 24% experience tinnitus or ringing. Damage to the ears or hearing from other causes, such as noise exposure, is also a potential risk factor.

Inner ear organs are closely linked, by proven neurological connections, to the brain systems which control mood, anxiety, and one's sense of well-being. Disturbing the inner ear disturbs mood, not because a person is a whiner or doesn't like turbines, but because of neurology.

Data from a number of studies and individual cases document that in rolling terrain, disturbing symptoms of the Wind Turbine Syndrome occur up to 1.2 miles from the closest turbine. In long Appalachian valleys, with turbines on ridge-tops, disturbing symptoms occur up to 1.5 miles away. In New Zealand, which is more mountainous, disturbing symptoms occur up to 1.9 miles away.

In New York State, with its mixed terrain, I recommend a setback of 1.5 miles (8000 ft.) between all industrial wind turbines and people's homes or schools, hospitals, or similar institutions. This setback should be imposed immediately for turbines not yet built.

The legislature might want to set up a panel of clinicians to review the data and medical information I refer to here, but until this happens, and as research continues, a moratorium on all wind turbine construction within 1.5 miles of homes would be appropriate.

To recapitulate, there is in fact a consistent cluster of symptoms, the Wind Turbine Syndrome, which occurs in a significant number of people in the vicinity of industrial wind turbines. There are specific risks factors for this syndrome, and people with these risk factors include a substantial portion of the population. A setback of 1.5 miles from homes, schools, hospitals, and similar institutions will probably be adequate, in most NY State terrain, to protect people from the adverse health effects of industrial wind turbines.