

Response to Wind Energy Propaganda Presented to the Senate
Committee on Energy, the Environment and Natural Resources,
Nov. 23rd, 2010

Summary

This report addresses misinformation presented by Mr. Sean Whittaker, VP Policy of the Canadian Wind Energy Authority (CanWEA), to the Senate Committee on Energy, the Environment and Natural Resources. In talking about controversy, Mr. Whittaker ignores adverse health effects. These are real. The CanWEA-sponsored and the Ontario-sponsored literature surveys that concluded that there are no direct adverse health effects are both flawed. Turbine noise is a world-wide problem causing annoyance and sleep deprivation to those living in proximity to the turbines. Intense lobbying by the wind industry has resulted in setbacks from homes of less than 500 metres; this compares with setbacks of 1.5 to 2 km recommended by various health authorities.

Wind energy is intermittent and therefore unreliable. It can only ever contribute in a minor way to Canada's electrical energy supply. CanWEA's argument that the wind is always blowing somewhere is not borne out in practice. Wind energy is expensive. Converting to a carbon cost for fossil fuel (coal) replaced, the result is \$80 and \$120/tonne of CO₂ for on-shore and off-shore wind energy respectively. This will be higher when the federal subsidy, various tax breaks and the carbon cost of running back-up natural gas generating plants is factored in. The CanWEA estimate of the number of homes served, on average, by wind energy is overstated by up to a factor 2.

Mr. Whittaker is wrong in stating that if anything the value of property is increased by nearby turbines. He shrugs off the adverse effects on birds, bats and migratory pathways with the statements that the Audubon Society is among the strongest supporters of wind energy and that the wind industry no longer builds on migratory pathways. The truth is otherwise.

Introduction

I would like to respond to the propaganda concerning wind energy presented by Mr. Sean Whittaker to the Senate Committee on November 23rd. First, I should like to congratulate the Senate Committee on the quality of some of the questions asked.

My credentials for responding are as a professor emeritus of physics with a background in acoustics, a career involving research, and expertise in numeracy. I have also presented to the World Wind Energy Conference in 2008, the annual conference of the Canadian Acoustics Association in 2009 and the recent International Symposium on the Adverse Health Effects of Wind Turbines (Oct. 2010). Furthermore I am a member of the Ontario Ministry of the Environment

Focus Group on Wind Turbine Noise Regulation. My response will be separated into sub-headings:

Adverse Health Effects

There are adverse health impacts on those living in close proximity to wind turbines. This issue was not raised by Mr. Whittaker although he is well aware of it; it is a world-wide phenomenon. In Ontario alone there are over 100 people self-reporting adverse health effects; for these people the average setback of the nearest turbine is about 800 metres.

http://www.windvigilance.com/windvoice_overview.aspx

Provincial noise regulations have allowed turbines as close as 350 metres from homes. The new Ontario regulations have imposed an insufficient limit of 550 metres but there are wind farms already in place with far smaller setbacks. By contrast various health authorities advocate setbacks of 1.5 to 2 km from homes. The reason for the larger setbacks is that turbines generate audible and inaudible (infra-) sound which can cause annoyance and sleeplessness. In turn, these lead to a range of health problems that fall under the general term wind turbine syndrome. Mr. Rick James, an acoustics engineer, has drawn the parallel to the sick building syndrome, one of whose causes has been attributed to audible and inaudible (infra-) sound from building ventilation systems. The health problems associated with turbine noise has driven more than a dozen families in Ontario to abandon their homes and others to seek safe houses or accommodation with family and friends. This is a very, very real problem.

In October, 2010, the Society for Wind Vigilance, an international group of scientists, engineers and medical professionals, held the first Symposium on Adverse Health Effects from Wind Turbines with speakers from Canada, the USA and England.

Dr. Nina Pierpont MD, PhD was the keynote speaker. She described her work interviewing and diagnosing a number of turbine noise sufferers and her work on the impact of turbine noise on the learning ability of children. Some of the common problems were chest sensations, panic attacks, breathing problems and waking in a state of alarm. There was a correlation with motion sensitivity and motion sickness. Carmen Krogh BSc addressed the issue of social justice. She knows and has interviewed many of those in Ontario suffering health effects and brought forward some of their stories.

Dr. Michael Nissenbaum MD described his extensive clinical study of adverse health effects caused by the Mars Hill wind farm in Maine. This study used internationally accepted methodology for interviewing the study subjects and analysing the results. The results, presently being prepared for submission for peer review and publication, showed a clear dependence of sleep quality and mental health on proximity to the turbines.

