Standing Senate Committee on Energy, the Environment and Natural Resources

Industrial Wind Turbines and Health

Wind Turbines Can Harm Humans

October 18, 2011

The Society for Wind Vigilance

www.windvigilance.com
20 Minutes

- Setting the stage
- Evidence
- Consequences
- Wrap-up

- Emphasis sometimes added to original quotes highlighting key points.
Introductions

- Ms Carmen Krogh
- Ms Beth Harrington
The Society for Wind Vigilance

- International federation of physicians, acousticians, psychoacousticians, engineers and other professionals

- Volunteers / self funded

- Goal - siting of wind turbines to protect health and safety
Setting the stage
“It is acknowledged that IWTs, if not sited properly, can adversely affect the health of exposed individuals.”

“This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree.”

Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment
Environmental Review Tribunal, Decision, p 207
What do we know?
Competing claims

ADDRESSING CONCERNS WITH WIND TURBINES AND HUMAN HEALTH

Revised: April 2009

These findings clearly show that there is no peer-reviewed scientific evidence indicating that wind turbines have an adverse impact on human health.

- Health Canada advises that this statement be revised to indicate that there are peer-reviewed scientific articles indicating that wind turbines may have an adverse impact on human health.
“It appears compliance with the minimum setbacks and the noise study approach currently being used to approve the siting of WTGs will result or likely result in adverse effects...”

MOE memorandum, Ontario Senior Environmental Officer, April 9, 2010
WHO 40 dBA guideline
- not for wind turbines

- WHO guidelines based on noise research related to
  - Road
  - Rail
  - Aircraft

- Not based on wind turbine noise


- Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment, Transcript of Dr. G. Rachamin, Mar, 4, 2011, p. 212, l. 2 to l. 16
An opinion on the likely health impacts of wind turbine noise in relation to the proposed Chatham-Kent wind farm installation. Author: Daniel Shepherd, PhD, 17 January 2011
32 dBA supported - peer reviewed 2011

In my opinion, based on my training, experience, measurements, and observations, serious harm to health occurs when a susceptible individual is so beset by the noise in question that he or she suffers recurring sleep disturbance, anxiety, and stress. The markers for this are (a) a sound level of LAeq (32dB) outside the residence and (b) above the individual’s threshold of hearing inside the home.

“... the setback distances should be calculated using a sound level limit of 30 to 32 dBA at the receptor, instead of the 40 dBA sound level limit.”

MOE memorandum, Ontario Senior Environmental Officer, April 9, 2010
Wind turbine sound/ noise may cause

- Annoyance [p. 5-3]
- Sleep disturbance [p. 4-3]
- Stress (sleep disturbance, headache, tinnitus, ear pressure, vertigo, nausea, visual blurring, tachycardia, irritability, concentration, memory, panic attacks, internal pulsation, and quivering = well-known stress effects of exposure to noise) [p. 4-3, 4-9, 4-10]

"The study does acknowledge that wind turbines can be annoying, the sound of wind turbines can be annoying for some individuals and that may cause them to feel some stress etcetera,…"

The main effect of daytime wind turbine noise is annoyance. The night time effect is sleep disturbance. These may lead to stress related illness in some people.
Noise Annoyance

1. Noise Annoyance

2. “... noise-induced annoyance is an adverse health effect.”

3. “... chronic severe annoyance induced by neighbour noise must be classified as a serious health risk for adults.”

4. “... annoyance can connote more than a slight irritation; it can mean a significant degradation in the quality of life. This represents a degradation of health in accordance with the WHO’s definition of health ...”

5. “... reputable research has shown that noise annoyance is an adverse health effect that can result from wind farms, as it can result in effects such as negative emotions and sleep disturbance.”
References for slide on annoyance


5. General Purpose Standing Committee No. 5 Rural wind farms Ordered to be printed 16 December 2009 according to Standing Order 231, Australia
Some people will be annoyed or highly annoyed at the presence of sound from wind turbines.

Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment - Transcript of Dr. G. Leventhall, Mar, 11, 2011, Witness for Suncor Energy
Final Draft MOE (Ontario) report - December 2010

LOW FREQUENCY NOISE AND INFRASOUND ASSOCIATED WITH WIND TURBINE GENERATOR SYSTEMS
A LITERATURE REVIEW

Ontario Ministry of the Environment RFF No. OSS-078696

FINAL DRAFT

Prepared for and submitted as evidence by Ministry of the Environment *

* MOE Disclosure Document # 34 - Erickson v. Director, Ministry of the Environment (10-121 and 10-122)
“The audible sound from wind turbines, at the levels experienced at typical receptor distances in Ontario, is nonetheless expected to result in a non-trivial percentage of persons being highly annoyed. As with sounds from many sources, research has shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related health impacts in some persons.”
What are the symptoms?
Stress – Ontario Environmental Review Tribunal witness *

Pierpont defined the symptoms of the Wind Turbine Syndrome as: “... sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory, and panic attack episodes associated with sensations of internal pulsation or quivering when awake or asleep.”

I am happy to accept these symptoms, as they have been known to me for many years as the symptoms of extreme psychological stress from environmental noise, particularly low frequency noise. **

Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Transcript of Dr. G. Leventhall, Mar, 11, 2011, *

WindVOiCe self reporting vigilance monitoring

* Follows principles Health Canada’s Canada Vigilance Programs *

* Consumers encouraged to self report adverse reactions (prescription / consumer products / vaccines / other)

* Continues for the life of the product


* Health Canada Canada Vigilance Programs www.healthcanada.ca *
Figure 7. Predicted probability of sleep disturbance by distance to industrial wind turbine (95% upper and lower confidence limits) 
Proc Genmod (logit link; binomial distribution). Sleep = ln(distance) + sex + intercept. p(distance) = .1015.
Peer Reviewed 2011
WindVOiCe headaches by distance

Figure 9. Predicted probability of headaches by distance to industrial wind turbine (95% upper and lower confidence limits)
Proc Genmod (logit link; binomial distribution). Headaches = ln(distance) + sex + intercept. p(ln distance) = .1837.
What are the plausible causes?
Plausible causes of health effects

- Amplitude modulation [1, 2, 3]
- Lack of night time abatement [1]
- Audible low frequency noise [4]
- Inaudible low frequency noise/infrasound [5, 6]
- Tonal noise [7]
- Stray voltage [8]
- Visual impacts [4, 9]
  - shadow flicker
  - flashing lights
References for plausible causes


What are authorities saying?
“We will see in the course of this hearing that lots of people are worried about windmills. They may not like the noise, they may think the noise makes them sick, but really what makes them sick is just the windmills being on the land because it does impact their property values. That’s what makes them sick is that, you know, they’ll get less money for their properties, and that’s what’s causing all this annoyance and frustration and all of that.”
Ontario Minister of Health Matthews
December 2010

“There is no evidence, whatsoever, that there is an issue related to turbines”

Heath, C. (2010, December), Health minister visits Clinton FHT. Clinton News Record
http://www.clintonnewsrecord.com/ArticleDisplay.aspx?e=2891265
While some people living near wind turbines report symptoms such as dizziness, headaches, and sleep disturbance, the scientific evidence available to date does not demonstrate a direct causal link between wind turbine noise and adverse health effects.”

WHO - peer reviewed 2009

World Health Organization, Night Noise Guidelines for Europe, 2009
http://www.euro.who.int/InformationSources/Publications/Catalogue/20090904_12
Ontario Chief Medical Officer Health

The Potential Health Impact of Wind Turbines

CMOH report only looked at direct links

CMOH author agrees with schema

Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Transcript of Dr. G. Rachamin, Mar, 4, 2011 p. 211, p 216
Tribunal expressed concerns:

“…about the Director’s apparent lack of consideration of indirect health effects and the need for further work on the MOE’s practice of precaution…”

Case Nos.: 10-121/ 10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision, p 206
Correspondence from Federal Officials 2009

‘... conclusively demonstrated from exposure to wind turbine noise is an increase in self-reported annoyance and complaints (i.e., headaches, nausea, tinnitus, vertigo).’ *

‘... the need for additional epidemiological investigations and evidence has been identified.’ **

July 30, 2009 Minister of Labour regarding Health Canada’s examination of scientific literature *

Aug 5, 2009 Letter David Butler-Jones, MD, MHSc, CCFP, FRCPC, FACPM Chief Public Health Officer, Public Health Agency of Canada **
“We certainly do not believe that this question has been settled. That is why we are keeping it under constant review. That is why we said in our review that we believe authorities must take a precautionary approach to this.”

“At this time there is insufficient scientific evidence demonstrating a link between exposure to wind turbine noise and harm to human health which would justify the Department invoking the precautionary principle.”

