

Facts informing the APAI decision making process – Health

Peer-reviewed Scientific Publications

- In 2010, 2011 and 2012 there have been numerous peer-reviewed scientific publications that clearly demonstrate a link between exposure to industrial wind turbine noise and harm to human health. A summary of the most recent research is available at the following link: <http://www.windvgilance.com/about-adverse-healthc-effects>.
- Environmental noise, low frequency sound and shadow strobing from wind turbines have been shown to exert indirect effects on several human health parameters. These include, but are not limited to, sleep disturbance, headache, stress, vertigo, tinnitus, irritability, fatigue, nausea and “annoyance”.

Ontario Environmental Review Tribunal (ERT) - 2011

- A 2011 Ontario Environmental Review Tribunal (ERT) decision found that “The 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.”[1]
- The ERT decision mentioned above also found that “serious harm to human health” includes “indirect impacts (e.g., a person being exposed to noise and then exhibiting stress and developing other related symptoms).”

Setbacks

- The Ontario Government insists the setbacks between industrial wind turbines and “noise receptors” (i.e., homes and people) are safe and among the most stringent in North America. The Ontario setbacks are based on computer modeling, not real world clinical experience. These “safe” setbacks have resulted Ontario residents being forced from their homes, frequently without compensation. Furthermore, several dozen jurisdictions in North America have much farther setbacks. A table providing detailed, referenced setback data is available at www.ProtectAmherst@Yola.com.

Chief Medical Officer of Health (CMOH) May 2010 Report: The Potential Health Impacts of Wind Turbines.

This report is a very dated, 14 page literature review with no original research. The report examines the direct health of effects of IWT on health and concludes; “The sound level from wind turbines at common residential setbacks is not sufficient to cause hearing impairment or other direct health effects, although some people may find it annoying.”

1. Environmental Review Tribunal (2011, Case No's 10-121,10-122, Erickson v. Director, Ministry of the Environment, p. 207)

- **Direct Health Effect:** As stated in the CMOH report, a direct health effect from an IWT would be an effect along the lines of hearing impairment, or an injury resulting from a blade throw. Clearly, direct health effects are not the main issue.
- **Indirect Health Effect:** The Merriam Webster Medical Dictionary defines an indirect health effect as: “involving intermediate or intervening parts or pathways, (example: stimulation of one eye elicits narrowing of the pupil of the other eye by an *indirect* reaction). The CMOH report does not state that IWT do not cause indirect health effects. In an interesting turn of phrase the report states; “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.” In fact, the report reiterates a lack of direct health effect while acknowledging that indirect health effects are being documented. However, the report never addresses the large body of evidence that details the plethora of indirect health effects that can result from exposure to the noise generated by IWT.
- **Annoyance:** Annoyance is a term defined by the World Health Organization (WHO) that dates back to issues around airport flyways and highway noise factors. Clinically speaking, “Annoyance” is defined as a feeling of discomfort that is related to adverse influencing of an individual or a group by any substances or circumstances. Annoyance expresses itself through malaise, fear, threat, trouble, uncertainty, restricted liberty experience, excitability or defenselessness.
- With chronically strong annoyance a causal chain may exist between three following steps; good health > annoyance > disease. Annoyance is important.

World Health Organization (WHO)

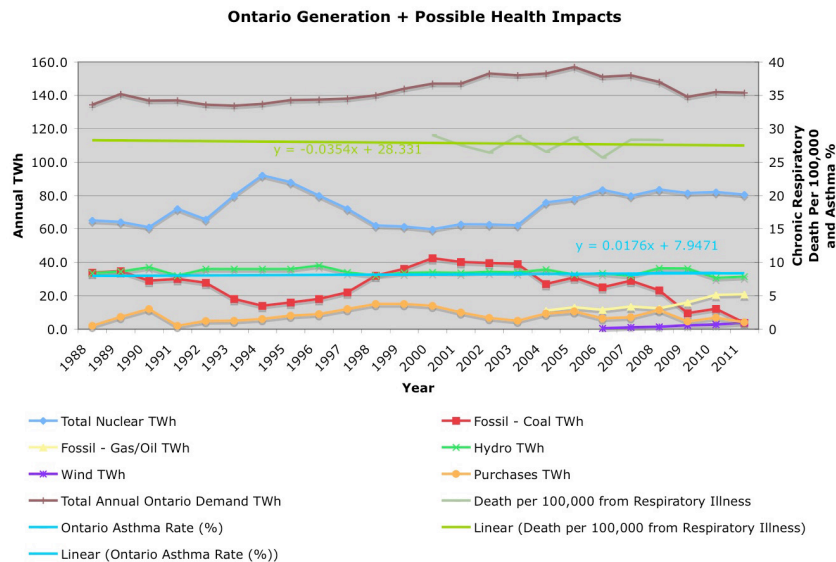
The WHO was established in 1948 as the specialized agency of the United Nations responsible for directing and coordinating authority for international health matters. One of WHO’s functions is to provide objective and reliable information and advice in the field of human health. At this point in time, **the WHO has not made any recommendations with regards to what constitutes acceptable IWT generated noise levels.** However, it is a well-documented fact that IWT produce low frequency noise. Following is the WHO position on low frequency noise. The Ontario Government bases IWT noise measurement on A-weighting.