Dr. Alec Salt PhD, a specialist in cochlear physiology, explained how the ear does in fact react to inaudible infrasound. There are outer hairs cells within the ear which respond to low frequencies and have their own pathway into the brain. These outer hair cells respond to infrasound at levels 40 dBA below the levels detected by the better known inner hair cells that respond to audible sound. This is important corroboration of the common complaints from those suffering from turbine noise that they are subject to a sensation that drives them to distraction.

Dr. Hanning MB, BS, MRCS, LRCP, FRCA, MD, a sleep specialist, described the nature of sleep and how it is disturbed by low levels of noise. He also described the different reactions to noise at night in terms of the spindle rate, the rate of bursts of high frequency brain waves. Even so, for all spindle rates, the sleep disturbance increases with the noise.

A noted epidemiologist, Carl Phillips PhD, emphasized that there is ample evidence that wind turbine noise is causing health problems. He decried the attempts by the wind industry consultants, mostly without credentials in epidemiology, to dismiss this evidence as anecdotal. He pointed to the significance of case-cross-over evidence, the onset and then absence of the adverse health effects on living in proximity to turbines and then moving away.

There have been two health studies in North America. The first was commissioned jointly by the American and Canadian Wind Energy Authorities; the second was performed by the Chief Medical Officer of Health on behalf of the Ontario government. Both were literature surveys; neither took the trouble to talk with the many sufferers of adverse health effect. This is a particularly serious concern with the CMOH report because Dr. King had access to all of the Medical Officers of Health in communities across the province.

Grey-Bruce Medical Officer of Health Hazel Lynn was probably the only person on the panel who had actual first hand medical knowledge of the adverse health effects on those suffering from the wind turbines since she has come into contact with dozens of people in Grey and Bruce County who are currently suffering. Dr. Lynn and one other (Dr. Ray Copes, Director, Environmental and Occupational Health, Ontario Agency for Health Protection and Promotion) requested that their minority opinion be included in the report. Why were these dissenting voices ignored? Dr. King's office claimed that the report's conclusions were based on the majority opinion of the panel. But surely there is a breakdown in acceptable process to exclude the views of the one expert who had the greatest field experience with health complaints from wind turbines? Or was it a government requirement that the report should be free from dissenting opinion in the hope that it would reassure the public that no problems existed?

Both reports concluded that there is no direct health impact on health. However, both reports acknowledge annoyance and sleep disturbance. Seemingly they ignore the protocol of the World Health Authority which recognizes annoyance

and sleep disturbance as adverse effects. In addition it is the annoyance and sleep disturbance that leads on to the other adverse health effects. That is, many of the adverse health effects are indirect in nature.

Turbine Noise

The noise of wind turbines is the dominant environmental impact on rural residents. Noise is dismissed by Mr. Whittaker. “No louder than a library; the sound of leaves masks the noise; ...”. Unfortunately, the reality is otherwise. In the words of Dr. Hanning, turbine noise is in-your-face noise. It is predominantly low frequency noise, it is amplitude modulated (the swoosh-swoosh-swoosh), it can be detected even when 10 to 15 dBA below the background noise (Dr. Hanning again). The masking by the wind rustling leaves is a myth that Mr. Whittaker and CanWEA know full well has been put to rest.

Ontario is the last jurisdiction in the world to allow turbine noise to increase with the wind speed because of the claim that masking noise also increases with the wind speed. The basis for the myth was that as the wind speed increases so do both the turbine noise and the masking noise from the wind blowing through vegetation and over and around buildings. However the fact is that, particularly at night-time, the atmosphere can be stable with significantly higher wind speeds at turbine hub height than at ground level. This means that the turbines are generating power and noise but there is no masking noise. Ontario eventually accepted the argument, not by removing the allowance from the regulations but by requiring the companies to justify the allowance by measuring the wind speed gradient as part of the environmental approval process. Needless to say, the companies have not been able to justify the allowance and are not able to use it. Nevertheless, most of the present wind farms in Ontario were developed with the allowance; this is one of the many contributors responsible for the large number of complaints about turbine noise. The science of wind speed gradients in the atmosphere has been known for years. The particular problem of the missing masking noise has been in the scientific literature for at least 5 years. If CanWEA, the companies and the Ontario Ministry of the Environment had been honest none of those wind farms would have had the small setbacks that they are stuck with.