Correspondence Sept 27, 2011 Minister of Health, Leona Aglukkaq
WHO on precaution

“In all cases, noise should be reduced to the lowest level achievable in a particular situation. Where there is a reasonable possibility that public health will be damaged, action should be taken to protect public health without awaiting full scientific proof.”

Developments down under

Peer reviewed articles recommend 2 km minimum setback (without consent) [1, 2]

Proposed 2 km minimum setbacks (without consent) [3, 4]


3. Advisory Note 36, August 2011-10-04Amendment VC82 Changes to wind energy facility provisions State Government Victoria Planning Provisions, Australia

4. General Purpose Standing Committee No. 5 INQUIRY INTO RURAL WIND FARMS Media release Wednesday 16 December 2009, Australia
“The Committee recommends that the Commonwealth Government initiate as a matter of priority thorough, adequately resourced epidemiological and laboratory studies of the possible effects of wind farms on human health.”

The Social and Economic Impact of Rural Wind Farms, June 23 2011
What are the consequences?
Health impacts Ontario
peer reviewed 2011

“...My research demonstrates that IWTs were initially welcomed into communities. The reported adverse impacts were unexpected...”

“In addition to physiological and psychological symptoms there are individuals reporting adverse impacts, including reduced well-being, degraded living conditions, and adverse societal and economic impacts. These adverse impacts culminate in expressions of a loss of fairness and social justice.”

... wind turbines were initially welcomed by many communities due to their environmental credentials...

... residents living within 2 km of a turbine installation reporting lower overall quality of life, physical quality of life, and environmental quality of life. Those exposed to turbine noise also reported significantly lower sleep quality ...

La Gaspésie, Quebec

Courtesy of Eco Awareness Society, Nova Scotia
We, the undersigned, Dr. Linda Bernier, Dr. Céline Coté, Dr. Louis Auger, hereby certify that a petition was signed by 52 physicians in Québec, entitled:

*Petition for health: Industrial wind turbines in inhabited areas.*

Given the risks and potential negative effects of industrial wind turbines on the health of human beings living near these installations, we the undersigned have signed the above petition in order to request that the Government of Québec put a halt to any and all projects being planned or under way, in inhabited areas, until such time as the research is sufficiently advanced to enable our health authorities to determine beyond doubt what is the safe offset distance that must separate such a wind turbine from a residence.
Wolf Island, Ontario

Courtesy of L. Gillis, Ontario
Low frequency noise induced annoyance

“Those exposed may adopt protective strategies, such as sleeping in their garage if the noise is less disturbing there. Or they may sleep elsewhere, returning to their own homes only during the day.”

Escaping wind turbine LFN * – 5 shut down at night

Family eventually bought out by wind energy developer - non disclosure

* Confirmed in: Community funded noise study, Developer noise study, Freedom of Information

Courtesy of B. Ashbee, Ontario
Impact statement – now bought out

“I am a teacher, we are driven from our home of 31 years and I have to teach the social marketing about wind turbines to our youth”

Personal interview September / October 2010
Impact statement - abandoned home

“I am forced to sit back and say nothing as my own teachers teaches my classmates and peers that wind energy is flawless... I am forced to live away from home with my grandmother.

... I can never go home.”

Personal communication September / October 2010
Ripley delegation part 1

“Sleep deprivation; sleep disturbances; poor-quality sleep; humming in the head by the ears; edginess; a feeling as if you’ve had five cups of coffee; bad temper; heart palpitations; heaviness in the chest; pains in the chest like needles; increased blood pressure, 217 over 124; uncontrollable ringing in the ears; earaches; sore eyes, like you have sand in them; digestive problems which continued for months; headaches which caused you to be bedridden; the sensation of your skin crawling or being bitten by bugs; sore joints; nosebleeds; sores on feet that would not heal until you moved out of your home”

Ripley delegation part 2

“We begged for sleep, and four families were billeted by the wind company from their homes for 90 to 180 days in motels, hotels and a rooming house.”

Note: Five families were eventually bought out by the developer 2011

Wrap up
WHO - definition of health

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” *

Canadian federal, provincial, and territorial governments and health officials have accepted WHO’s definition of health **


Conclusion

Before proceeding further:

- Conduct clinical / laboratory studies for siting
- Conduct research on environment / endangered species
- Establish vigilance monitoring and long term surveillance
- Provide resolution / restitution for existing sites
For more information
www.windvigilance.com

Peer reviewed references:
Overview of abstracts and citations provided in an attachment