“If the noise includes a large proportion of low-frequency components, values even lower than the guideline values will be needed, because low-frequency components in noise may increase the adverse effects considerably. When prominent low-frequency components are present, measures based on A-weighting are inappropriate.” [1]

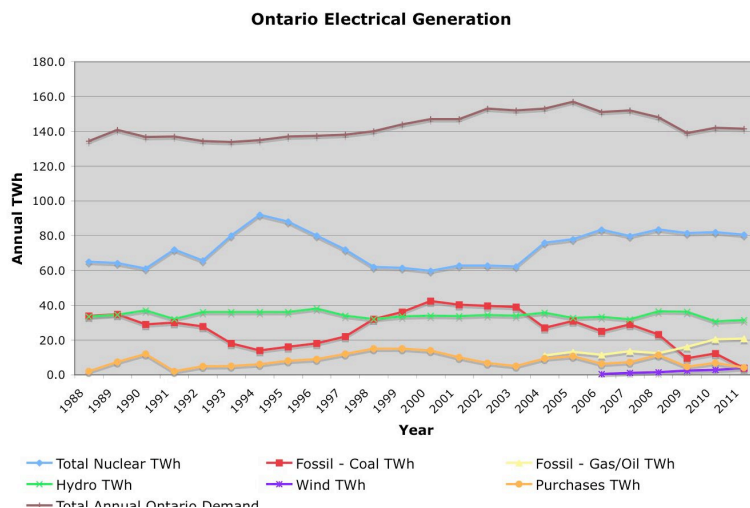
1. World Health Organization. (1999). Guidelines for community noise. Geneva; OMS, 1999, 94 p. Illus, Authors: Berglund, B., Lindvall, T., Schwela, D. H.

Facts informing the APAI decision making process - Coal

- The Ontario government insists that the development of renewable energy is necessary to rid Ontario of air pollution caused by “dirty coal.”
- The Chart below clearly indicates that the reduction in the use of coal has had a negligible impact on the health of the Ontario populace. On this chart, the data from Statistics Canada (available from about 2001 to 2011) for the deaths from respiratory illness in Ontario and the asthma rate in Ontario have been plotted along with the generation data. Plotting the linear regression lines for each, there is no clear impact of the reduction in coal generation from 40 TWh to 4 TWh. It hardly presents a clear linkage between coal usage and adverse health effects.



- Despite Liberal claims, coal use had not been shut down by renewables (wind and solar). The chart below shows the contribution various energy sources have made to the annual Ontario consumption in TWh from 1988 to 2011. It can be seen that from the year 2003 to 2011, coal usage did drop from 40 TWh to 4 TWh. This decrease was due to the following: the increase in nuclear output of over 20 TWh; the increase in natural gas output to about 20 TWh, and the decrease in the system load by about 18 TWh due to the recession [14]



Facts informing the APAI decision making process- Economic

Expanding Ontario's renewables portfolio is redundant. According to the IESO, in 2011, 79.1% of Ontario's electricity came from nuclear and hydropower, which do not generate emissions. Wind power simply displaces lower cost hydro and nuclear power with no effects on CO2 emissions.

Most wind turbines run at 25 to 28 percent of name-plate capacity. This means that generating any substantial amount of electricity from wind power requires massive numbers of wind turbines spread over large tracts of land. Additionally, because of their intermittency and unpredictability IWT require the availability of back-up generation, especially peak-load capacity. The need for back-up dramatically reduces the net contributions of wind power to CO2 abatement.

Highlights from the Ontario Auditor General Report of 2011

- In April 2010, the Ontario Energy Board completed an analysis predicting that a typical household's annual electricity bill will increase by about \$570, or 47% by 2014. More than half of this increase is due to renewable energy contracts.
- The Liberal estimate of the creation of 50,000 jobs in the "green energy" sector is fiction. The report further noted that even if 50,000 new jobs were created, the higher energy costs will result in job losses elsewhere in the economy. Another recent study in Canada estimated that each new job to be created as a result of renewable energy programs would cost \$179,000 each year."
- Studies have shown that for each job created through renewable energy programs, about two to four jobs are often lost in other sectors of the economy because of higher electricity prices.
- Ontario is presently experiencing an oversupply of electricity. An analysis of net exports from 2005 to the end of 2011 indicates that in that time Ontario lost \$1.8 billion through electricity exports. It is interesting to note that the first industrial wind turbines came on line in 2006, introducing a new level of volatility to the grid.
- Despite anticipated surpluses, renewable energy generators who have contracts with the OPA will get paid even though Ontario does not need their electricity. These payments could range from \$150 million to \$225 million a year.
- In 2010, 86% of wind power was produced on days when Ontario was already in a net export position.
- The IESO confirmed that consumers have to pay twice for intermittent renewable energy—once for the cost of constructing renewable energy generators and again for the cost of constructing backup generation facilities, which usually have to keep running at all times to be able to quickly ramp up in cases of sudden declines in wind energy production during times of surplus. The cost will be well over \$225 million per year, and will be more likely 10 times higher each year.