As noted above, the periodic character of turbine noise makes it especially both detectable and annoying (think of a dripping tap!). Ontario actually has a noise regulation that adds a penalty of 5 dBA for noise sources of a periodic character. However, the turbine noise regulations have a paragraph excluding wind turbines from the general regulation. This is quite dishonest and one can only imagine where the pressure for the exclusion came from.

With its long experience with wind energy, Germany has a night-time noise limit of 35 dBA. The German population density is 20 times that of Ontario and even larger for Canada as a whole. There is no reason that anywhere in Canada should have a higher noise limit than Germany.

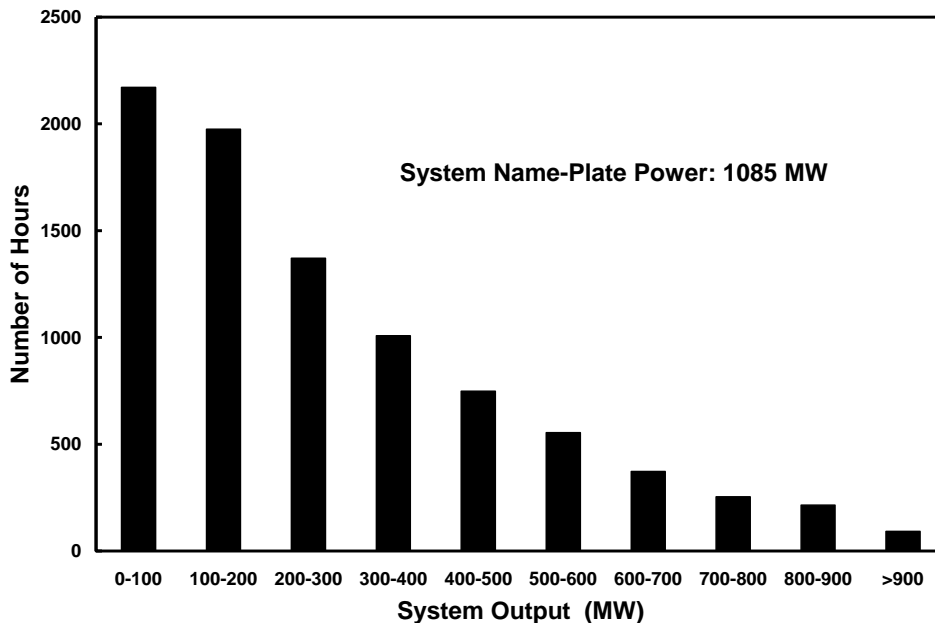
A new problem coming up is that Canada is heading for off-shore turbines. There is enough European research to show that turbine noise propagates readily over water. I have recently written a report based upon that research; it demonstrates that for a likely 100 turbine project, the turbines should be 20 km from shore. This is far larger than the draft proposal from the Ontario government for a 5 km exclusion zone. Copies of the report were sent to the Deputy Director at NRCan and to the Ontario Ministry of the Environment. Interestingly, as Europe builds more off-shore wind farms the setback from shore has been growing and is far beyond the 5 km exclusion zone proposed here. This is definitely an area that the Federal government should be controlling.

In conference papers and in reports to the Ontario Ministry of the Environment I have shown that, with a lower noise intrusion (35 dBA), a penalty for the periodic character of the turbine noise, and use of the uncertainty inherent in the variation of the turbines and of the noise prediction methodology, setbacks from homes would be 1.5 to 2 km from on-shore turbines. This is in line with setbacks recommended by health authorities.

Viability of Wind Energy

Mr. Whittaker talked of a capacity factor (actual power generated divided by the nameplate power) of 35%. This is typical of wind energy proponent's claims. I know only of the Ontario system. During the full year July 2009 to June 2010, the capacity factor of the Ontario system of 1085 MW was 26%. The range was from a low of 24% for Amaranth near Shelburne, Prince near Sault Ste. Marie and Wolfe Island near Kingston to a high of 34% for Port Alma on the shore of Lake Erie.

