Revisiting the Association between Wind Turbines and Public Health

Deputation to Grey Bruce Board of Health

Multi Municipal Energy Working Group (MMEWG)
Presenters
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Why we are here:

- The MMEWG is comprised of elected members of municipal councils and council appointed citizens whose “Terms of Reference” note:
  - The purpose of the Committee is to draw together representatives from municipalities to share, discuss and advocate “best practices” and other means to address mutual concerns regarding energy generation facilities and storage infrastructure to all the relevant Government Ministries and Agencies.
- A citizen’s delegation to the MMEWG requested clarification for the association between wind turbines and public health.
  - Correspondence received from the A/Director, Health Protection, Policy and Partnerships Branch, Office of the Chief Medical Offer of Health in response to a request from the MMEWG for this clarification stated (in part):
    - *Pursuant to s. 13 of the Health Protection and Promotion Act (HPPA), a medical officer of health (MOH) or a public health inspector may make a health hazard order where he or she is of the opinion, upon reasonable and probable grounds that a health hazard exists in the health unit served by him or her, and that the requirements specified in the order are necessary in order to decrease the effect of or to eliminate the health hazard.*
- We note that in Feb. 2013, the Grey Bruce Medical Officer of Health, Dr. Hazel Lynn, accompanied by Dr. Ian Arra reported an association between wind turbines and health, and as described by CTV News, Dr. Lynn stated, *“more public health research is needed on the turbine issue.”*
- This delegation from the MMEWG is to request that subject should be revisited now.

Why it matters to act now:

- The IESO (Independent Electricity System Operator) issued two documents in Dec. 2023, one for public comment, and one as an update to the Minster of Energy that propose:
  - The need to develop 5 TWh of new energy supply by 2030 due to growing demands on the electrical system (mostly to supply decarbonization initiatives such as electric cars and electric heat pumps)
  - This is to be supplied by 2000 MW of new generation, mostly from repowering 2940 MW of existing wind turbines whose contract ends between 2026 and 2034, and a smaller part from new solar arrays.
  - They suggest repowering wind turbines can be done on their existing footprint. Existing turbines would need to increase in output by 168% to 4940 MW, requiring taller towers and larger turbine rotors.
  - Most of the turbines to be repowered were installed before current setbacks of 550 metres were in effect, or the current method of assessing noise was established.

What this will mean to citizens:

- Using the example of the Enbridge Underwood array in Bruce County, 41 of the 110 turbines in the array are located at distances under the regulated limit of 550 metres. These would all be increased in size and output under repowering.
- 52 of the homes assessed in the “final” environmental noise assessment used to approve the array have setbacks to the nearest turbine less than 550 metres, some as close as 444 metres. Some homes 2 turbines closer than 550 metres and up to 37 turbines within 3000 metres.
- Many of the homes already have noise exposures greater than allowed by current regulations when the assessment is done using rules established after the original approval.
- An already bad situation will become worse as turbines are replaced with larger rotors and taller towers.

The so what? Consequences noted already.

- A few examples, using the example of the Enbridge Underwood array.
  - A male, in his 50's, with no previous known heart conditions, living within 485m of the nearest turbine, with 4 within 1000m, 11 within 2000m and 13 within 3000 m died suddenly of a cardiac arrest.
  - A female, in her 30's, with no previous known conditions, living within 530m of the nearest turbine, with 3 within 1000m, 13 within 2000m, and 35 within 3000m died suddenly. ERT were unable to restart her heart.
  - A male, in his early 60's with no known previous conditions, living within 518m of the nearest turbine, with 2 within 1000m, 10 within 2000m, 18 within 3000m died suddenly.
  - A female in her 50's, with no known previous conditions, living within 453 m of the nearest turbine, with 6 within 1000, 14 within 2000m, 26 within 3000m had to leave her employment and home after making critical mistakes that could impact the health of others. OK when away from home, symptoms of sleep deprivation, and nausea returned when back at home.
  - A male in his teens, who was an infant when turbines installed, living within 500m of the nearest wind turbine, with 5 within 1000m, 10 within 2000m, and 12 within 3000m suffers chronic headaches, medical staff unable to determine a cause
  - There are many more …

What current research shows:

- Research conducted in Ontario, partly within Grey-Bruce presented to International Wind Turbine Noise Conference, to Canadian Acoustic Association Convention, and documented in industry journal WindTech International concluded:
  - *annoyance can be reliably predicted by an objective measure based on simple-to determine acoustic parameters. The objectively predicted annoyance correlates closely with times when impacted residents subjectively identify annoyance. This criterion can be used to assess when annoyance is predicted to occur and thus when mitigatory action should be taken. The important finding shows that annoyance is linked to an acoustic condition present when wind turbines operate and is not only a product of visual triggers or attitude.*

Briefly, how research conducted:

- Collected continuous 10 minute samples of sound recordings using MOE compliant methods over 8 months, at a home 537 metres from nearest wind turbine, with 19 turbines within 3000 metres.
- Residents logged conditions identified as annoying.
- Sound sample later analyzed for times annoyance logged (residents did not know the sound conditions when logging conditions identified as annoying)
- Identified hypothesis from analysis of acoustic condition existing when annoying conditions logged.
- Tested hypothesis by analysing conditions at other sites, and when turbines started up or shut down. Confirmed hypothesis criterion was met when turbines on, not when they were shut down.
- Collected second set of data, with simultaneous recordings at location near wind turbines, and at second location more than 6 km from wind turbines, but same environmental conditions. Confirmed hypothesis met near turbines but not present at location distant from wind turbines.

Impact on conclusion if turbines repowered.

- Research hypothesis shows annoyance criterion met when variation of low frequency component of sound sensed by full spectrum analysis (Z weighting) is greater than variation of normal audible (A-weighted, used for regulatory limits) sound.
  - Annoyance criterion ***LA10-LA90 ≤ 3 dB while LZ10-LZ90 ≥ 6 dB*** tends to match actual annoyance reports.
- Turbines with larger rotor diameter have a greater fraction of noise in the low frequency spectrum sensed by Z weighting.
- Repowering turbines will increase objective measure of annoyance.
- The bottom line … things that are bad now, will get worse.

What can Board of Health do?

- Institute rigorous review of reports of annoyance, adverse health consequences, or deaths, correlated to residence proximity to nearest wind turbine, and the number of turbines within 1000, 2000, and 3000 metres. (We can share data we have from citizen deputations)
- Review the current research into an objective measure of annoyance from analysis of sound from wind turbines, and share review findings with Chief Medical Officer of Health. Research shows need to change current method of calculating limits based only on A-weighted sound.
- As necessary, issue a heath hazard order before IESO issues licences to repower current wind turbines – many not even meeting current standards, as repowering would worsen an already bad situation.

How does this fit Board of Health priorities?

- Many current issues facing Grey Bruce Public Health arise from a public feeling of despair, and loss of hope:
  - Growing opioid addiction, overdoses, and deaths.
  - Citizens identify concerns with rising housing costs, inflation arising from increasing money supply, and more and more are living “on the streets” with little hope of ever returning to a normal life.
  - Health care professional burn out, and citizen difficulty receiving medical care.
- Many of these issues are dominated by the too common impression that those in authority do not care.
- The actions suggested are ones that can be accomplished with relatively small expenditure, and will demonstrate that the Board of Health does care, and want to prevent a bad situation from becoming worse.
- Any action that generates hope can have benefits to reduce overall despair, and impact even seemingly unrelated issues.

Thanks for your attention.

Questions, or comments?

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