Wind Power Output Distribution: Ontario, July 2009 to June 2010

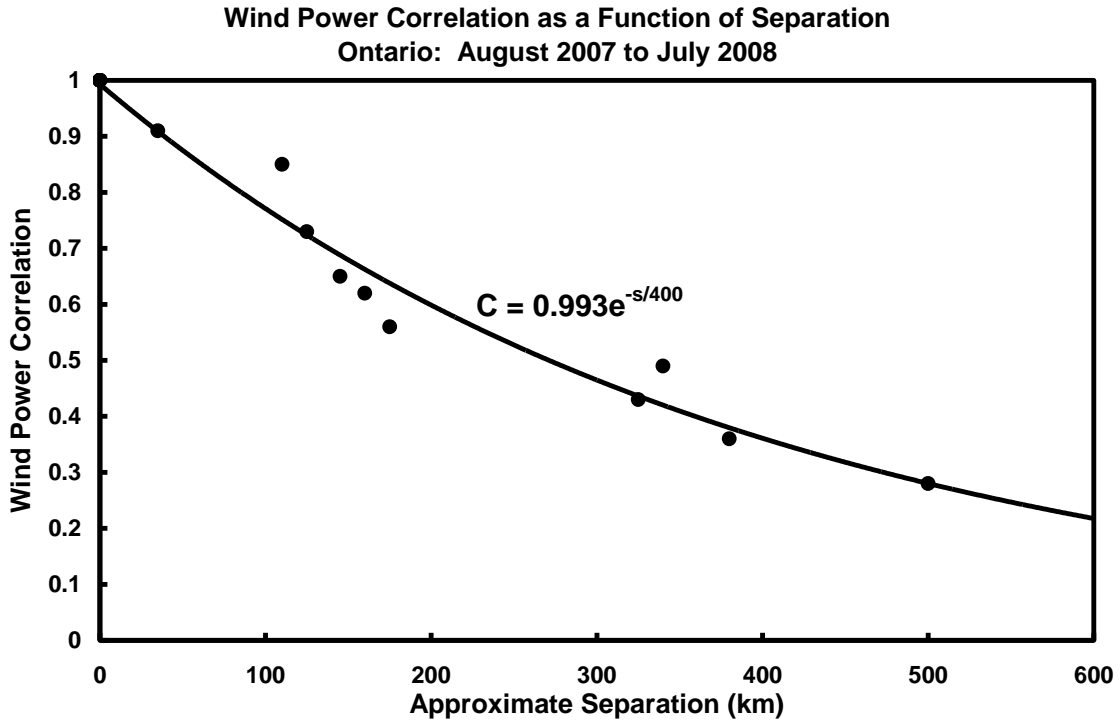


Mr. Whittaker talked of the reliability of wind energy by repeating the CanWEA myth that if the wind is not blowing at one wind farm, it will be blowing at another. This is just not true.

The figure above shows the output of all wind farms in Ontario for the full year July 2009 to June 2010. It is a bar chart of the number of hours during the year for which the power output was in the ranges 0 to 100 MW, 100 to 200 MW, 200 to 300 MW and so on. For instance, the first bar shows that the output was in the range 0 to 100 MW for 2170 hours. The bar chart shows that there is a very wide spread in the output of the total system. Had there been balancing across the system the bar chart would have shown a narrow peak centred on the average for the system of 280 MW.

Wind is not a reliable source of electrical power and therefore needs a switchable reliable back-up source; this is generally gas turbine generation. By the way, Mr. Whittaker claims that T Boone Pickens is one of the biggest supporters of wind energy. This, of course, is because he is in the natural gas business and he knows that wind energy needs natural gas back-up.

For the technically-minded the absence of balancing between the system of wind farms is made more clearly by looking at the correlation between wind farm outputs. This is shown in the next figure:



It is the correlation in the output of two wind farms as a function of distance between them. If the correlation is one, then the wind farms are perfectly in unison. If the correlation is zero, then the wind farm outputs are independent. The analysis shows that wind farms within 200 km are highly correlated while those spaced by more than 500 km are almost independent. For the CanWEA myth to hold water, the correlation needs to be zero for all pairs of wind farms.

Aside from the analysis demonstrated in the two figures, we know very well that there are windy days in Ontario and calm days.

Mr. Whittaker talked of needing only the area of Prince Edward Island to supply 20% of Canada's electrical energy supply with wind power. This is nonsense. Wind turbines leave behind them a turbulent wake. This wake weakens downwind turbines, enhances turbine noise and causes a downwind wind deficit. These things are well known from European research. Recent research from John Hopkins University in the USA recommends a minimum spacing of 15 blade diameters between turbines. In round numbers the spacing needs to be 1.5 km, or at most 0.5 turbines per square km. The Wolfe Island wind farm has a density of just over 1 turbine/sq. km and I know suffers from wind deficit (the downwind turbines turn more slowly). The St. Leon wind farm in Manitoba has a density of about 0.5 turbines per sq. km. For the sake of argument, assume a practical density to be 0.5 turbine/sq. km.

According to NRCan, Canada's electrical power supply in 2008 was about 70 GW. If 20% of this was to be supplied with wind power with a capacity factor of 30%, then it would need 25,000 2 MW turbines. With 0.5 turbine/sq. km, there is the need for 50,000 sq. km, or eight Prince Edward Islands. However, the very concept of an unreliable source of power being able to supply such a large fraction of Canada's electricity is nonsense. An average capacity factor of 30% means that sometimes the system would be producing 5 GW and at other times producing 45 GW. Wind and solar energy can only ever be supplementary sources of power, always needing reliable back-up. Denmark was able to set a goal of 20% because of the short (by Canadian standards) high capacity transmission line between Denmark and Sweden. Much of Denmark's wind-generated electricity is sold to Sweden at a loss!

Cost of Wind Energy

Again, I can address the cost of wind energy only for Ontario. Under the Feed-in Tariff (FIT) program contracts are being signed for on-shore wind energy at \$135/MWh and for off-shore wind energy at \$190/MWh. Neglecting the special bonuses such as the Federal subsidy (\$10/MWh), various tax breaks and the Samsung under-the-table deal these rates can be converted to a carbon tax on electricity consumers for every MWh of coal-generated electrical energy that is replaced by wind generated energy. Given a cost for coal generated electricity of

\$35/MWh, this carbon tax is \$100/MWh for on-shore and \$155/MWh for off-shore.

This tax can be converted into a “carbon cost”. According to the American Physical Society, of which I am a member, a 1000 MW coal plant generates 30,000 tonnes of CO₂ per day. In other words, 0.8 MWh of coal-generated electrical energy produces 1 tonne of CO₂. Therefore the effective carbon cost is the consumer tax on 0.8 MWh, or **\$80/tonne** for on-shore and **\$120/tonne** for off-shore wind-generated electrical energy. These numbers are under-estimates because, as your committee is well aware, wind energy is intermittent and needs gas-turbine generation plants to be running in stand-by mode.

These carbon costs should be compared with \$20/tonne under the European emission trading scheme and about \$20/tonne under the United Nations cap-and-trade scheme. As more wind energy is added to the mix in Canada, the carbon costs are going to doom the competitiveness of Canadian industry.

Mr. Whittaker claims that the \$10/MWh federal ecoENERGY subsidy is equivalent to a carbon price of \$40 to \$50/tonne. As seen from the previous paragraphs, the \$10/MWh subsidy is in fact equivalent to a carbon cost of \$8/tonne.

As an aside, the FIT programme for photo-voltaic solar-generated electrical energy is even more irresponsible: \$300/tonne for large scale projects and well over \$500 for small-scale projects.

Cost of the 20% Target

NRCAN has numbers for the electrical supply mix in Canada in 2008. I will use that information for background. The total was about 70 GW with the following mix:

Hydro	Coal	Nuclear	Nat. Gas	Oil	Other Renewables
59.3%	16.5%	15.6%	5.2%	1.9%	1.6%

Since then, there will have been more natural gas and other renewables and less coal. If the other renewables were to be brought up to 20% at the expense of coal and natural gas then the carbon saving would be up to 150 M-tonnes/year. However, as noted above, this could not possibly be done without natural gas back-up. By the way, Mr. Whittaker gives the savings as 17 M-tonnes/year; he even makes mistakes against his best interests!

Given the present cost of installed wind turbines of over \$2M/MW, a capacity factor of 30% and a need for an average of 14GW, the cost would be \$100B in round numbers. Last Fall I learnt from investment bankers that in the present post-recession climate banks need to see 20% of investor’s money up front and that they will lend at 8%. Investors expect a yield of 12%. Now that Ontario is

having cold feet about its Green Energy Act and FIT programme and European countries are turning away from renewable energy and cancelling contracts, I expect that those numbers will need to be increased. At 8% and a 10 year term, the payments to the bank will amount to \$11B/year or \$90/MWh. Add the \$2.5B/year for the investors and we get \$110/MWh. In addition, there is the cost of the natural gas back-up, operation and maintenance, replacement parts and an enormous investment in grid up-grades to deal with the intermittency of wind energy.

It is unlikely that banks would offer a loan period beyond 10 years. Warranties are typically 2 to 5 years. For instance, no bank would make a car loan beyond 5 years with a 5-year warranty on a car. In a 2007 report Power-Gen Worldwide presented an estimate of between \$0.6M and \$1.2M/MW for generator and gearbox replacement over a 20-year period. The banks will want to be long gone before those expenses arise.

While Mr. Whittaker talks of the \$100B (well, he uses \$80B) as an investment, I prefer to think of it as a burden on electricity consumers and a disaster for the future competitiveness of industrial Canada. As any economist will make clear, that \$100B is best left to find its best use in an open market-place. A 20% target is nothing more than a pipe-dream for an industrial lobby group.

Homes Supplied

I have tried to deal with this issue with CanWEA, wind-energy developers, the Ontario Ministry of the Environment, the Ontario Ministry of Energy and Infrastructure and Natural Resources Canada. The calculation is so simple: According to Ontario's Hydro One, the average Ontario home uses 1000 kWh (or 1 MWh) of electrical energy per month (1700 kWh for homes with electrical heating and 850 kWh for those without). A 100 MW wind farm with a 30% capacity factor generates 22,000 MWh/month. Therefore a 100 MW wind farm generates enough power, on average, for 22,000 homes. CanWEA estimates vary from 30,000 to 45,000.

Real Estate Prices

Mr. Whittaker told you that, if anything, real estate prices go up close to a wind farm. There is no basis in fact for that statement. A year or so ago CanWEA commissioned Canning and Simmons to appraise the effect of wind turbines on real estate value. In line with other such reports by wind energy lobbyists, Canning and Simmons attributed any negative aspect of turbines to their visual effect. Therefore, they divided their sample of home sales into two groups, those with a view and those without a view of the turbines. In the flat landscape of the north shore of Lake Erie, that corresponds to homes within and beyond a distance of some 8 km of the wind farm, respectively.

As we know, the real problem with turbines is the noise-driven annoyance and sleep deprivation for those within 1.5 to 2 km of a wind farm. Therefore, less than 10% of the Canning/Simmons “within” area was truly likely to be affected by the turbines. Nevertheless, prices were lower within the large 8 km zone, by about 10%. However, because of the small number of sales the difference was not statistically significant. This allowed CanWEA to conclude that wind farms have no significant effect on house prices. This conclusion has no relevance at all to the real question: What is the effect of wind turbines on the real estate value of homes within a setback of 1.5 to 2 km?

The following comment on the CanWEA-commissioned study is taken from a report by a real-estate professional in South-Western Ontario, Mike McMurray of Royal LePage RCR Realty:

“Chatham – Kent is attempting to position itself as a leader in Ontario’s renewable energy sector. I understand that at present there are 229 turbines operating or approved in the region..

In working through this study we find the same problem as with the U.S. one; namely that no consideration is given to the nature of the real estate market in the area. Who is the most likely buyer, what are they looking for in the way of property and lifestyle; do they really want to be surrounded by or in close proximity to huge turbines and a sea of flashing lights at night? What is the true effect on property values? I don’t believe that there are any valid studies on the effect on property values but there are definite instances where negative effects have been experienced.

The fact is that we are already experiencing some effect in parts of Grey County just from the threat of this development and this may also be the case in parts of Bruce. As soon as an option agreement has been signed, this fact has to be disclosed to a potential buyer. This creates uncertainty and that is one of the most negative forces affecting sales and values. I can give you one example of an evaluation on a parcel of land in West Grey. An evaluation was made without knowledge that the owner had signed an option and it was estimated at \$125,000. A second evaluation was made (estate property) but this time there was full knowledge of the signing of the option and it was estimated at \$75,000. That represents a 40% drop in estimated market value because of that uncertainty.”

Perhaps the most comprehensive review of the devaluation of real estate property in the vicinity of wind turbines is that published by Appraisal Group One in 2009.

<http://www.wind-watch.org/docviewer.php?doc=AGO-WIND-TURBINE-IMPACT-STUDY.pdf>

Impact on Birds and Bats

Mr. Whittaker pointed out that 20 years ago they used to put turbines on migratory routes. "We've learned since then." Some hope! The Wolfe Island wind farm, brought online in 2009, is on an important migratory pathway. Wolfe Island is designated an Important Bird Area (IBA). You are perhaps aware of the very negative publicity attracted by the wind energy industry over the initial report on the bird and bat kill on Wolfe Island. The full year bird and bat mortality report for Wolfe Island has now been released. The bird mortality rate was 13.4 per turbine-year, far in excess of the one or two on average that Mr. Whittaker told the Committee about! The Windstream wind farm, recently awarded a contract as the first off-shore project for Ontario, is on the same pathway. Algonquin Power is proposing to build on Amherst Island, another IBA. Prince Edward County has several projects in the planning process or already approved. There is an even stronger situation for the migratory pathways across Lake Erie. Not one wind farm in Ontario has been subject to a full Environmental Review. What does he hope to achieve by deluding you!

He told you that among the strongest supporters of wind energy is the Audubon Society. The Audubon Society is far too responsible to leave it at that. Please bear with me while I provide some quotes. The full text in each case can be seen by following the links.

The Audubon Statement on Wind Energy:

"On balance, Audubon strongly supports wind power as a clean alternative energy source that reduces the threat of global warming. Location, however, is important. Many National Audubon Society Chapters and State Programs are actively involved in wind-power siting issues in their communities. Each project has a unique set of circumstances and should be evaluated on its own merits."

<http://policy.audubon.org/audubon-statement-wind-power>

From Audubon Pennsylvania:

"Audubon Pennsylvania advocates the protection of un-fragmented forests, Important Bird Areas (IBAs), areas supporting federally and state Threatened and Endangered species, and Landscape Conservation Areas. More appropriate turbine sites would be post-industrial (brownfield) sites, away from major migratory corridors. We seek to minimize fragmentation of intact forest blocks, as PA currently supports large breeding populations of forest birds. The fragmentation of large forest blocks is listed as a bird population stressor in many of our IBA conservation. Siting wind turbines on "brownfields" (post-industrial sites) rather than large, intact forest blocks would minimize such fragmentation and reduce impacts."

http://pa.audubon.org/news_20060119.html

From New Hampshire Audubon Society:

"New Hampshire Audubon supports appropriately sited wind turbines as one component of New Hampshire's renewable energy portfolio. We consider

appropriate siting to include avoidance of substantial impacts to sensitive habitats and species of conservation concern. The turbines on Dixville Peak, northern Owlhead Mountain, and especially on Mt. Kelsey fail to meet these criteria.”

http://www.wind-watch.org/documents/wp-content/uploads/090227nh_audubon_letter.pdf

From California Audubon Society:

“While Audubon California has been supportive of state and federal efforts to expand renewable energy development – including wind energy – we have advocated strongly that these resources must be properly planned and sited to minimize impacts on birds. These efforts have included the sharing of Important Bird Area maps with planning agencies and continued involvement in the designation of wind energy corridors. The risks to birds from the improper planning of renewable energy are well documented. While we all want to move away from fossil fuels, it is vital that we speak up now so that our conversion to renewable energy doesn’t unnecessarily come at the expense of California’s birds.”

<http://ca.audubon.org/wind.php>

From Greater Mohican Audubon Society:

“The Black Swamp Bird Observatory is seeking a three-year moratorium on additional wind turbines within three miles of the Lake Erie Shores in Lucas, Ottawa, Sandusky, and Erie counties until research, including radar studies, on how the turbines affect the lives of nocturnal migrants can be completed. The BSBO has established an online petition, co-sponsored by the Ohio Ornithological Society and Greater Mohican Audubon Society.”

<http://www.wtol.com/global/story.asp?s=13623668>

Canadian nature societies have not been idle. I will add some further quotations:

From **Nature Canada** (Mara Kerry, Director of Conservation) in a letter to the Ontario Power Authority, dated Oct. 15th, 2008:

“Amherst Island is one such IBA. The entire island is internationally recognized as an IBA due to the high numbers of migrating Brant that are found there in the Spring. The variety of habitats on the island also make it a renowned site for a wide variety of other birds including shorebirds (such as Spring-migrating Dunlin), raptors (particularly significant are the island’s wintering concentrations of hawks and owls), and land-birds (such as large concentrations of migrating swallows).”

And later:

“Wind energy must not be produced at the expense of bird populations. These species contribute enormously to our well-being through ecological services they provide such as depredation (e.g. eating defoliating insects or small rodents) or seed distribution, as well as social values and opportunities such as hunting and bird watching that they offer us. Many of the species migrating through Amherst Island are already declining or threatened in response to many other stresses

throughout their ranges. Adding to the cumulative impact is exactly what this type of proposal would do.

Individual turbines and wind farms must not be located in areas with particular significance to congregating, migrating or breeding birds, including Important Bird Areas such as the Amherst Island IBA. Our position to oppose locating wind turbines within IBAs is consistent with that of Bird Life International. It is also supported by the 2006 Environment Canada document prepared by Bird Studies Canada entitled Wind Turbines and Birds: A Guidance Document for Environment Assessment, which stipulates that IBAs be considered areas of “very high” potential site sensitivity in terms of the risk of adverse effects on birds.

Given the above, I urge you to reject the current proposal by Algonquin Power and Gaia Power Inc. to develop a wind project at the Amherst Island Important Bird Area. In your consideration of this matter, I would welcome the opportunity to provide you with additional information on Nature Canada, our Important Bird Area program and our BirdLife partnership, or on the potential wildlife and habitat impacts of wind energy developments including their incompatibility with IBAs. Please do not hesitate to contact me in this regard.”

Letter from **Cataraqui Region Conservation Area** (Mara Shaw, Watershed Management Coordinator) to Mr. John Friberg, Ontario Ministry of Natural Resources, as a response to EBR 011-0907 (Offshore Wind Power: Consideration of Additional Areas to be Removed from Future Development); dated October 13th, 2010:

“Exclusion Specific to Eastern Lake Ontario

On the basis of the recommended exclusion zones above, CRCA staff recommend that the shoals of Eastern Lake Ontario be excluded from offshore wind turbine installation until further studies are conducted and only then if the results indicate that no negative impact would be incurred on the region’s natural heritage.

Staff notes that the proposed location of the Wolfe Island Shoals Wind Project is in the midst of three IBAs: Pigeon Island (ON041) which is globally significant for congregatory species and nationally significant for its colonial water-bird and sea-bird concentrations; Wolfe Island (ON037), which is globally significant for congregatory species and continentally significant for both congregatory species and waterfowl concentrations; and Amherst Island (ON062) which is globally and continentally significant for congregatory species. The impact of off-shore wind turbines on the significant populations of waterfowl and shorebirds, migrating and congregating birds has not been studied in inland waters. Initial results from the terrestrially-based Wolfe Island wind turbines indicate increased bird and bat mortality which has currently only reported results from its first year of monitoring.”

At its 2010 Annual General Meeting, **Ontario Nature** passed the following motion:

“Be it resolved that Ontario Nature – Federation of Ontario Naturalists 1) calls upon the government of Ontario to place a moratorium on wind farm development within 5 km of known significance to migrating birds and National Parks, Provincial Parks, and Important Bird Areas, until multi-year radar studies of bird migration are conducted at proposed development sites; and 2) urges the government to protect these sites from wind farm development if studies determine that they have significant bird migration concentrations, for example of over 100,000 birds in a season or are found to be situated within major migratory pathways.”

The motion was moved by Myrna Wood (Prince Edward County Field Naturalists) and seconded by Erwin Batalla (Kingston Field Naturalists).

Safety

Not discussed during the Senate Committee meeting was the safety of wind turbines. It is a fact that ice, blades and blade fragments have been thrown up to 500 metres. Nevertheless, Ontario is allowing setbacks from lot lines and roads of as little as 80 to 100 metres; the wind industry is taking full advantage of this irresponsible allowance.

Possible Solution

Clearly, Mr. Whittaker and CanWEA are involved in a desperate lobbying effort on behalf of the wind energy industry and have no qualms about bending the truth on a large number of aspects of wind energy. Of concern is that so many within the industry, within government, within the media and within environmental lobbying groups are prepared to accept CanWEA's position without question. In some cases it is through ignorance; in others it is to further their own agenda and monetary reward.

It is perhaps pertinent that I suggest a way forward. I am not a global warming denier although as a scientist I am embarrassed by the political excesses of some climate scientists. Given the supply mix shown on page 8 of this report it is clear that Canada is far ahead of most of the world in the small fraction of fossil fuel used to generate electricity. This, in my view gives us time for developing a rational way forward. I would advocate a carbon tax and then let the market find its own way. This carbon tax should start low, in the range \$10 to \$20/tonne and then gradually be ramped up. It will be effective only if there are no exceptions. As we now know, cap and trade schemes are subject to all sorts of fraud and have no place in a rational and honest economy.

In addition, for wind energy there needs to be much stronger regulation of the environmental and health impacts. The Ontario government has shown that it is incapable of this regulation and incapable of testing compliance. This regulation belongs with the federal government which can bring in the expertise of the scientists and engineers at NRCan and the National Research Council. Ontario

has only the staff members at the Ministries of Natural Resources and of the Environment, beholden to their political masters, and consultants, beholden to the wind industry for their contracts.

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